MARINE ENERGY WALES

MARINE ENERGY TEST AREA (META)

Environmental Impact Assessment: Appendices

Appendix 4.1. - META EIA Scoping Report

EOR0730

Marine Energy Test Area

Rev: 03

November 16, 2018

Marine Energy Wales

Marine Energy Test Area (META)

Environmental Impact Assessment Scoping Report

Date: *16th November 2018*
Revision: *03*






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Marine Energy Wales

Marine Energy Test Area (META)

Environmental Impact Assessment (EIA) Scoping Report

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Non-technical Summary

Marine Energy Wales's (MEW) proposed Marine Energy Testing Area (the META Project) forms part of Pembroke Dock Marine, a £76 million project to develop a world class centre for marine energy development, fabrication, testing and deployment, in Pembrokeshire (http://www.marineenergywales.co.uk/marine-energy-in-wales/projects/pembroke-dock-marine/). It is one of 11 projects included in the Swansea Bay City Deal signed in 2017. The four pillars of the Pembrokeshire Dock Marine Project include:

- The META Project (being developed by MEW);
- Marine Energy Engineering Centre of Excellence (MEECE) (an Offshore Renewable Energy Catapult project);
- Pembroke Portmanaged and operated by Milford Haven Port Authority); and
- Pembrokeshire Demonstration Zone (PDZ) (being developed by WaveHub).

The META Project will support developer testing of marine energy component, sub-assembly, instrumentation and marine renewable devices including trialling installation, retrieval and decommissioning methodologies and operation and management activities. These will be undertaken in a wide range of environmental conditions, thereby de-risking marine energy technology deployment. The META Project sites include sheltered marine environments as well as larger full-scale marine testing areas.

The META Project consist of eight marine test sites within the Milford Haven Waterway and adjacent waters (Figure 1-1). MEW intends to adopt a phased approach to consenting the activities supported at the suite of test sites (Table 1). Five of the META sites (Sites 1 -5) are deemed to have low to negligible impacts on the environment due to their locations, size, nature and scale of activities proposed and are therefore considered to be exempt from the requirements of the Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2017 (EIA Regulations). These are called META Phase 1 Sites. The remaining three sites (Sites 6, 7 and 8 have the potential to have a significant impact on the environment and are therefore subject to the EIA Regulations, and an EIA will be required. These are called Phase 2 sites. The eight META sites and their categorisation as Phase 1 or Phase 2 sites is provided below:

- Phase 1
  - Carr Jetty (Site 1);
  - Mainstay Quay (Site 2);
  - Ferryside (Site 3);
  - Quay 1 (Site 4);
  - Criterion Jetty (Site 5);
- Phase 2
  - Warrior Way (Site 6);
  - Dale Roads (Site 7); and
  - East Pickard Bay (Site 8).

Table 1: Testing activities supported at Phase 1 and 2 sites, META sites scoped into EIA, and topics scoped into EIA for further assessment

Phase	META Site	Name	Activities Supported	Scoped into EIA?	Topics scoped in for further assessment in EIA
1	1	Carr Jetty	Testing of instruments, components and sub-assemblies by way of dip testing; deployment and retrieval methodologies; vessel approach and recovery; H&S procedures; engineering, research and monitoring.	No	N/A
	2	Mainstay Quay		No	
	3	Ferryside		No	
	4	Quay 1		No	
	5	Criterion Jetty	Testing of instruments, components and sub-assemblies by way of dip testing; deployment and retrieval methodologies; vessel approach and recovery.	No	
2	6	Warrior Way	Full-scale micro tidal devices; scaled tidal devices; instruments, component and sub-assemblies; site preparation, decommissioning and salvage operations	Yes	• Coastal Processes, • Intertidal and Subtidal Benthic Ecology, • Fish and Shellfish Ecology, • Marine Mammals, • Marine Ornithology, • Onshore Ecology, • Underwater Noise and Vibration, • Onshore Noise and Vibration, • Commercial Fisheries, • Shipping and Navigation, • Historic Environment, • Marine Archaeology, • Landscape, • Seascape and Visual impact, Socio-economic and Tourism, • Other Users; and • Traffic and Transport
	7	Dale Roads	Scaled and full-scale wave devices	Yes	
	8	East Pickard Bay	Full-scale wave devices, component testing of floating offshore wind technologies.	Yes	

Phase 1 sites will require some consents and/or licences prior to installation and operation, and these will be supported by a supporting environmental report (Table 3-2).

For Phase 2 sites, MEW will undertake an Environmental Impact Assessment (EIA) in support of licence and/or consent applications, and the outcome of the EIA will be contained within an Environmental Statement (ES) which will be submitted in support of Phase 2 licence/consent applications. Licence applications that are considered to be required for activities supported at Phase 2 sites are:

- Marine Licence;
- Marine Works Licence;
- Section 36 Electricity Act Consent; and
- Town and Country Planning Consent.

The current Scoping report seeks agreement with the relevant consenting authorities (via a Scoping Opinion), the scope of the EIA to be undertaken (in accordance with Regulation 13 the Marine Works (EIA) Regulations 2007 (as amended) and under Regulation 15 of the Town and Country Planning (EIA) (Wales) 2017) (henceforth termed the 'EIA Regulations".

The Scoping Report provides a Project Description Envelope (PDE) which clearly describes the location, physical characteristics and outlines the installation and operational phases of the proposed test sites (as required by the EIA Regulations). Based on the PDE, potential environmental impacts of the installation, operation and decommissioning of the META Phase 2 sites are considered and set-out within the report. The identification of impacts within this Scoping Report have been based upon an understanding of the environmental conditions likely to be encountered within the META Project area, utilising information that has been gained from available data sources.

For some identified potential impacts, further assessment through the EIA may be required to determine what the significance of the potential effect on the receptor may be, and these have been identified in the report for further assessment in the EIA (and summarised in Table 1). Other potential impacts have been assessed as not requiring further assessment due to there being no significant effect on the receiving environment, and these are proposed to be scoped out of further assessment through the EIA. These are also identified within the scoping report. A summary of impacts that have been scoped in and out of the META Project can be found in Table 1.

The proposed approach to the EIA for each potential impact identified is set out in the Scoping Report, and proposed mitigation measures that will be adopted as part of the META Project are described. These measures aim to reduce the likelihood of any potential residual impacts. Potential for cumulative impacts with other plans or projects are also described, and the process for assessing cumulative impacts in the EIA is set out in the Scoping Report.

Table of Contents

Non-technical Summary ..... **i**

1.1 Overview 1
1.2 Purpose of Environmental Impact Assessment 3
1.3 Purpose of Scoping 3
1.4 Purpose of this Scoping Report 3
1.5 The Applicant 4
1.6 Statutory Consultation 4

2 The Proposed Development **4**

2.1 Site Selection 4
2.2 Consideration of Alternatives 5
2.3 Screening of Sites for EIA 5
2.4 Draft Project Design Envelope 14

3 Consenting **30**

3.1 Consultation 30
3.2 Planning and Consenting Context 32

4 Approach to EIA **39**

4.1 Legislative Framework 39
4.2 Information Requirements 43
4.3 Key Elements of the Approach to EIA 43

5 Scope of the Assessment **47**

5.1 Work to Inform EIA 47
5.2 Topics Scoped out of the Assessment 48
5.3 Content of the Environmental Statement 50

6 Technical Assessments **52**

6.1 Coastal Processes 52
6.2 Benthic Subtidal and Intertidal Ecology 61
6.3 Fish and Shellfish Ecology 77
6.4 Marine Mammals 87
6.5 Marine Ornithology 97
6.6 Onshore Ecology 103
6.7 Underwater Noise 109
6.8 Onshore Noise and Vibration 111
6.9 Commercial Fisheries 114
6.10 Shipping and Navigation 121
6.11 Historic Environment 129
6.12 Marine Archaeology 136

6.13 Landscape, Seascape and Visual Impact Assessment 142
6.14 Socio-economic and Tourism....149
6.15 Other Users 157
6.16 Traffic and Transport 164
7 Summary....166
7.1 Overview 166
7.2 Consultation 172
7.3 Next Steps 172
8 References 173
8.1 Section 6.1 Coastal Processes....173
8.2 Section 6.2 Benthic Subtidal and Intertidal Ecology 174
8.3 Section 6.3 Fish and Shellfish Ecology....174
8.4 Section 6.4 Marine Mammals....174
8.5 Section 6.5 Marine Ornithology....176
8.6 Section 6.6 Onshore Ecology 176
8.7 Section 6.7 Underwater Noise....177
8.8 Section 6.8 Onshore Noise and Vibration 177
8.9 Section 6.9 Commercial Fisheries 177
8.10 Section 6.10 Shipping and Navigation....177
8.11 Section 6.11 Historic Environment 177
8.12 Section 6.12 Marine Archaeology....178
8.13 Section 6.13 Landscape, Seascape and Visual Assessment 178
8.14 Section 6.14 Socio-economic and Tourism....179
8.15 Section 6.15 Other Users....179
9 Appendices 180
9.1 Appendix 1 – Regulations, Policy Context, and Consenting Context 180
9.2 Appendix 2 - META Phase One Consultation Response from NRW-MLT....194

Table of Figures

Figure 2-1: Proposed META Test Areas 2
Figure 2-1: Location of Warrior Way (Site 6).... 8
Figure 2-2: Location of Dale Roads (Site 7) 10
Figure 2-3: Location of East Pickard Bay (Site 8) 12
Figure 2-4: East Pickard Bay (Site 8) Cable Route Search Area and Options for Potential Temporary Onshore Control Station Location 13
Figure 4-1: The META Sites (Phase 1 and 2) and NRW Water Framework Directive Boundaries....42
Figure 6-1 Coastal Processes Study Area....53
Figure 6-2: Intertidal Habitats at Warrior Way....64

Figure 6-3: Intertidal Habitats at Dale Roads 66
Figure 6-4: Maerl and Seagrass Populations in MHW....67
Figure 6-5: Intertidal Habitats at East Pickard Bay 69
Figure 6-6: Conservation Designations for the META Project 74
Figure 6-7: Spawning grounds within the Milford Haven Waterway....80
Figure 6-8: Nursery grounds within the Milford Haven Waterway....81
Figure 6-9: Marine Mammal Study Area showing a 100 km radius from the centre of MHW and relevant designated sites....88
Figure 6-10: Nature Conservation Designations in Milford Haven Waterway....91
Figure 6-11: Marine Ornithology Study Area....98
Figure 6-12: Conservation Designations within 10 km of the Onshore Ecology Study Area 106
Figure 6-13: Nature Conservation Designations in Milford Haven Waterway....110
Figure 6-14: Commercial Fisheries Study Area with Bivalve Harvesting Areas....115
Figure 6-15: Shipping and Navigation Study Area and Features....122
Figure 6-16: Recreational areas within the Study Area....126
Figure 6-17: Historic archaeology within the Milford Haven 133
Figure 6-18: Marine Archaeology in the Milford Haven Waterway....139
Figure 6-19: Landscape, Seascape and Visual Impact Study Area with 5 km Buffer....143
Figure 6-20: Other Users Study Area 158
Figure 6-21: Recreational Activities in the Study Area....160
Figure 6-22: Onshore META Infrastructure and Cable Route Options....162
Figure 9-1: Milford Haven Waterway Landscape of Outstanding Historic Interest in Wales....193

Table of Tables

Table 2-1: Warrior Way Testing Activity Characteristics....15
Table 2-2: Warrior Way Deployment and Retrieval PDE....16
Table 2-3: Warrior Way Operations and Maintenance PDE 16
Table 2-4: Dale Roads Testing Activity Characteristics 18
Table 2-5: Dale Roads Deployment and Retrieval PDE....19
Table 2-6: Dale Roads Operations and Maintenance PDE....19
Table 2-7: East Pickard Bay Testing Activity Characteristics 21
Table 2-8: East Pickard Bay Deployment and Retrieval PDE....22
Table 2-9: East Pickard Bay Operations and Maintenance PDE....23
Table 2-10: Offshore and Foreshore Cabling....25
Table 2-11: East Pickard Bay Cabling PDE 26
Table 2-12: East Pickard Bay onshore control station infrastructure PDE 28
Table 3-1: Consultation to inform the META Project Consenting Strategy....30

Table 3-2: META Phase 1 and 2 Sites Consenting (and EIA/HRA) Requirements.....35
Table 4-1: Valued Ecological Receptors (VERs) criteria.....45
Table 5-1: Content of the ES.....50
Table 6-1: Impacts Proposed to be Assessed in the Coastal Processes EIA.....57
Table 6-2: Impacts proposed to be scoped out of the coastal processes EIA 60
Table 6-3: Designated Sites and Relevant Qualifying Features for Marine Habitats 70
Table 6-4 Impacts to be Assessed in the Benthic Subtidal and Intertidal Ecology EIA.....75
Table 6-5 Impacts Proposed to be Scoped Out of the Benthic Subtidal and Intertidal Ecology EIA 76
Table 6-6: Finfish species potentially present in the Waterway with specific conservation and or environmental sensitivities. juv. = juvenile, v = vulnerable, nt = near threatened, ce = critically endangered. 83
Table 6-7: Impacts to be assessed in the fish and shellfish EIA.....85
Table 6-8: Impacts proposed to be scoped out of the fish and shellfish EIA.....86
Table 6-9: Designated Sites and Relevant Qualifying Features for Marine Mammals.....92
Table 6-10: Impacts to be assessed in the Marine Mammal EIA 93
Table 6-11: Impacts proposed to be Scoped out of Marine Mammal EIA.....95
Table 6-12: Sound noise levels for offshore operations 96
Table 6-13: Designated Sites and Relevant Qualifying Features for Marine Ornithology.....100
Table 6-14: Impacts to be assessed in the Marine Ornithology EIA 101
Table 6-15 Impacts Proposed to be Scoped out of Marine Ornithology EIA.....102
Table 6-16: International and National Designated Sites within 10 km of the Study Area 104
Table 6-17: Impacts to be assessed in the Onshore Ecology EIA.....107
Table 6-18: Impacts proposed to be scoped out of the Onshore Ecology EIA.....108
Table 6-19: Summary of landings in 2006 (Cefas, 2006) 117
Table 6-20: Impacts to be assessed in the Commercial Fisheries EIA.....119
Table 6-21: Impacts proposed to be scoped out of the commercial fisheries EIA 120
Table 6-22: Shipping and Navigation baseline data sources 123
Table 6-23: Impacts to be assessed in the Shipping and navigation EIA.....127
Table 6-24: Impacts proposed to be scoped out of the navigation and shipping EIA.....128
Table 6-25: Impacts to be assessed in the Historic Environment EIA 134
Table 6-26: Impacts proposed to be scoped out of the Historic Environment EIA.....135
Table 6-27: Impacts to be assessed in the Marine Archaeology EIA.....141
Table 6-28: Impacts to be assessed in the landscape, seascape and visual impact EIA.....147
Table 6-29: Impacts proposed to be scoped out of the landscape and seascape visual EIA.....149
Table 6-30: Socio-economic and tourism baseline measures and data source 151
Table 6-31: Impacts to be assessed in the Socio-Economic EIA 152
Table 7-1: Summary of Impacts Scoped in and out of the META Project EIA.....167

1.1 Overview

This Environmental Impact Assessment (EIA) Scoping Report has been prepared by RPS Energy on behalf of Marine Energy Wales (MEW). MEW aim to provide a suite of offshore marine energy test sites within, and in proximity to, Milford Haven Waterway (the waterway), to facilitate the testing and development of marine energy projects. This proposal, known as the Marine Energy Test Areas Project (the META Project) will provide marine renewable energy device developers with pre-consented testing sites, which will reduce the consenting burden on device developers. META's aim is therefore to provide a series of pre-consented, non-grid connected, marine energy test areas that will allow for the deployment and testing of devices, components and subassemblies, and ancillary activities and equipment, in support of marine energy testing. Thereby de-risking marine energy projects prior to larger scale or array deployments.

The proposed development falls under Section 3 – Energy Industry of Schedule 2 of The Marine Works (EIA) Regulations (2007) (as amended). Schedule 2 projects include 3a *"industrial installations to produce electricity... where the area of the development exceeds 0.5Ha*", and 3c *"installation for hydroelectric energy production… is designed to produce more than 0.5 megawatts (MW)"* (see Section 4.2). When screening Schedule 2 projects, the appropriate authority must consider the size, nature and location of the proposed works in determining if it will have a significant effect on the environment. In reaching a conclusion, the appropriate authority must have regard to the criteria set out in Schedule 1.

A total of eight areas were identified as potentially suitable META project sites by MEW (see Section 2.2 – *META Site Feasibility Selection Report*). Three of these test areas are considered to have the potential to have significant effects on the environment by virtue of their size, nature of the proposed activities, and sensitivity of the location (Figure 1-1). The five remaining test areas are considered not to have the potential to have a significant effect on the receiving environment due to the nature of the activities proposed (very low potential environmental impact and restricted in duration and scale), their limited size (between 0.36 Ha and 0.71 Ha), and their location (outside of any sites which have been designated for environmental interest). Further details on the screening of sites for inclusion in the EIA are provided in Section 2.3.

A META Phase One Technical Note was submitted to the following organisations to provide the evidence-base to agree planning and consenting requirement for Phase One sites/activities and to support screening out five of the eight identified META Project sites from requiring EIA:

- Milford Haven Port Authority (MHPA);
- Natural Resources Wales – Marine Licensing Team (NRW-MLT); and
- Pembrokeshire County Council (PCC).

NRW-MLT (Zoe McMellin – 22nd October 2018) has responded to this META Phase One Technical Note (see Appendix 2) and confirmed that META Phase 1 Sites (Sites 1 – 5; see Figure 1-1) require a Band 2 Marine Licence, therefore the inference is that they do not require EIA, as projects/plans that require EIA are categorised as Band 3 Marine Licence applications.

An Environmental Statement (ES) will accompany the planning and marine licence applications for three out of eight of the proposed META sites (Site 6 – Warrior Way, Site 7 - Dale Road and Site 8 - East Pickard Bay; see Figure 1-1). This report sets out the proposed scope of the ES that will be prepared in accordance with the EIA Regulations.

The aim of this report is to provide information on the Phase 2 sites to the appropriate Regulatory Authorities to enable EIA Scoping Opinions to be made under Regulation 13 the Marine Works (EIA) Regulations 2007 (as amended) and under Regulation 15 of the Town and Country Planning (EIA) (Wales) 2017.

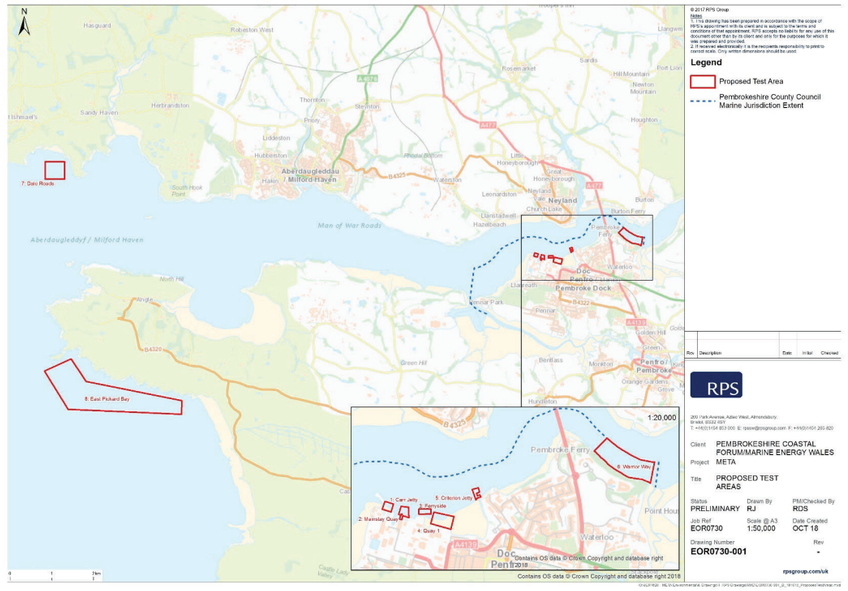

Figure 2-1: Proposed META Test Areas

1.2 Purpose of Environmental Impact Assessment

EIA is the process of identifying and assessing the significant effects on the receiving environment likely to arise from a proposed development. This requires consideration of the likely changes to the environment as a result of the proposed development, through comparison with the existing and likely future baseline conditions in the absence of the proposed development.

1.3 Purpose of Scoping

The process of identifying the issues to consider within an ES (establishing the scope of the assessment) is known as scoping. Scoping is not a mandatory requirement under the EIA Regulations, however it is recognised as a useful part of the assessment process that helps to identify the main effects that a project is likely to have on the environment.

Through the scoping exercise, the key environmental issues requiring further assessment are identified at an early stage, which permits subsequent assessment (EIA) to concentrate on those environmental topics for which significant effects may arise as a result of a proposed development. The scoping of an ES is therefore an important preliminary procedure which sets the context for the subsequent EIA study.

1.4 Purpose of this Scoping Report

This Scoping Report is intended to support engagement with relevant Regulatory Authorities and their statutory consultees on the META Project in relation to the EIA process, and in this regard invites feedback from all parties. The relevant Regulatory Authorities for META sites where EIA is required to support licence applications are:

- MHPA;
- NRW-MLT;
- Pembrokeshire Coast National Park Authority (PCNPA);
- PCC; and
- Marine Management Organisation (MMO).

Details of the consent or licence over which each of these organisations has remit is described in Section 3.

The intention of this Scoping Report is to gain feedback from the above Regulatory Authorities and their consultees regarding the proposed methodology and scope of the EIA which will be submitted to support the consent/licence applications to these Regulatory Authorities.

This Scoping Report has been informed by the:

- META Consenting Strategy;
- META Draft Project Design Envelope (PDE);
- META Site Feasibility Selection Report;
- Stakeholder consultation with:
  - Marine Renewable Device Developers;
  - Department for Business, Energy, and Industrial Strategy (BEIS);
  - MHPA;
  - NRW-MLT;
  - NRW-Advisory;
  - MMO;
  - PCC;

  - PCNPA; and
  - The Crown Estate (TCE);
- Desktop studies, site visits and surveys;
- Review of relevant websites;
- Relevant national and local planning policy;
- Relevant marine policy and guidance;
- EIA Regulations and EIA good practice guidance;
- Experience of consenting of similar test facilities; and
- Experience of other similar developments in a similar geographic area i.e. Pembroke Dock Marine – Pembroke Port redevelopment.

1.5 The Applicant

The applicant (MEW) is an initiative set up and managed by Pembrokeshire Coastal Forum (PCF). It is a leading organisation in the Welsh marine energy industry with membership including worldwide technology developers, key stakeholders and supply chain companies. MEW members have highlighted the importance of a device/component testing area within the Milford Haven Waterway and adjacent waters, as a step to de-risking larger scale marine energy deployments and to speed up the time to commercialisation of technology. This has led to the development of the META project.

1.6 Statutory Consultation

As part of the consultation process, the applicant will continue to actively engage with, and inform, the local community about the META project, to explain the development and its likely effects, and to take on board any concerns or issues. This will include the statutory publication of the regulatory application and ES in accordance with Section 16 of the Marine Works Licence (EIA) Regulations 2007 (as amended) (hereafter referred to as the EIA Regulations) and Section 12 of the Town and Country Planning (Development Management Procedure) (Wales) Order 2012 (as amended); and the statutory requirement to carry out pre-application public consultation in accordance with Section 17 of the Planning Wales Act 2015.

In addition, under Section 14 of the Town and Country Planning (Development Management Procedure) (Wales) Order 2012 (as amended) there is a statutory requirement for the local planning authority to carry out consultation with the appropriate authority before granting planning permission.

2 The Proposed Development

The proposed META project forms part of Pembroke Dock Marine, a £76 million project to develop a world class centre for marine energy development, fabrication, testing and deployment, in Pembrokeshire (http://www.marineenergywales.co.uk/marine-energy-in-wales/projects/pembroke-dock-marine/). This is one of 11 projects included in the Swansea Bay City Deal signed in 2017. The four pillars of the Pembrokeshire Dock Marine Project include:

- The META Project;
- Marine Energy Engineering Centre of Excellence (MEECE);
- Pembroke Port (as referenced above); and
- Pembrokeshire Demonstration Zone (PDZ).

2.1 Site Selection

An initial site selection study was undertaken by MEW based on resource assessment, constraints analysis and stakeholder engagement. This is described fully in *META Site Feasibility Selection Report – (report 180904)*.

An initial 'testing requirement assessment', based on discussions with developers and subsequent developer feedback, was followed by an operational, physical and environmental constraints assessment. Data on navigation and shipping, industrial activities, bathymetry, and wave and tidal resource, was examined for the operational and physical constraints assessment; and data on environmental designations, marine ecology, landscape and seascape, navigation, marine archaeology and other sea users; were examined for the environmental constraints assessment. This resulted in a suite of 12 potential test sites.

This testing requirement assessment was followed by engagement with the MHPA to further refine the proposed META Project sites. This engagement helped to eliminate a few identified sites and realign others.

Further engagement with technology developers and key statutory stakeholders provided refinement of the testing activities to be supported at each proposed META Project site. Following completion of the process, eight sites were identified for progression (Figure 1-1):

- Carr Jetty (Site 1);
- Mainstay Quay (Site 2);
- Ferryside (Site 3);
- Quay 1 (Site 4);
- Criterion Jetty (Site 5);
- Warrior Way (Site 6);
- Dale Roads (Site 7); and
- East Pickard Bay (Site 8).

2.2 Consideration of Alternatives

The consideration of alternative sites has been carried out in accordance with Section 6 of Schedule 3 of The Marine Works (EIA) Regulations 2007 (as amended) and Section 2 of Schedule 5 of the Town and Country Planning (EIA) (Wales) 2017, which requires the applicant to provide an outline of the main alternatives studied, and an indication of the main reasons for the applicant's choice. Through the site selection process and consideration of alternative sites, the parameters of the META Project have been considered and these have been aligned with the constraints of each site.

Other sites within the Waterway have been considered, however due to technical and consenting factors, these could not be progressed further. Sites outside Pembrokeshire have not been considered as these would not comply with the aims of the strategic Pembroke Dock Marine project.

2.3 Screening of Sites for EIA

2.3.1 META Sites Screened out of the EIA

Whilst a formal EIA Screening Opinion has not been sought from the regulatory authorities, it is inferred from the NRW-MLT response to the META Phase One Technical Note (see Appendix 2) that five of the META Project sites (Phase 1 sites) may be screened out of the requirement for EIA on the basis that the activities proposed at these sites are likely to have a low or negligible environmental impact. In addition, The Marine Work (EIA) Regulations 2017 (as amended) provide an opportunity for the developer to identify those impacts that are likely to have a "significant environmental effect" and that should therefore be considered for further assessment in the EIA report. Phase 1 Sites support the following low impact activities:

- Dip testing of subassemblies, components, monitoring, and research equipment;
- Short duration dip testing of full scale devices;
- Operational testing of instruments, components and subassemblies, monitoring, and research equipment;
- Testing of deployment and retrieval methodologies of subassemblies, components, monitoring, and research equipment;
- Testing of vessel approach and recovery methodologies; and
- Testing of health and safety (H&S) procedures.

Full scale marine energy devices will **not** be supported at these sites and no energy will be generated.

In addition, Phase 1 Sites are:

- Outside of sites designated for environmental interest;
- Are restricted in size; and
- Activities to be carried out are of short duration and restricted in extent.

Taking all of the above into consideration, it is therefore proposed that it can be concluded that activities supported at Phase 1 sites **will not** have a "significant environmental effect" due to their scale, location, nature and extent, and therefore should not be carried forward to EIA as per the Marine Works (EIA) Regulations 2017 (as amended).

Full details of the PDE for these sites is provided in the *META Draft PDE Report (Report 181016)*

The META sites which are proposed to be screened out of the need for EIA based on the above are:

- Carr Jetty (Site 1);
- Mainstay Quay (Site 2);
- Ferryside (Site 3);
- Quay 1 (Site 4); and
- Criterion Jetty Quay (Site 5).

2.3.2 META Sites Screened into the EIA

Whilst a formal EIA Screening Opinion has not been sought from NRW-MLT, three META Project sites (Phase 2 sites) have been screened into the requirement to undertake an EIA, on the basis that the activities proposed at these sites are consistent with the characteristics of a Schedule 2 project under the Marine Works (EIA) Regulations 2007 (as amended). That is, a project which is likely to have significant effects on the environment due to factors such as its size, nature or location. The activities that will be supported at these sites are:

- Scale wave device testing;
- Scale tidal device testing;
- Full scale wave device testing;
- Micro tidal device testing;
- Testing of remotely operated vehicle (ROV) or other monitoring equipment;
- Site preparation methodologies;
- Decommissioning methodologies;
- Salvage methodologies; and
- Tow, float and mooring solution testing for floating offshore wind technology.

The META sites that will support the above testing activities and have therefore been screened into the requirement for EIA are:

- Warrior Way (site 6);
- Dale Roads (site 7); and
- East Pickard Bay (site 8).

To support licence/consent applications for these sites an EIA and shadow Habitats Regulations Assessment (sHRA) (where potential impacts of licensable activities may affect a European site) will be provided. A single EIA will cover both onshore and offshore environmental impacts and will support both marine and terrestrial licence/consent applications. MEW propose to submit separate sHRAs for the onshore and offshore aspects of the META project, and the format of these assessments will be discussed and agreed with the competent authorities. See Section 4.1.2 for approach to the sHRA.

A description of the META Project sites that will be assessed in the EIA is provided below.

Warrior Way (Site 6)

Warrior Way is located within the Waterway offshore from the Pembrokeshire Science and Technology Park, south east of Pembroke Ferry, and at the mouth of the Cosheston Pill. The site supports the greatest tidal resource in the Milford Haven Estuary (1.2 m/s) and has a depth of between 16-19 m. The Warrior Way site encompasses an area of 10,900 m^2 (10.9 Ha) and lies entirely within the Pembrokeshire Marine / Sir Benfro Forol Special Area of Conservation (SAC), in close proximity to habitats identified as "Nationally Important Intertidal Habitats", and immediately adjacent to the Waterway Site of Special Scientific Interest (SSSI) designated for a variety of natural features including, estuaries; marine habitats; species of wildfowl and waders; and Eurasian otter (*Lutra lutra*). Figure 2-1 illustrates the location and extent of Warrior Way (including indicative footprint of infrastructure) in relation to the surrounding Milford Haven and Pembrokeshire infrastructure and environmental designated sites.

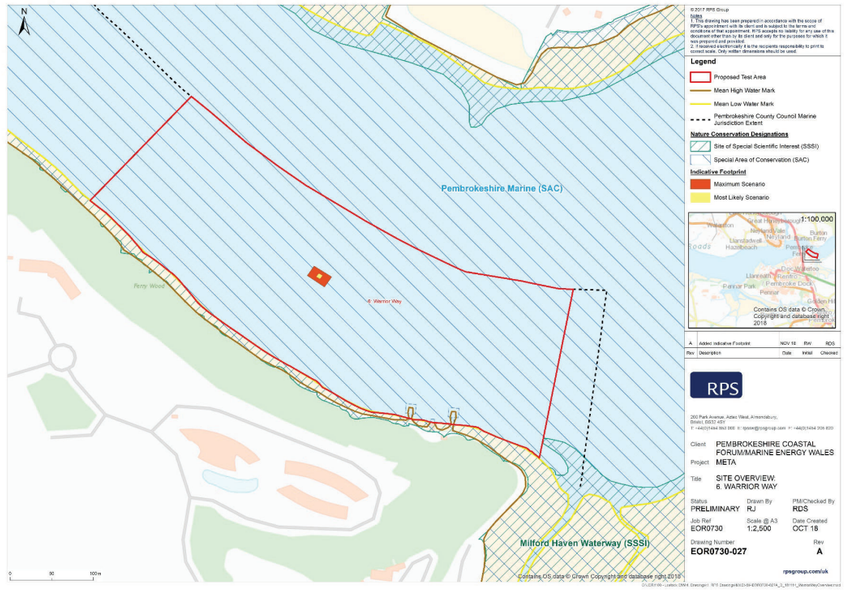

Figure 2-1: Location of Warrior Way (Site 6)

Dale Roads (Site 7)

Dale Roads lies outside the Dale shelf anchorage within the Waterway to the west of Great Castle Head, and south of St Ishmael's. It supports depths of between 8 and 12 m and benefits from a significant wind and wave fetch from the south and southwest. The site encompasses an area of 196,200 m^2 (19.62 Ha) and lies entirely within the Pembrokeshire Marine/ Sir Benfro Forol SAC designated for grey seal (*Halichoerus grypus*), marine habitats, coastal lagoons, submerged or partially submerged sea caves, otter and species of migratory fish, and the West Wales Marine candidate SAC (cSAC) proposed for harbour porpoise (*Phocoena phonoena*). The coast at Dale Roads is part of the Waterway SSSI designated for a variety of natural features including, estuaries, marine habitats, species of wildfowl and waders, and otter. Figure 2-2 illustrates the location and extent of Dale Roads (including indicative footprint of infrastructure) in relation to the surrounding Milford Haven and Pembrokeshire infrastructure and environmental designated sites.

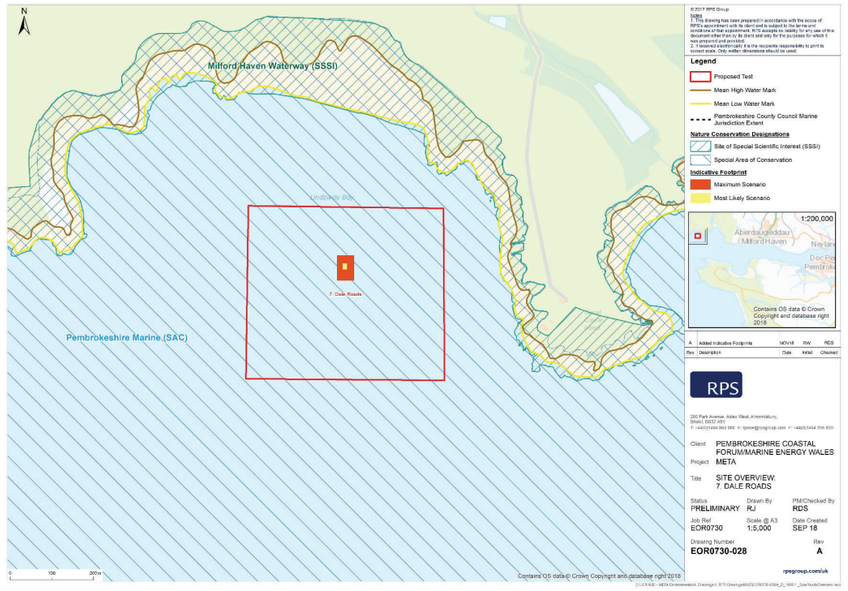

Figure 2-2: Location of Dale Roads (Site 7)

East Pickard Bay (Site 8)

The north-west side of East Pickard Bay overlaps with the southern boundary of the Waterway. It lies immediately south of Sheep Island and runs south-eastward parallel to the coast towards Freshwater West Bay.

The META Project offshore site is exposed to a good wave resource benefiting from a 200 km fetch from the prevailing wind direction and has a water depth of between 10 and 29 m. The East Pickard Bay site encompasses an area of 2,580,000 m^2 (258 Ha) and lies entirely within the Pembrokeshire Marine/ Sir Benfro Forol SAC designated for grey seal, marine habitats, coastal lagoons, submerged or partially submerged sea caves, otter and species of migratory fish, and the West Wales Marine cSAC proposed for harbour porpoise. The Castlemartin Coast Special Protection Area (SPA) lies inland to the north east of the East Pickard Bay site. Figure 2-3 illustrates the location and extent of East Pickard Bay (including indicative footprint of infrastructure) in relation to the surrounding Milford Haven and Pembrokeshire infrastructure and environmental designated sites.

The site also lies adjacent to a Ministry of Defence (MOD) Danger Area.

Associated with the East Pickard Bay offshore testing site, a temporary onshore control station will be provided in support of marine testing activities. A separate temporary consent will be sought for each project deployment requiring an onshore temporary control station. This will be located near to Freshwater West Bay and will be for the control and maintenance of marine testing activities. The Angle Peninsula Coast SSSI encompasses the coast to the west of the temporary onshore control station location Option areas, the Broomhill Burrows and Castlemartin Coast SSSIs overlap with the temporary control station Option 1, and in close proximity to Option 2, the Castlemartin Range SSSI lies to the south-east, adjacent to temporary onshore control station Option 3, and Option 4 lies to the north overlapping with the Angle Peninsula Coast SSSI. The Castlemartin Coast SSSI underpins the Castlemartin Coast SPA and the Limestone Coast of South West Wales SAC. The coastal area of Angle Peninsula also supports the Pembrokeshire National Park, the Pembrokeshire Coast path and the Wales Coast path. Figure 2-4 illustrates the control station location Option areas being considered for META, and the search area for the cable route from the East Pickard Bay META site to these control station location Option areas.

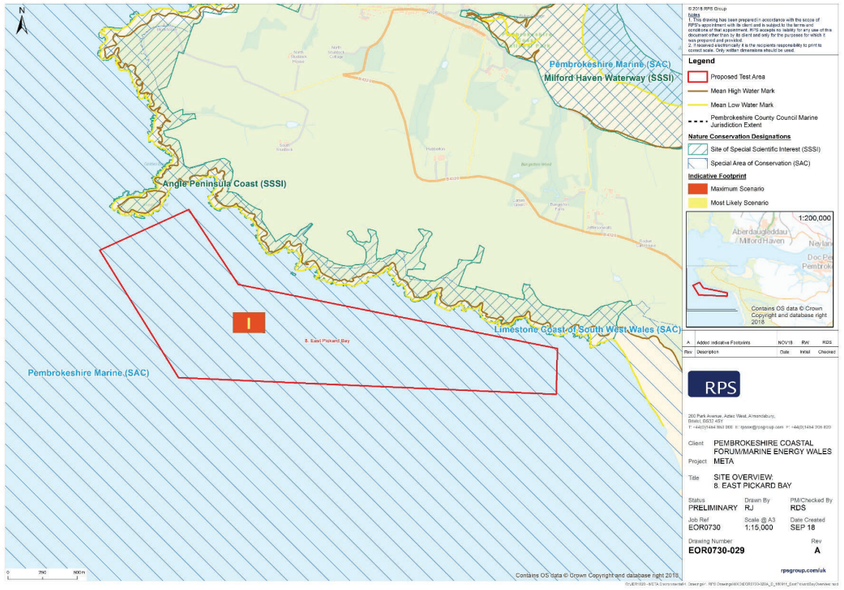

Figure 2-3: Location of East Pickard Bay (Site 8)

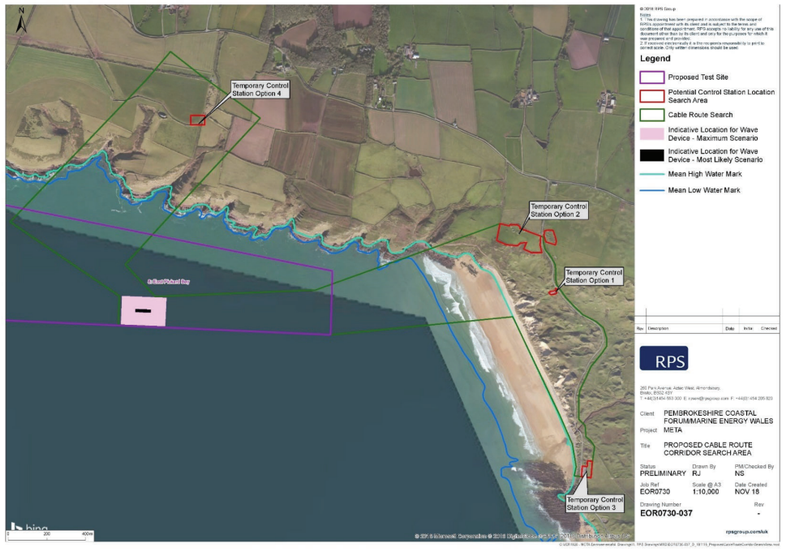

Figure 2-4: East Pickard Bay (Site 8) Cable Route Search Area and Options for Potential Temporary Onshore Control Station Location

2.4 Draft Project Design Envelope

An EIA is required for activities to be enabled at Warrior Way (Site 6), Dale Roads (Site 7) and East Pickard Bay (Site 8), and therefore only activities supported at these sites have been described and assessed in this EIA Scoping Report.

2.4.1 Warrior Way (Site 6)

Warrior Way will enable testing of:

- Scaled tidal devices,
- Micro tidal devices,
- Instruments, components and subassemblies;
- ROV or other monitoring equipment;
- Site preparation methodologies;
- Decommissioning methodologies; and
- Salvage methodologies.

MEW will provide an ADCP and a test support buoy at Warrior Way to support testing at this site.

The site does not however have the capacity or area to support full-scale tidal devices other than micro full-scale devices, (full-scale devices that are designed to be limited in size and generation capacity to allow installation in more restricted depth/area tidal streams or run-of river scenarios), therefore full large scale tidal device deployment will not be supported at Warrior Way.

The maximum testing scenario at Warrior Way is up to two activity tests occurring concurrently within the Warrior Way test site, however it is more likely that Warrior Way will support only single activity testing at any one time.

Devices may be attached to developers' own moorings, deployed on the seabed, or deployed from a floating platform or vessel. There is no proposal to include piling or pin piling at Warrior Way.

Testing may include floating surface structures, surface piercing structures, sub-surface testing and/or seabed mounted structures and devices may yaw according to local current and tidal conditions, as well as movement of large vessels in proximity to the test site, and therefore may experience up to 360° yaw.

Devices for operational testing at Warrior Way are likely to be towed to site and installed on pre-prepared foundations or attached to a floating platform or test support buoy. Vessels used in installation and retrieval operations will be up to 164 m in length and 6.8 m draught as this is the maximum vessel length and draught that can be supported at Pembroke Port.

Energy generation may occur during test deployments at Warrior Way, therefore Warrior Way will be included in the Section 36 (S.36) consent as required under Electricity Act 1989. This S.36 consent will include Warrior Way (Site 6), Dale Roads (Site 7) and East Pickard Bay (Site 8). Generation capacity (up to 10 MW) will be spread between these three sites allowing flexibility in deployment options.

Communication and power to support the tests proposed will be provided locally at Warrior Way as and when necessary; this will not require the installation of any permanent infrastructure to support the testing. Similarly, a grid emulation system may be provided at Warrior Way on a project-by-project basis and will not require the installation of any permanent infrastructure.

Operational testing at Warrior Way may be throughout the year (will not be seasonally restricted) and will not be restricted to daylight hours, however deployment and retrieval, and maintenance activities will be restricted to daylight hours. Operational procedures will be detailed in Risk

Assessment Method Statements (RAMS) that will be submitted as supporting documentation to project specific deployments.

Warrior Way will be demarked by up to four navigational marker buoys which will be of standard design. Consultation with the Maritime Coastguard Agency (MCA) with regard to navigational marking requirements is on-going.

Table 2-1 below details the proposed maximum and most likely PDE for testing at Warrior Way.

Table 2-1: Warrior Way Testing Activity Characteristics

Project Detail	Maximum Scenario	Most Likely Scenario
Position in water column	Tidal components are likely to occupy all or part of the water-column.	
Dimensions	25 m x 15 m	5 (L); 5 (W)
Rotor Diameter (tidal only)	≤ 10 m	≤ 5 m
Swept area (tidal only)	78.5 m^2	19.63 m^2
Height above surface	< 2 m	minimal/at sea surface
Number of devices/test that can be supported	≤ 2	1
Sea area per device/component	≤ 200 m^2	≤ 100 m^2
Seabed footprint per device/component (where devices or component touches the seabed)	Up to 200 m^2	Up to 100 m^2
Seabed footprint (where devices or component touches the seabed) for multiple activity testing	Up to 400 m^2	Up to 100 m^2
Speed of moving parts	≤ 5 m/s	≤ 2 m/s
Buffer area of seabed clearance required around testing area (where device or component touches the seabed)	5 m strip around device seabed footprint	None required

Project Detail	Maximum Scenario	Most Likely Scenario
Lubricants and antifoulants	Any antifoulants or lubricants used will be EU/Internationally approved for use in marine environments	
Mooring/attachment method	Up to 4 drag anchors with associated slack lines, catenary mooring system. Gravity base may be required at Warrior Way - maximum area up to 25 m^2. No pin piling will be carried out at Warrior Way	Deployed from vessel or attached to test support buoys
Mooring spread per test	150 m^2	50-75 m^2
Mooring spread for multiple activity testing	300 m^2	150 m^2

Deployment and Retrieval

Table 2-2 presents the proposed PDE for deployment and retrieval of devices at Warrior Way.

Table 2-2: Warrior Way Deployment and Retrieval PDE

Project Detail	Maximum Scenario	Most Likely Scenario
No. vessels	Up to 5	Up to 3
Frequency of deployment and retrieval operations in a 12-month period	Up to 20 test deployments and 20 retrieval operations in a 12-month period.	Up to 20 test deployments and 20 retrieval operations in a 12-month period.

Vessels used will have a maximum length of 164 m, and a maximum draught of 6.8 m. This is dictated by the maximum vessel length and draught that can be supported at Pembroke Port.

Operations and Maintenance

Table 2-3 presents the proposed PDE for Operation and Maintenance activities at Warrior Way.

Table 2-3: Warrior Way Operations and Maintenance PDE

Project Detail	Maximum Scenario	Most Likely Scenario
Duration of tow testing activity (estimated % time device in water given in brackets)	3 months (50 %)	≤ 1 month (50 %)
Moored/gravity base deployment duration (estimated % time device in water given in brackets)	3-6 months (100 %)	1-3 months (80 %)

Project Detail	Maximum Scenario	Most Likely Scenario
Frequency of O&M visits	< 104 vessel visits in a 12-month period	< 52 vessel visits in a 12-month period
No. of vessels	≤ 5	≤ 3

2.4.2 Dale Roads (Site 7)

Dale Roads will enable testing of:

- Scaled wave energy converter (WEC) devices;
- Full-scale WEC devices; and
- Research and monitoring methodologies.

The maximum testing scenario at Dale Roads is up to two tests occurring concurrently within the test site area, however it is more likely that Dale Roads will support only single testing at any one time.

Devices may be attached to developers' own moorings, deployed on the seabed, or deployed from a floating platform, vessel or test support buoy. MEW will provide an ADCP, a wave buoy or similar technology, and a test support buoy to support testing activities at Dale Roads. Drilled pin piling may be required to support test deployments at Dale Roads, therefore further details of pin piling are provided below in Table 2-4.

Testing may include floating surface structures, surface piercing structures, sub-surface testing and/or seabed mounted structures, and devices may yaw according to local current and tidal conditions, as well as movement of large vessels in proximity to the test site, and therefore may experience up to 360° yaw.

Devices for operational testing at Dale Roads are likely to be towed to site and installed on pre-prepared foundations or attached to META test support buoys. Vessels used in installation and retrieval operations will be up to 164 m in length and 6.8 m draught as this is the maximum vessel length and draught that can be supported at Pembroke Port. Noise emissions from vessels and operational devices and test will be minimal, and not above background noise levels already occurring in the Waterway.

Energy generation may occur during test deployments at Dale Roads, therefore Dale Roads will be included in the S.36 consent as required under Electricity Act 1989. This S.36 consent will include Warrior Way (Site 6), Dale Roads (Site 7) and East Pickard Bay (Site 8). Generation capacity (up to 10 MW) will be spread between these three sites allowing flexibility in deployment options.

Communication and power to support the tests proposed will be provided locally at Dale Roads as and when necessary and will not require the installation of any permanent infrastructure to support the testing. Similarly, a test-support buoy capable of dissipating energy at site will be provided at Dale Roads but will not require the installation of any permanent infrastructure.

Operational testing at Dale Roads may be throughout the year (will not be seasonally restricted) and will not be restricted to daylight hours, however deployment and retrieval, and maintenance activities will be restricted to daylight hours. Operational procedures will be detailed in RAMS that will be submitted as supporting documentation to project specific deployments.

Dale Roads will be demarked by up to four navigational marker buoys which will be of standard design.

Table 2-4 below details the proposed maximum and most likely PDE for testing at Dale Roads.

Table 2-4: Dale Roads Testing Activity Characteristics

Project Detail	Maximum Scenario	Most Likely Scenario
Position in water column	Wave component testing may occupy a significant proportion of the water column and may include surface-piercing.	
Dimensions	60 m (L) x 40 m (W)	15 m (L) x 10 m (W)
Height above surface	2 m	At sea surface
Number of testing activities	2	1
Seabed footprint per device/component (where devices or component touches the seabed)	Up to 2,400 m^2	<200 m^2
Seabed footprint (where devices or component touches the seabed) for multiple activity testing	Up to 4,800 m^2	<400 m^2
Buffer area of seabed clearance required around testing area (where device or component touches the seabed)	5 m strip around device seabed footprint	None required
Pin piles	≤ 4 drilled pin piles per device. Each pin pile up to 100 mm diameter installed to a depth of 10 – 20 m.	No pin pilling required
Lubricants and antifoulants	Any antifoulants or lubricants used will be EU/Internationally approved for use in marine environments.	
Mooring/attachment method	Up to 10 drag anchors with associated slack lines, catenary mooring system. Gravity base may be required at Dale Roads - maximum area up to 500 m^2. Pin piling (drilled) may be	Dynamic tether mooring system or up to 4 standard drag embedment anchors. Gravity base up to 75 m^2. No pin piling.

Project Detail	Maximum Scenario	Most Likely Scenario
	required at Dale Roads (see above).	
Mooring spread per test activity	200 x 200 m (40,000 m^2)	50 x 50 m (2,500 m^2)
Total mooring spread for multiple testing activities	400 x 400 m (160,000 m^2)	100 x 100 m (10,000 m^2)

Pin Piling

As pin piling has the potential to introduce increased levels of anthropogenic sound in to the marine environment, further details are provided here.

The maximum diameter of the pin piles to be installed will be 100 mm. Piles will be drilled only and will be piled to between 10 m and 20 m below the sea bed.

Deployment and Retrieval

Table 2-5 presents the proposed PDE for deployment and retrieval of devices at Dale Roads.

Table 2-5: Dale Roads Deployment and Retrieval PDE

Project Detail	Maximum Scenario	Most Likely Scenario
No. of vessels	≤ 5	≤ 3
Frequency of deployment and retrieval operations in a 12-month period, per site	≤ 20 test deployments and 20 retrieval operations in a 12-month period.	≤ 20 test deployments and 20 retrieval operations in a 12-month period.

Vessels used will have a maximum length of 164 m, and a maximum draught of 6.8 m. This is dictated by the maximum vessel length and draught that can be supported at Pembroke Port.

Operations and Maintenance

Table 2-6 presents the proposed PDE for Operation and Maintenance activities at Dale Roads.

Table 2-6: Dale Roads Operations and Maintenance PDE

Project Detail	Maximum Scenario	Most Likely Scenario
Duration of tow testing activity (estimated % time device in water given in brackets)	3 months (50 %)	≤ 1 month (50 %)
Moored/gravity base deployment duration (estimated % time device in water given in brackets)	3-12 months (100 %)	6-12 months (80 %)

Project Detail	Maximum Scenario	Most Likely Scenario
Frequency of O&M visits	104 vessel visits in a 12-month period	1 visit weekly
No. of vessels	≤ 5	≤ 3

2.4.3 East Pickard Bay (Site 8)

East Pickard Bay will enable:

- Full-scale WEC device testing;
- Scaled WEC device testing; and
- Component testing for floating offshore wind technology.

Energy generation may occur during test deployments at East Pickard Bay, therefore East Pickard Bay will be included in the Phase 2 S.36 consent as required under Electricity Act 1989. This S.36 consent will include Warrior Way (Site 6), Dale Roads (Site 7) and East Pickard Bay (Site 8). Generation capacity (up to 10 MW) will be spread between these three sites allowing flexibility in deployment options.

Eat Pickard Bay may support testing of more than one activity or device at any one time. The maximum testing scenario at East Pickard Bay is up to two testing activities/device deployments at any one time. The most likely testing scenario is single activity/device deployment testing at any one time.

Devices may be attached to developers' own moorings, deployed on the seabed, or deployed from a floating platform or vessel. Ongoing resource monitoring will be undertaken at the site using ADCPs and Waverider Buoys. Relevant consents and permissions for these deployments will be secured separately. A test support buoy capable of dissipating energy at site may be deployed at East Pickard Bay for some periods but will not require the installation of any long-term infrastructure. Pin piling may be required at East Pickard Bay therefore details of the installation process for pin-piling is outlined after Table 2-7.

Testing may include floating surface structures, surface piercing structures, sub-surface testing and/or seabed mounted structures, and devices may yaw according to local current and tidal conditions and therefore may experience up to 360° yaw.

Devices for operational testing at East Pickard Bay are likely to be towed to site and installed on pre-prepared foundations or attached to the test support buoys. Vessels used in installation and retrieval operations will be up to 200 m in length and 8 m draught as this is the maximum vessel length and draught that can be supported at local ports. Noise emissions from vessels and operational devices and test will be minimal, and not above background noise levels already occurring in the Waterway.

A test support buoy capable of dissipating energy at site will be provided at East Pickard Bay but will not require the installation of any long-term infrastructure.

Devices may remain installed at East Pickard Bay throughout the year (will not be seasonally restricted) and will not be restricted to daylight hours, however installation, deployment and retrieval, and maintenance activities will be restricted to daylight hours. Operational procedures will be detailed in RAMS that will be submitted as supporting documentation to project specific deployments.

Advice will be sought from the MCA with regards to navigational marking requirements for the East Pickard Bay site.

Table 2-7: East Pickard Bay Testing Activity Characteristics

Project Detail	Maximum Scenario	Most Likely Scenario
Position in water column	Wave device testing may occupy a significant proportion of the water column and may include surface-piercing, at surface and sub-surface components.	
Dimensions	147 m (L) x 230 m (W)	80 m (L) x 17 m (W)
Height above surface	≤ 5 m	Minimal/at sea surface
Number of devices	2	1
Seabed footprint per device/component (where devices or component touches the seabed)	Up to 8,000 m^2	1,700 m^2
Seabed footprint (where devices or component touches the seabed) for multiple activity testing	10,250 m^2	3,400 m^2
Sea surface area required for testing (m^2)	360,000 m^2	100 m^2
Buffer area of seabed clearance required around testing area (where device or component touches the seabed)	10 m strip around device seabed footprint.	None required
Pin piles	Up to 4 drilled pin piles per device. Each pin pile up to 100 mm diameter installed to a depth of 10 – 20 m.	No pin pilling required
Lubricants and antifoulants	Any antifoulants or lubricants used will be EU/Internationally approved for use in marine environments	
Mooring/Attachment method	Up to 3-point catenary mooring system (120° separation) or up to 10 standard drag embedment anchors. Gravity base may be required at East Pickard Bay -	• Dynamic tether mooring system;

Project Detail	Maximum Scenario	Most Likely Scenario
	maximum area up to 1125 m^2. Pin piling may be required at East Pickard Bay (see above details below).	• Up to 4 standard drag embedment anchors. • Gravity base up to 1125 m^2. • No pin piling.
Mooring spread per test activity[1]	500 m x 500 m (250,000 m^2)	25 x 25 m (625 m^2)
Total mooring spread for multiple testing activities	500,000 m^2	50,000 m^2

Pin Piling and Rock Ballasting

As pin piling and rock-ballasting have the potential to introduce increased levels of anthropogenic sound in to the marine environment, further details are provided here.

Pin Piling

The maximum diameter of the pin piles to be installed will be 100 mm. Piles will be drilled only and will be piled to between 10 m and 20 m below the sea bed.

Rock Ballasting

Rock ballasting may be required for scour protection/moorings of devices in the East Pickard Bay Site. Rocks will be contained in bags and will be removed at the end of the testing period, unless leaving in situ is preferred. Each rock back may contain up to 5 tonnes of rock and may have a diameter of up to 2 m. For the most likely scenario (dimensions) this would equate to 100 rock bags which is equivalent to 500 tonnes. It would take up to 5 days to deploy this volume of rock.

Deployment and Retrieval

Table 2-8 presents the proposed PDE for deployment and retrieval of devices at East Pickard Bay.

Table 2-8: East Pickard Bay Deployment and Retrieval PDE

Project Detail	Maximum Scenario	Most Likely Scenario
No. of vessels	≤ 5	≤ 3
Frequency of deployment and retrieval operations in a 12-month period	≤ 20 test deployments and 20 retrieval operations in a 12-month period.	≤ 20 test deployments and 20 retrieval operations in a 12-month period.

[1] Maximum mooring spread is provided; however, this allows for up to 6 moorings within the larger area and each mooring itself may be a small area of the total mooring spread area.

Project Detail	Maximum Scenario	Most Likely Scenario
Mooring spread if required for deployment and retrieval[1]	400 m x 300 m (120,000 m^2)	350 m x 200 m (70,000 m^2)

Vessels used will have a maximum length of 200 m, and a maximum draught of 8 m. This is dictated by the maximum vessel length and draught that can be supported at local ports.

Operations and Maintenance

Table 2-9 presents the proposed PDE for Operation and Maintenance activities at the East Pickard Bay site.

Table 2-9: East Pickard Bay Operations and Maintenance PDE

Project Detail	Maximum Scenario	Most Likely Scenario
Duration of tow testing activity (estimated % time device in water given in brackets)	≤ 3 months (50%)	≤ 1 month (50%)
Moored/gravity base deployment duration (estimated % time device in water given in brackets)	12-18 months (100%)	6-12 months (80%)
Frequency of O&M visits	150 vessel visits in a 12-month period	104 vessel visits in a 12-month period
No. of vessels	≤ 5	≤ 3

Vessels used will have a maximum length of 200 m, and a maximum draught of 8 m. This is dictated by the maximum vessel length and draught that can be supported at local ports.

Onshore Infrastructure and Cabling

Communication, air and power to support testing at East Pickard Bay will be provided by means of a marine cable to shore to associated temporary onshore infrastructure. A separate temporary consent will be sought for each project deployment requiring an onshore temporary control station. This will be located near to Freshwater West beach, West Pickard Bay or East Pickard Bay, and will be for the control and maintenance of marine testing activities (Figure 2-4). The Broomhill Burrows and Castlemartin Coast SSSI overlaps with the temporary control station Option 1 and is near to the temporary control station Option 2. The Castlemartin Range SSSI lies to the south east, adjacent to temporary control station Option 3. Option 4 extends north of the marine testing area and lies within the Angle Peninsula Coast SSSI. The Castlemartin Coast SSSI underpins the Castlemartin Coast SPA and the Limestone Coast of South West Wales/ Arfordir Calchfaen de Orllewin Cymru SAC. The coastal area of Angle Peninsula also supports the Pembrokeshire Coast National Park, the Pembrokeshire Coast path and the Wales Coast path.

These four potential options for location of the temporary control station have been identified based on:

- Technical suitability;

- Suitability for developer site access
- Minimising visual impact; and
- Minimising environmental impact.

Figure 2-4 illustrates the 'Cable Route Search Area' (dark green line) and proposed options for locating the temporary control station (red line). Table 2-10 summarises the onshore cable route options and temporary control station options that are being considered.

Cabling

A cable will be run directly to shore from the offshore test area in East Pickard Bay. For the route to Freshwater beach (Options 1-3) it is necessary to route the cable perpendicular to the incident waves for protection in shallower waters (e.g. 5 m depth or less), and perpendicular to the depth contours of the sea bed. The route to East Pickard Bay/West Pickard Bay will use natural rock channels for protection. These cable route options search areas are shown by the dark green outline "Cable Route Search Area" in Figure 2-4. Table 2-10 summarises the approximate total cable lengths between the offshore device testing area, and the onshore temporary control station for the four location options considered. Table 2-10 also provides details of the approximate length of cabling in the offshore (below Mean Low Water Spring (MLWS)), foreshore (between MLWS and Mean High Water Spring (MHWS) and onshore (above MHWS) sections of the cable routing.

Offshore and Foreshore Cabling

Temporary control station Options 1 - 3

The cable will be laid on the seabed (with associated anchoring weights) from the East Pickard Bay offshore test area to an anchor point 50 m from the point of MLWS. Between MLWS and MHWS, the cable will be trenched through the mobile beach sediment. This will be trenched in a direction and location to afford maximum protection during winter storm events.

Temporary control station Option 4

The cable will be laid on the seabed (with associated anchoring weights) from the East Pickard Bay offshore test area across the sandy seabed then to shore via a channel in the near shore rock seabed. Between MLWS and MHWS, the cable will be laid through a channel created through the rock boulder surface to meet a semi vertical rock face where the cable will be fixed with the use of rock bolts above the ground surface rock level.

Onshore Cabling

Above MHWS, various route options associated with cabling to four location options for the temporary control station, are under consideration.

Temporary control station Options 1 - 3

In general routes will be trenched to around 1m depth. Where routing through the dunes, where possible it will follow established pedestrian pathways of exposed sand. There are existing pathways with a width of 1 m or more, allowing a small digger to trench the cable within the confines of the exposed sand path. The depth of the trench will be no more than 1 m. Up to two cable pits of approx. 1 m by 0.5 m with a 0.5 m width may be required in the area between MHWS and the temporary onshore control station, between which cable ducts would be installed through the dunes to facilitate removal/ replacement without additional disruption. Where possible a sufficient area of existing exposed sand along the cable route will be used for the location of these cable pits. Alternative options for cabling above MHWS as set out in Table 2-10, would require either trenching through the sand dunes or through the mobile beach sediment prior to trenching through either farm land or road side verge (temporary control station Options 2 and 3).

Temporary control station Option 4

The cable will be laid above ground to the control station location. At the point of crossing the Pembrokeshire Coast Walk the cable with either be buried or covered to enable continued use of

the path. Cable routing to area above East Pickard Bay would not be buried, except for where the cable crosses the Coastal Path.

Table 2-10: Offshore and Foreshore Cabling

Option	Temporary Control Station Option 1		Temporary Control Station Option 2		Temporary Control Station Option 3		Temporary Control Station Option 4
Option Description	Northern car park with cable route within footpath through dunes	Hollow near to northern car park with cable route within footpath through dunes	Land north of beach with cable route via road verge	Land north of beach with cross country cable route	Southern car park with cable route via road verge	Southern car park with cable route along beach	Land above East Pickard Bay. Cable routing along natural gully at East Pickard Bay
Below MLWS (Offshore)	1.0 km	1.0 km	1.0 km	1.0 km	1.0 km	1.0 km	1.4
Foreshore	0.33 km	0.33 km	0.33 km	0.33 km	0.33 km	0.33 km	0.045
Above MHWS (Onshore)	0.27 km	0.28 km	0.80 km	0.41 km	1.38 km	1.0 km	0.35
Total	1.6 km	1.61 km	2.13 km	1.74 km	2.71 km	2.33 km	1.8

It is currently proposed that cable installation will occur only during the over-wintering period September to February, if necessary, to minimise disturbance on important natural heritage interests, in particular, breeding chough (*Pyrrhocorax pyrrhocorax*).

The route for cable laying through the intertidal area (MLWS to MHWS) and sand dune area (above MHWS) is subject to discussion with stakeholders, including PNCPA and NRW, and landowners, however for the purpose of consultation (Scoping), an indicative 'Cable Route Corridor Search Area' has been identified (Figure 2-4). Within this search area, the maximum trench width for cable laying will be 1 m within the European sites. It is also proposed that a duct be installed through the dune areas between the two cable pits to minimise potential disruption from removal and also to facilitate repeated use of the infrastructure should it be required. Table 2-11 provides the PDE for the cable.

Table 2-11: East Pickard Bay Cabling PDE

Project Detail	Temporary control station Options 1-3 (cable route via beach)	Temporary control station Option 4 (cable route via East Pickard Bay)
Marine Cabling (below MLWS)		
Installation methodology	Laid on seabed with clamshell weights to maintain in position to an anchor point 50 m from the point of MLWS, then trenched	Laid on seabed in areas of sandy seabed with clamshell weights to maintain in position. Laid in natural rock channel with clam shell weights in areas of rocky seabed
Cable specification	150 mm diameter reinforced cable	150 mm diameter reinforced cable
Length of cabling	See Table 2-10	See Table 2-10
Duration of installation	Up to 3 days, subject to sea conditions	Up to 3 days, subject to sea conditions. The cable will be floated ashore and then using divers the floats will be cut so that the cable rests on seabed.
Vessels	Maximum length of 50 m, and a maximum draught of 3 m. Likely to include installation barge, multicat and small work boats	Maximum length of 50 m, and a maximum draught of 3 m. Likely to include installation barge, multicat and small work boats
Number of vessels	Up to 4 vessels – including guard boat	Up to 4 vessels – including guard boat
Cabling between MLWS and MHWS		
Installation methodology	Cable trenched through intertidal area. Should beach material be removed in clear sediment layers, these will be stored separately during excavation works and replaced in the correct order following laying of the cable	The cable will be laid through a natural gully. It will be fixed to a semi vertical rock face with rock bolts above the ground surface rock level.
Cable specification	150 mm diameter reinforced cable	150 mm diameter reinforced cable
Length of cabling	0.33 km	See Table 2-10
Cable trench width	1 m	N/A
Cable trench depth	1 m	N/A
Duration of installation works	1 day	3 days

Project Detail	Temporary control station Options 1-3 (cable route via beach)	Temporary control station Option 4 (cable route via East Pickard Bay)
Plant requirements	Approx. 10 tonnes	None. Hand tools only
Number of plant	One JCB digger	None
Cabling above MHWS		
Installation methodology	Trenched through sand dunes along existing footpaths where possible and buried in a duct with excavated beach material. Should dune material be removed in clear sediment layers, these will be stored separately during excavation works and replaced in correct order following laying of the cable. Up to 2 cable pits of approx. 1 m by 0.5 m with a 0.5 m width may be required at each end of the duct in the area between MHWS and the temporary onshore control station. This is important because it is the point at which the permanent cable permission becomes temporary	The cable will be laid above ground via a gully. In the lower rocky section, the cable will be secured with rollers bolted to the rock face for a section of approx. 50m vertical height. The cable will be pulled from a location approximately 180m above low tide. Above the rock section the cable will be laid above ground following the grassed gully. At the point of crossing the Pembrokeshire Coast Walk, the cable will either be buried or covered to enable continued use of the path.
Cable specification	150 mm diameter reinforced cable	150 mm diameter reinforced cable
Length of cabling	This is dependent on final location of temporary control station. Up to 1.38 km	See Table 2-10
Cable trench width	1 m	Trench only across Coastal path. 2m
Cable trench depth	1 m	Trench only across Coastal path. 1m
Duration of installation works	Up to 5 days	Up to 5 days
Plant requirements	Approx. 10 tonnes	One JCB with back hoe.
Number of plant	Two JCB diggers	JCB digger for cable pulling and trenching across Coastal path.

Temporary Control Station

The temporary control station will be chosen to minimise visual impact from agreed key vantage points (VPs), which are likely to include the coastal path, Freshwater West beach, and associated beach carparks. The most likely design of the temporary control station will constitute two 20 ft (i.e. 6 m) shipping containers which will be designed to minimise visual impact, for example use of recessive paint colour. Cladding applied at the temporary control station will be determined through further consultation with NRW and PCNPA. A Wi-Fi antenna will be located on the roof of the temporary control station. A typical antenna that could be used, is approx. 15 cm x 15 cm at the top of a 1 m high mast. The temporary control station will house power and electrical facilities to support power and communications equipment for monitoring of marine device testing. The temporary control station may use a small wind turbine for power if placed at Option 4. Details of the proposed PDE for the temporary onshore control station at East Pickard Bay is provided in Table 2-12.

Access for installation machinery to the intertidal and the dune system cable trenching locations for Option 1 – 3 will be via the northern car park or the Royal National Lifeboat Institution (RNLI) access to the beach at the southern end. Access to Option 4 will be via farm track on private land. All access will be via this pre-defined and agreed route and access route width will be no more than 1 m within the sand dune area and along footpaths where possible to ensure any disturbance to the sand dune habitats is minimised.

For Options 1-3, the consent for the cable offshore and up to the onshore cable pit will be for a period of 25 years. The consent for the cable from the cable pit to the temporary onshore control station will be temporary with a duration of 1.5 years for options 1-3 (the additional 6 months to reflect the potential requirement for the cable to be installed 6 months ahead of the cabin due to the seasonal restriction on installation). For Option 4, the consent for the cable offshore and onshore will be limited to 1.5 years to reflect the difficulty of installation through the foreshore and sensitivities of the designated site. In the event that a cable becomes exposed, or if a cable is disused for a period of time, a suitable course of action will be managed by the Environmental Monitoring and Mitigation Plan (EMMP).

Table 2-12: East Pickard Bay onshore control station infrastructure PDE

Project Detail	PDE
Structure	2 x 20 ft (6 m) shipping containers
Dimensions	2 containers of 20 ft (12.1 m) x 8 ft 6 (2.6 m) x 8 ft (2.4 m)
Aesthetic	The cabin will be a recessive colour. Cladding applied will be determined through further consultation with NRW and PCNPA
Power Requirements	A small diesel generator will be used. This will be operated continuously during the operation of the mWave device A compressor will also be contained in the cabin which will be operated for 2 hours every 6 hours
Installation methodology	Cabins transported to site via existing road network on a vehicle with a crane lift. Should the cabin be placed on farmland away from the existing road network, temporary trackway will be laid for access and removed after delivery

Project Detail	PDE
Duration of installation	1 day
Plant requirements for installation	Truck with high mounted crane
Number of plant required for installation	1
Duration of infrastructure on site	Temporary control station – 1 year Cabling from temporary control station to junction pit – 1.5 years Cabling from offshore test site to junction pit 25 years

3 Consenting

3.1 Consultation

Statutory and non-statutory stakeholders have been identified for consultation throughout the META Project consenting process. Table 3-1 provides a summary of consultation undertaken to date (end of October 2018).

Table 3-1: Consultation to inform the META Project Consenting Strategy

Consent Requirement	Stakeholders	Area of discussion	Key agreement between parties
Marine Licence	NRW-MLT	Suitability of a single Marine Licence to cover all sub-areas that require a Marine Licence. Potential requirement for EIA	MEW agreed to submit a Phase 1 Technical Note to allow NRW-MLT to confirm consenting requirements for Phase 1. NRW-MLT have confirmed Phase 1 sites require a Band 2 Marine Licence. It is proposed to submit separate offshore and onshore sHRA's in support of the ME application to reflect shorter timescale for issuing consent for onshore works.
Marine Works Licence	MHPA	Potential need for a Marine Works Licence for some META activities and/or sites	MHPA would look to issue a single Marine Works Licence for META activities requiring a Marine Works Licence An EIA and an offshore sHRA will also be required Both to be submitted in parallel with the Marine Licence application to NRW-MLT
Decommissioning Plan	BEIS	Potential need for a decommissioning plan for the META Project	Discussions are ongoing, however at this stage it is assumed that a decommissioning

Consent Requirement	Stakeholders	Area of discussion	Key agreement between parties
			plan will be required, and this will be submitted at the same time as the Marine Licence application
Seabed Lease	TCE	Potential need for a bespoke approach to agreeing seabed leases for the META sites	META Phase 1 sites will be licensed from TCE under a Crown Estate Small Works License. META Phase 2 sites (Warrior Way, Dale Road and East Pickard) will require a Crown Estate Lease. META are currently in discussion with TCE to agree lease arrangements. Device developers will not be required to obtain a separate TCE Lease/Agreement
Planning Permission	PCC	Planning Permission requirements	Early discussions with PCC Development Manager (Major Developments and Planning Obligations) Mike Simmons indicate that planning permission may be required for META Phase 1 sites. This is to be confirmed. Planning permission will be required for Phase 2 site Warrior Way.
	PCNPA	Planning Permission requirements for onshore infrastructure and marine cabling above MLWS	An initial meeting with Head of Development Management at PCNPA (Nicola Gandy) held on 30th July 2018 confirmed that

Consent Requirement	Stakeholders	Area of discussion	Key agreement between parties
			planning permission will be required for onshore infrastructure and marine cabling works above MLWS associated with the East Pickard Bay site. Subsequent site walkover 10th Sept to review. It is proposed to submit separate offshore and onshore sHRA's in support of the ME application to reflect shorter timescale for issuing consent for onshore works.
S.36	MMO	Potential requirement for S.36 for Phase 2 META activities/sites	The MMO (Joseph Wilson) confirmed *"that Section 36 applies to the generation rather than the transmission therefore the fact that the devices would not be connected to the grid would not alter the requirement for Section 36. In addition, the 1MW threshold applies to the capacity of the site rather than each generating device."*

3.2 Planning and Consenting Context

3.2.1 Policy Context

A summary of national legislation and consenting policy context in Wales relevant to the consenting of the META Project (META Phase 2 test areas), is provided within the detailed of each policy or plan provided in Appendix 1 (9.1.2).

- UK Marine Policy Statement;

- Well Being and Future Generations Act 2015;
- Wales Spatial Plan Update 2008;
- Draft Welsh National Marine Plan;
- Planning Policy Wales Edition 9 (November 2016);
- Technical Advice Note 5: Nature Conservation and Planning (2009);
- Technical Advice Note 14: Coastal Planning (1998);
- Technical Advice Note 18: Renewable Energy (2005);
- Technical Advice Note 23: Economic Development (October 2014);
- Pembrokeshire Local Development Plan (February 2013);
- Pembrokeshire Coast National Park Local Development Plan (September 2010); and
- Registered Historic Landscapes.

3.2.2 Consenting Context

Marine Works Licence - Milford Haven Port Authority

MHPA administer Marine Works Licences under the Milford Haven Conservancy Act 1983 in pursuance of Section 18 - Licence of Works, or Section 19 - Licence to Dredge. Permission is required from the MHPA to construct, alter, renew or extend any works in the harbour on, under or over tidal waters, or land below the level of high water. This requires a Marine Works Licence application to be submitted to the Harbour Authority. All Phase 2 sites will require a Marine Works Licence (Table 3-2). A single Marine Works Licence will be applied for, for all three Phase 2 sites.

Marine and Coastal Access Act: Marine Licence – Natural Resources Wales Marine Licensing Team

Proposed META Project activities include the potential to deposit infrastructure on the seabed, a licensable activity under the Marine and Coastal Access Act (MCAA) 2009 (administered by NRW-MLT).

It is proposed that a separate Marine Licence application will be submitted for each META Phase 2 site i.e. separate applications for Warrior Way, Dale Road and East Pickard Bay (Table 3-2).

Planning Permission – Pembrokeshire County Council

Under the Town and Country Planning Act (1990) and the Planning (Wales) Act 2015, PCC's jurisdiction extends down to the middle of the Haven (Figure 1-1). The proposed sites which will require Planning Permission from PCC are shown in Table 3-2.

Planning Permission – Pembrokeshire Coast National Park Authority

Planning Permission is required from PCNPA for ancillary onshore facilities associated with some device deployments, where these lie within the Pembrokeshire Coast National Park area (see onshore ecology map Both East Pickard Bay and Dale Roads fall within the PCNPA jurisdiction, however there are no proposed ancillary onshore facilities associated with Dale Roads. Onshore infrastructure is proposed at East Pickard Bay; therefore, a T&CP application will be made to PCNPA for onshore infrastructure associated with offshore testing at East Pickard Bay (Table 3-2).

Crown Estate Lease – The Crown Estate

Under TCE Act (1961), TCE own the foreshore and seabed out to a distance of 12 nm, and manages the right to generate electricity from wind, wave and tides on the continental shelf, under the Energy Act 2004 (TCE, 2016). Rights for renewable energy developments are generally granted under an "Agreement for Lease" (TCE, 2016).

As META Phase 2 activities may include placing of infrastructure on the seabed or foreshore, an Agreement for Lease is likely to be required from TCE (Table 3-2).

Discussions with TCE have highlighted a secondary route for agreements for activities within the Waterway; TCE Small Works Licences (SWL). SWL are administered by TCEs local agent and are granted for activities not requiring statutory consents. This alternative route will be used for Phase 1 activities and sites as appropriate.

Section 36 Electricity Act – Marine Management Organisation

The MMO is currently responsible for considering and determining applications for consent under S.36 of the Electricity Act for offshore generating stations with a generating capacity of more than 1 MW but less than or equal to 100 MW.

From April 2019 applications for projects between 1 MW and 100 MW in Welsh waters will be devolved to the Welsh Ministers (Wales Act, 2017). The META Project Marine Licence applications and S.36 consent application is planned for submission in March 2019, and it has been confirmed by the MMO that they would be responsible for submission of S. 36 applications up to transfer of all powers to the Welsh Government in April 2019. It is understood therefore that the MMO would be the consenting authority for the META S. 36 application. A single S.36 consent will be applied for, for all three Phase 2 META sites (Table 3-2).

3.2.3 META Consenting Strategy

A consenting strategy has been drafted for the META Project, to ensure that all relevant consenting requirements are identified and discussed with the appropriate planning/consenting authorities and their statutory advisors, at an early stage (MEW, 2018). This may be viewed in its entirety in the *META Consenting Strategy Report (report 180806)*.

MEW's aim is to follow a phased approach to licensing the suite of test sites that comprise the META Project.

Phase 1 will support activities that are deemed likely to have a low or negligible impact (due to the nature, number, scale and size of the activities and/or the duration of deployment) on the receiving environment and sites supporting these activities are therefore not deemed to require an EIA.

Phase 2 will support activities that are likely to have significant effects on the environment due to factors such as its size, nature or location, with consent applications supported by an EIA. A single EIA process and ES will be prepared to cover consideration of all onshore and offshore environmental impacts and will support both marine and terrestrial licence/consent applications for all Phase 2 sites.

These sites are:

- Warrior Way (Site 6);
- Dale Roads (Site 7); and
- East Pickard Bay (Site 8).

These sites are the focus of this EIA Scoping Report.

Based on the activities that are proposed to be enabled at Warrior Way, Dale Roads and East Pickard Bay (see Section 2.4), Table 3-2 below summarises the consenting requirements for these sites, along with consenting requirements for sites 1 – 5.

Table 3-2: META Phase 1 and 2 Sites Consenting (and EIA/HRA) Requirements.

Site Number	META site	Consent (and EIA/HRA) Requirement						
		Marine Works Licence	Marine Licence	Crown Estate Lease	Town and Country Planning	Section 36	HRA	EIA
1	Carr Jetty	Y	Y (2)	SWL	TBC	N	Y	N
2	Mainstay Quay	Y	Y (2)	SWL	TBC	N	Y	N
3	Ferryside	Y	Y (2)	SWL	TBC	N	Y	N
4	Quay 1	Y	Y (2)	SWL	TBC	N	Y	N
5	Criterion Jetty	Y	Y (2)	SWL	TBC	N	Y	N
6	Warrior Way	Y	Y	Lease	Y (PCC)	Y	Y	Y
7	Dale Roads	Y	Y	Lease	N	Y	Y	Y
8	East Pickard Bay	Y	Y	Lease	Y (PCNPA)	Y	Y	Y

3.2.4 Other Consents/Licences and Legislative Requirements

A number of additional consents and licences may also be required for Dale Roads, Warrior Way and East Pickard Bay.

Work to Inform Habitats Regulation Assessment (HRA)

Competent Authorities have a duty under the Conservation of Habitats and Species Regulations 2017, to conduct a Screening to assess whether the plan or project alone, or in combination with other plans or projects is likely to have a significant effect on a European site. Plans or projects adjacent, but not within a European site boundary will also undergo such a screening. If a significant effect is likely or uncertain, the Competent Authority has a duty to conduct an Appropriate Assessment to determine whether the plan or project alone, or in combination with other plans or projects, will have an adverse effect on the integrity of the European site.

MEW will produce a shadow HRA/work to inform an HRA to accompany the consent/licence applications. MEW intend to submit separate sHRAs for the offshore (below MHWS) and onshore (above MHWS) aspects of the META Project. The format of these assessments will be discussed and agreed with the competent authorities (see 4.1.2 for further detail).

Water Framework Directive Compliance Assessment

The area of sea between Mean Low Water and up to one Nautical Mile (NM) offshore is protected under the Water Framework Directive (WFD). The WFD requires that any plan or project does not cause deterioration in the water body in which the plan or project takes place.

For detail on the relevant legislation see Section 4.1.3.
MEW will undertake a WFD Compliance Assessment to support consent/licence applications.

Decommissioning Plan Sign Off

Decommissioning of devices capable of generating power is governed by Sections 105 to 114 of the Energy Act 2004. Responsibility for the administration and management of decommissioning activities in Wales lies with the UK Department for BEIS.

When a renewable energy developer has been granted a Marine Licence, a Notice to Decommission (otherwise known as a Section 105 notice) is issued to the developer. This places a requirement on the developer to produce a Decommissioning Programme. Guidelines (DECC, 2011) are available regarding the production of this document.

META propose to include decommissioning along with installation and operation, in each of the Marine Licence applications to be made to NRW-MLT, to ensure efficient and thorough applications. Discussions on the scope and content of decommissioning with NRW-MLT are ongoing and will be finalised prior to decommissioning commencing.

Potentially Damaging Operations

The Wildlife and Countryside Act (WCA) 1981 consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention). Under Section 28H of the WCA 1981 there is a requirement to give notice to the Competent Authority before carrying out operations likely to damage any of the flora, fauna or geological or physiological features by reason of which an SSSI is of special interest.

The EIA will have consideration of Potential Damaging Operations (PDOs) within the Milford Haven Waterway SSSI, Angle Peninsula Coast SSSI and Broomhill Burrows SSSI, and if required notification will be provided.

European Protected Species Licence

The Conservation of Habitats and Species Regulations 2017, known as the 'Habitats Regulations' transposes requirements of the European Habitats Directive (92/43/EEC) on the conservation of natural habitats and of wild flora and fauna in to UK law. This includes animals whose natural range includes any area of the UK, and animals which are included in Annex IV of the Directive and which are considered to be species of European Community interest and in need of strict protection (European Protected Species (EPS)). Within Wales the following EPS are known to occur:

- Cetaceans (whales, dolphins and porpoises);
- Marine turtles;
- Eurasian otter *Lutra lutra*;
- Common sturgeon *Acipenser sturio*;
- Bats;
- Hazel dormouse (*Muscardinus avellanarius*);
- Natterjack toad (*Epidalea calamita*); and
- Great crested newt (*Triturus cristatus*).

Of the cetacean species occurring within UK waters, the following species are known to occur in Welsh waters:

- Harbour porpoise;
- Bottlenose dolphin *Tursiops truncatus*;
- Short-beaked common dolphin *Delphinus delphis*;
- Risso's dolphin *Grampus griseus*; and
- Minke whale *Balaenoptera acutorostrata*.

Of the bat species occurring within the UK, the following species are known to occur in Wales:

- Barbastelle (*Barbastella barbastellus*);
- Bechstein's bat (*Myotis bechsteinii*);
- Brandt's bat (*Myotis brandtii*);
- Brown long-eared bat (*Plecotus auritus*);
- Common pipistrelle (*Pipistrellus pipistrellus*);
- Daubenton's bat (*Myotis daubentonii*);
- Greater horseshoe bat (*Rhinolophus ferrumequinum*);
- Leisler's bat (*Nyctalus leisleri*);
- Lesser horseshoe bat (*Rhinolophus hipposideros*);
- Nathusius' pipistrelle (*Pipistrellus nathusii;*
- Natterer's bat (*Myotis nattereri*);
- Noctule (*Nyctalus noctula*);
- Serotine (*Eptesicus serotinus*);
- Soprano pipistrelle (*Pipistrellus pygmaeus*); and
- Whiskered bat (*Myotis mystacinus*).

Under the Conservation of Habitats and Species Regulations 2017, it is an offence to deliberately or recklessly capture, injure or kill an EPS, or deliberately disturb wild animals of EPS.

As of 1st April 2018, the responsibility for the administration of EPS licence applications has transferred to NRW-MLT, who will be acting on behalf of the Welsh Ministers.

NRW-MLT issues licences under Regulation 55 of the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017, to allow activities that would otherwise constitute an offence under the Conservation of Habitats and Species Regulations 2017, to be carried out.

Some activities associated with META sites have the potential to cause an offence under the Regulations, therefore there may be a requirement to obtain a licence to disturb marine EPS from NRW-MLT. It is considered likely that some installation and operations/maintenance and decommissioning activities proposed at META will be of a nature and scale that an EPS licence will not be required in every case.

Basking Shark Licence

Basking shark *Cetorhinus maximus* are protected under Schedule 5 of the Wildlife and Countryside Act (WCA) 1981 (as amended). Under this Act it is an offence to intentionally kill, injure or take; damage or destroy a place of shelter or protection, or disturb them whilst occupying such a place; or obstruct access to such a place. In addition, it is an offence to intentionally or recklessly disturb a basking shark.

NRW can issue a licence under Section 16 (3) of the WCA to allow an activity to be carried out that would otherwise constitute an offence. NRW aim to process applications with 30 working days from receipt of a completed application, with all associated supporting information provided.

4 Approach to EIA

4.1 Legislative Framework

As outlined in Section 3.2.2 above and summarised in Table 3-2 above, consents and/or licences are required for testing activities supported at Warrior Way, Dale Roads and East Pickard Bay. Installation, Operation and Maintenance, and decommissioning activities at these Phase 2 sites described in this PDE, will be referred to as "the META Project" for the purposes of this EIA Scoping Report. As outlined in Section 3.3.1 above, an EIA, sHRA and WFD Assessment will be undertaken to support these consent and/or licence applications and will accompany these consent and/or licence applications. Both the HRA and EIA will distinguish between the Likely Significant Effects (LSE) in the context of their overarching legislation. Within each document a definition of what is meant by LSE will be provided. The legislative framework that underpins these assessments are described below.

4.1.1 EIA Directive

The legislative framework for EIA is set by European Directive 2011/92/EU, as amended by Directive 2014/52/EU (collectively referred to as the EIA Directive).

Member states transposed Directive 2014/52/EU requirements into national law prior to 16 May 2017, setting out arrangements for a transitional period from the regime laid down by Directive 2011/92/EU.

The EIA Directive requires an EIA to be completed '*in support of an application for marine consent for certain types of project*'. These are listed in Schedule 1 and Schedule 2 of the Directive. For projects of these types in Wales, the European legislative requirements are transposed into law by The Marine Works (EIA) Regulations 2007 (as amended) and the Marine Works (EIA) (Amendment) Regulations. These require the consenting authority to provide an assessment of likely significant effects of the proposed regulated activity or project on the environment. It should be noted that "Likely Significant Effect" is terminology used by both EIA Regulations and The Conservation of Habitats and Species Regulations 2017 (Habitats Regulations). As such, in the context of this Scoping Report, the use of "Likely Significant Effect" is understood to mean the potential impact of an activity or project on the environment resulting from the nature of the activity proposed, as used by The Marine Works (EIA) Regulations 2007. Where "Likely Significant Effect" is used as defined by the Habitats Regulations, this will be highlighted and clarified.

The EIA Directive requires an EIA to be completed in support of an application for Section 36 consent, for which the European legislative requirements are transposed into law by The Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2017.

The process of identifying whether or not EIA is required for a development is known as screening. Projects of the type listed in Schedule A1 of the Regulations require EIA in all cases. Projects of the type listed in Schedule A2 may require EIA in certain circumstances.

Projects listed in Schedule A1 are considered to have the potential to have significant effects on the environment and will require EIA in all cases. Schedule A2 projects will only require EIA if NRW-MLT "*concludes that the project in question is likely to have significant effects on the environment due to facts such as its size, nature and location*" (naturalresourceswales.gov.uk). The proposed activities supported at the META Project would fall within the Schedule A2 category 13 "*Energy – Industrial installations for the production of electricity, steam or hot water*"; and category 20 "*Installations for hydroelectric energy production*".

Schedule 2 outlines the matters relevant to consideration of whether or not a schedule A2 project is likely to have significant effects on the environment. The criteria include the characteristics of the development, location of development and characteristics of the potential impact. It is considered that EIA is required for the proposed META Project. The EIA will take into account the requirements outlined in Schedule 3 of the Regulations, for information to be included in an ES.

4.1.2 Habitats Regulation Assessment (HRA)

The Conservation of Habitats and Species Regulations 2017 and the 'Habitat Regulations' require the assessment of any significant effects on qualifying features of internationally important nature conservation sites that are likely to arise because of a proposed project. Internationally important sites include SACs, or cSACs, SPAs or potential SPAs (pSPAs), Sites of Community Importance (SCI) and Ramsar sites. These are often referred to as European sites. This assessment is to be undertaken by the 'competent authority' as defined by the Habitat Regulations. There are several regulatory authorities involved in the consenting of the META Project, therefore there is potentially more than one Competent Authority under these Regulations. Competent Authority may be:

- NRW-MLT (Marine Licence);
- MMO (S. 36);
- MHPA (Marine Works Licence);
- PCC (Planning Permission within the Waterway); and
- PCNPA (Planning Permission for East Pickard Bay).

Discussion with all parties will take place to agree roles and responsibilities, including, if/as appropriate, lead Competent Authority role(s) for the META Project. The processes for coordination and ensuring appropriate input from all parties during development of the sHRA will also be agreed.

To carry out the sHRA, the Competent Authority(ies) requires that a report is submitted alongside any consent or licence applications under Section 63(1-2) of the Conservation of Habitats and Species Regulations 2017. While the report to inform sHRA does not form part of the ES, the baseline information presented within the ES will contain some of the same information.

The report to inform the onshore and offshore sHRAs (proposed to be assessed separately) will be complied using The Planning Inspectorate guidelines on HRA (Advice Note 10: Habitats Regulations Assessment relevant to nationally significant infrastructure projects) and The David Tyldesley and Associates (DTA) Publications Habitats Regulations Assessments Handbook, in consultation with the Competent Authority and nature conservation authorities.

4.1.3 Water Framework Directive

Consideration of the Water Framework Directive (WFD) (Council Directive 2000/60/EC) is required to support marine licence applications to NRW-MLT.

The WFD aims to protect and enhance water bodies within Europe and covers all estuarine and coastal waters out to 1 NM. Under the WFD, coastal waters, estuaries, rivers, man-made docks and canals are divided into a series of water bodies. Within each water body, the WFD sets ecological and chemical status objectives. The aim of the WFD was for all water bodies to achieve "good status" by 2015, although since this was not achieved in the UK, these targets have since been revised by the relevant UK bodies, including NRW. Under all conditions, it requires that there should be no deterioration in status.

A WFD assessment is required where a project has the potential to impact on water bodies or protected areas under the WFD and has the potential to cause deterioration in the ecological and chemical status of a water body, or to compromise improvements which might otherwise lead to a water body meeting its WFD objectives. The META Project sites are located within the boundaries of the Milford Haven Inner Transitional Waterbody (Warrior Way); Milford Haven Outer Transitional Waterbody (Dale Roads); and Pembrokeshire South Coastal Waterbody (East Pickard Bay). A WFD assessment is therefore required. See Figure 4-1 for the META site locations in relation to NRW WFD Boundaries.

Currently, the most appropriate guidelines for undertaking WFD assessments in Welsh waters are the NRW '*Guidance for assessing activities and projects for compliance with the Water Framework Directive*' (NRW, 2018). The WFD assessment will draw on the information presented within the ES, considering the effects of the marine elements of the project on receptors, including

hydromorphology, biology (habitats and fish), water quality, protected areas and invasive and non-native species (INNS) (NRW, 2018).

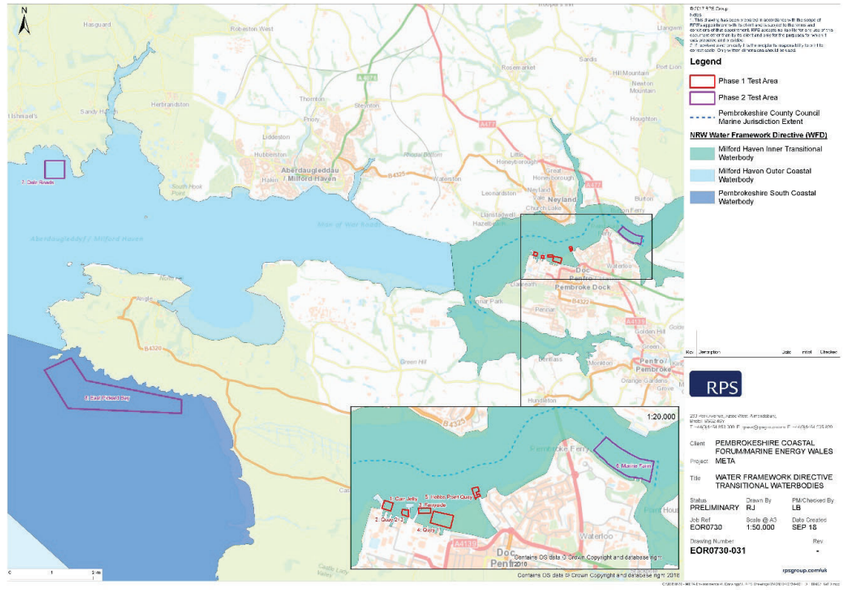

Figure 4-1: The META Sites (Phase 1 and 2) and NRW Water Framework Directive Boundaries

4.2 Information Requirements

Although there is no statutory provision as to the form of an ES, it must contain the information specified in Regulation 12 and Schedule 3 of The Marine Works (EIA) Regulations 2007 (as amended), see Appendix 1 – Regulations.

4.2.1 Relevant EIA Guidance

The impact assessment methodology draws upon a number of EIA principles, regulations and guidance documents, including:

- Welsh Office Circular 11/99: EIA;
- Department for Communities and Local Government (2014) Planning Practice Guidance at http://planningguidance.planningportal.gov.uk;
- Department of the Environment, Transport and the Regions (DETR) (1997) Mitigation Measures in Environmental Statements;
- Chartered Institute of Ecology and Environmental Management (CIEEM) (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (2nd Ed.)
- Institute of Environmental Management and Assessment (IEMA) (2004) Guidelines for EIA;
- IEMA (2011) The State of EIA Practice in the UK. Special Report;
- IEMA (2015a) EIA: Guide to Shaping Quality Development;
- IEMA (2015b) Climate Change Resilience and Adaptation;
- IEMA (2016) EIA: Guide to Delivering Quality Development;
- IEMA (2017) EIA: Assessing Greenhouse Gas Emissions (GHG) and Evaluating their Significance;
- A Review of Assessment Methodologies for Offshore Wind Farms (COWRIE METH-08-08) (Maclean *et al.*, 2009);
- Offshore Wind Farms: Guidance Note for EIA in Respect of Food and Environment Protection Act 1985 and Coastal Protection Act 1949 requirements (Cefas, 2004);
- Cumulative Impact Assessment (CIA) Guidelines - Guiding Principles for CIA in Offshore Wind Farms (RenewableUK, 2013);
- Guidelines for data acquisition to support marine environmental assessments of offshore renewable energy projects (Cefas, 2012); and
- Other topic-specific specialist methodologies and good practice guidelines will be drawn on as necessary.

A full account of the relevant legislation and guidance will be documented within the ES.

4.3 Key Elements of the Approach to EIA

The assessment of each environmental topic will form a separate Chapter of the ES. For each topic the following information will be provided:

- Methodology and assessment criteria;
- Description of the environmental baseline (existing conditions);
- Identification of likely effects of the META Project, based on the PDE;
- Evaluation and assessment of the significance of identified effects, taking into account any measures designed to reduce or avoid environmental effects which form part of the project and to which the developer is committed;
- Identification of any further mitigation measures envisaged to avoid, reduce and, if possible, remedy adverse effects (in addition to those measures that form part of the project); and
- Cumulative effects of the Phase 2 sites together, and of the META Project with other plans or projects within a defined Study Area; 'the cumulative Study Area'.

4.3.1 Approach to Assessment

Each identified topic Chapter will follow the assessment layout detailed below:

- Topic Heading;
- Assessment Methodology;
- Summary of Baseline (across all Phase 2 sites). If there are key differences between Phase 2 sites further details will be provided for each site;
- Assessment of Effects; and
  - Route to Impact (e.g. increased vessel traffic):
    - Sensitivity of Receptor (if there are key differences between each Phase 2 site, further details will be provided for each site); and
    - Magnitude of Impact:
      - Warrior Way (Site 6);
      - Dale Roads (Site 7); and
      - East Pickard Bay (Site 8).
    - Significance of Effect:
      - Warrior Way;
      - Dale Roads;
      - East Pickard Bay; and
      - Summary.
- CIA:
  - Tier 1: META Project – all Phase 2 sites considered together; and
  - Tier 2: META Project with other plans or projects within the CIA Study Area.

4.3.2 Impact Assessment Methodology

Each topic Chapter will provide details of the methodology for baseline data collection and the approach to the assessment of effects. Details of the proposed approach for each topic are provided in Section 6 of this Scoping Report. Each identified environmental topic will be considered by a specialist in that area. The identification and evaluation of effects will consider relevant topic-specific guidance where available.

4.3.3 Environmental Baseline

The existing and likely future environmental conditions in the absence of the META Project are known as 'baseline conditions'. Each topic-based Chapter will include a description of the current (baseline) environmental conditions. The baseline conditions at the site and within the Study Area form the basis of the assessment, enabling the likely environmental effects of the proposed works to be identified through a comparison with the baseline conditions.

The baseline for the assessment of environmental effects will characterise existing conditions at the proposed META Project Study Areas. Consideration will also be given to the likely future baseline during the installation and operation of the META project infrastructure, and installation and operation of device deployments encompassed within the META Project PDE. In some cases, these changes may include the construction or operation of other planned developments in the area. Where such developments are built and operational at the time of writing, these will be considered to form part of the baseline environment. Where sufficient and robust information is available, other future developments will be considered as part of the future baseline conditions. In all other cases, planned future developments will be considered within the assessment of cumulative effects.

The consideration of future baseline conditions will also consider the likely effects of climate change, as far as these are known at the time of writing. This will be based on information available from the United Kingdom (UK) Climate Projections project, which provides information on plausible

changes in climate for the UK and on published documents such as the UK Climate Change Risk Assessment 2017 (Government, H.M., 2017).

Assessment of species or habitats receptors as Valued Ecological Receptors (VERs) will be presented for each receptor group in the baseline characterisation of each technical Chapter (where relevant), following the criteria set out in Table 4-1.

Table 4-1: Valued Ecological Receptors (VERs) criteria

Value of VER	Criteria to Define Value
International	• Internationally protected species and habitats that are the primary reason for site selection of internationally protected sites (e.g. Annex II protected species designated as features of an SPA); • Internationally protected species or habitat, which are not the primary reason for site selection, but are a qualifying interest features of the site; • Internationally protected species with known breeding or nursery areas within the Study Area that are considered to be important either nationally or internationally for that species, even where this has not been recognised through designation; or • Internationally protected habitats with overlap within the Study Area that are considered to be important either nationally or internationally for that habitat, even where this has not been recognised through designation.
National	• Internationally protected species or habitat that are not a qualifying interest features of a SPA or SAC but are regularly recorded within the Study Area. This might be in relatively low densities and therefore the area is not considered to be important for the species or habitat in an international context; and • Internationally protected species or habitats that are not qualifying interest features of an SPA or SAC but are recognised as a Biodiversity Action Plan (BAP) or Section 7 priority species or habitat either alone or under a grouped action plan and are listed on the local action plan relating to the Study Area.
Regional	• Internationally protected species or habitat that are not qualifying interest features of an SPA or SAC and are infrequently recorded within the Study Area.
Local	• Habitats or species that are considered of importance in a local context.

4.3.4 Identification of Likely Effects

The EIA Regulations require the identification of the likely significant environmental effects throughout the scoping and EIA of the META Project. Each topic Chapter will take into account both the sensitivity of receptors affected and the magnitude of the likely impact in determining the significance of the effect.

4.3.5 Sensitivity or Importance of Receptors

Receptors are defined as the physical resource or user group that would be affected by a proposed development. The baseline studies will identify potential environmental receptors for each topic and will evaluate their sensitivity to the proposed MEA Project. The sensitivity or importance of a receptor may depend, for example, on its frequency or extent of occurrence at an international, national, regional or local level.

4.3.6 Magnitude of Impact

Impacts are defined as the physical changes to the environment attributable to the META Project. For each topic, the likely routes to sensitive receptors will be identified. The magnitude of the impact will be described using defined criteria within each topic Chapter.

The categorisation of the impact may take into account the following factors:

- Extent;
- Duration;
- Timing and frequency; and
- Reversibility.

Impacts will be defined as either **adverse** or **beneficial**. Depending on discipline, they may also be described as:

- **Direct**: Arise from activities associated with the META Project. These tend to be either spatially or temporally concurrent; or
- **Indirect**: Impacts on the environment which are not a direct result of the META Project, often produced away from the project site or as a result of a complex pathway.

Impacts will be divided into those occurring during the installation and decommissioning of the META Project infrastructure or device testing, and those occurring during Operation and Maintenance of device testing.

4.3.7 Significance of Effects

Effect is the term used to express the consequence of an impact (expressed as the 'significance of effect'), which is determined by correlating the magnitude of the impact with the sensitivity of the receptor or resource.

The magnitude of an impact alone does not directly translate into significance of effect. For example, a significant effect may arise as a result of a relatively modest impact on a resource of national value, or a large impact on a resource of local value. In broad terms, therefore, the significance of the effect can depend on both the impact magnitude and the sensitivity or importance of the receptor.

Levels of significance that will be used in the assessment include (for both positive and negative effects, in descending order:

- Major;
- Moderate;
- Minor; or
- Negligible.

4.3.8 Cumulative Effects

The cumulative effects of the proposed development in conjunction with other proposed schemes will be considered. Each META Project Phase 2 site will be assessed for impacts on its own, cumulatively with other META Project Phase 2 sites, and cumulatively with other plans or projects within a pre-defined geographical area. The geographical area may be different for different receptors. The CIA will consider any developments that are at the scoping stage or later in the consenting process. Developments that are built and operational at the time of assessment will be considered as part of the baseline.

4.3.9 Measures Adopted as part of the Project

The EIA Regulations require that, where significant environmental effects are identified '*A description of the measures envisaged to prevent, reduce and offset any significant adverse effects of the project and the regulated activity on the environment.*' should be included in the ES.

The development of mitigation measures is part of an iterative EIA process. Therefore, measures will be developed throughout the EIA process in response to the findings of initial assessments. The META Project will include a range of measures designed to reduce or prevent significant adverse environmental effects arising, where practicable. In some cases, these measures may result in enhancement of environmental conditions.

The topic Chapters will therefore include consideration of mitigation measures that are:

- Measures included as part of project design;
- Measures to be included as part of installation or decommissioning techniques to reduce the potential impact on the receiving environment such as pollution control or reduction in noise emissions; and
- Measures required to comply with legislative requirements.

Measures adopted as part of the project will include the development of, and adherence to:

- An Ecological Management Plan (EMP);
- An Environmental Mitigation and Monitoring Plan (EMMP); and
- A Written Scheme of Investigation (WSI) for the Historic Environment.

Where required, additional measures will be set-out in each topic Chapter where a potential residual impact is identified despite the above mitigation measures.

5 Scope of the Assessment

5.1 Work to Inform EIA

The following data and site-specific surveys have been undertaken or are currently ongoing and will be used to inform the EIA:

Data:

- Shipping and Navigation (Anatec UK Ltd., 2010; and Seazone Solutions Ltd., 2010);
- Aviation and Radar (BWEA Aviation, 2010; RESTATS, 2010; and Civil Aviation Authority, 2007);
- Landscape and Social Designations (Cadw, 2010; NRW, 2010; and National Parks Authorities, 2010);
- Landscape and Seascape (NRW, 2010);
- Archaeology (Seazone, 2010; and Cadw, 2010);
- Oil and Gas (Department of Energy and Climate Change (DECC), 2010; UK Deal, 2010; and Seazone Solutions Ltd., 2010);
- Cable and Pipelines (Seazone/ DECC, 2010; and Sea Fish Industry Authority, 2010);
- Renewable Energy (National Grid, 2010; Western Power Distribution, 2018; and Project Specific Sources, 2010);
- Recreation (NRW, 2010; Seazone Solutions Ltd., 2008; Royal Yachting Association (RYA), 2010; Sustrans, 2010; National Trust, 2010; and Visit Wales, 2010);
- Fisheries and Shellfisheries (NRW, 2010; Maritime Data, 2010; COWRIE, 2010; MAGIC, 2010; and Seazone Solutions Ltd., 2010);
- MOD Interests (MOD, 2008; RPS Planning and Development, 2007; and Seazone Solutions Ltd., 2010);
- Disposal at Sea (Seazone Solution Ltd., 2010);
- Fish Ecology (CEFAS, 2007 and 2011);

- Bird Ecology (NRW / Coastal Assessment, Liaison and Monitoring (CALM), 2010; and NRW, 2018);
- Marine Mammals (NRW/ CALM, 2010; and NRW, 2010);
- Intertidal Ecology (NRW/ CALM, 2010);
- Conservation Designations (NRW, 2010 and 2018);
- Subtidal Ecology (JNCC, 2007; Seazone Solutions Ltd., 2010; OSPAR, 2018; and NRW, 2018);
- Physical Processes and Geology (Seazone Solutions Ltd., 2010; and NRW/ CALM, 2010);
- Marine Renewable Energy Resource (Department of Trade and Industry, 2010; Proudman Oceanographic Laboratory (POL), 2010; and RPS Planning and Development, 2011);
- Aggregate dredging (TCE, 2010; British Marine Aggregate Producers Association, 2010; and Milford Haven Facilities, 2018);
- Elevation (Seazone Solutions Ltd., 2010); and

Site-specific surveys:

- Intertidal survey of the beach at Freshwater West (October 2018);
- Further surveys for cable route Option 4 (to be determined);
- Extended Phase 1 Habitat Survey (October 2018);
- National Vegetation Survey (NVC) (to be undertaken Spring 2019); and
- Ornithology surveys, including over-wintering red-billed chough survey (to be undertaken Winter 2018/19).

Specific reports used to inform the Technical Chapters can be found under the baseline studies heading. Any reports for the EIA will use the most up-to-date contemporary evidence (i.e. within the last 5 years); reports and data will be sought from Offshore Renewables Joint Industry Programme, Tethys, State of the Science, relevant grey literature and other offshore renewable energy consents projects. In addition, any relevant data and advice notes (i.e. information on SACs – including Regulation 37 package for relevant SACs, SSSI etc.) held by the NRW will also be used to inform the EIA.

Though not part of the EIA process, the above data, reports and surveys will also inform the sHRA and WFD Compliance Assessment (See Section 3.3.1 above).

5.2 Topics Scoped out of the Assessment

Considering the findings of the above studies, together with knowledge of the site and surrounding area, it is proposed that the following topics are not included in the scope of the ES. Specific impact pathways that have been scoped out are detailed in the relevant chapters (Section 6 *et Seq.*). Justification for each topic scoped out of further assessment is provided in Sections 5.2.1 to 5.2.7 below:

- Climate change;
- Population and human health;
- Material assets;
- Radiation and Heat;
- Air Quality;
- Hydrology and Flood Risk; and
- Geology/Ground Conditions;

5.2.1 Climate Change

An assessment of climate change and GHG is required under the EIA Regulations where there is potential for likely significant environmental effects. At present there is no single piece of methodological guidance accepted as standard, although IEMA's guidance on GHG emissions states that, '*in principle, any GHG emissions may be considered to be significant, and advocates as good*

practice that GHG emissions should always be reported at an appropriate, proportionate level of detail in an ES' (IEMA, 2017).

The META Project will facilitate the development and advancement of marine renewable energy technologies and devices that would reduce reliance on fossil fuels, in turn reducing the emission of GHGs in response to the threat of climate change. The prototypes intended for testing are expected to have a negligible impact on local receptors therefore this topic has not been given its own Chapter within ES. However, climate change will be considered within topic ES Chapters as appropriate, and consideration in these assessments will be relevant and proportionate to the development proposed. Where possible the onshore control station will run on renewable sources of energy to offset any use of non-renewable fuel (i.e. diesel generator).

5.2.2 Population and Human Health

An assessment of population and human health is required by the 2017 EIA Regulations where there is potential for likely significant effects. No guidance for assessment of health in EIA is available currently (expected later in 2018).

Population and human health has a broad scope and is in practice considered across a range of other topic areas within the ES, in particular Socio-Economic and Tourism (Section 6.14), Noise and Vibration (Section 6.8), Landscape and Visual (Section 6.13), and Other Users (Section 6.15). These topics are proposed to be included within the ES. The META Project will also facilitate the advancement of a green energy resource, leading to less dependency on fossil fuels and thus less pollution adversely affecting the human population. No separate consideration of population and human health is therefore considered necessary and it has been scoped out of the ES.

5.2.3 Material Assets

The EIA Regulations refer to 'material assets', including architectural and archaeological heritage. The phrase 'material assets' has a broad scope, which may include assets of human or natural origin, valued for socio-economic or heritage reasons. Material assets are in practice considered across a range of topic areas within an ES, in particular the Other Users (Section 6.15), Socio-economic and Tourism (Section 6.14); Marine Archaeology (Section 6.12); and Historic Environment (Section 6.11) Chapters. These topics are proposed to be included within the ES and therefore no separate consideration of material assets is considered necessary and this topic has been scoped out of the ES.

5.2.4 Radiation and Heat

No significant radiation or heat effects are anticipated due to the nature and scale of activities being proposed. An assessment of these effects has therefore been scoped out of the ES.

5.2.5 Air Quality

Due to the location, duration, scale and nature of activities proposed at the META Project, there is a low risk of impact on air pollution. There will be additional traffic only for installation of the cable, and installation and operation of temporary control station at East Pickard Bay. Air quality will be considered within the Other Users (Section 6.15) Chapter of the ES. Further consideration of this potential impact has therefore been scoped out of the ES.

5.2.6 Hydrology and Flood Risk

Due to the nature and scale of activities proposed, there is a low potential risk of impact on hydrology and flood risk. The cable impacts at East Pickard Bay will be assessed within the Coastal Processes Chapter (Section 6.1) of the ES, and therefore further consideration of this potential impact has been scoped out of the ES.

5.2.7 Geology/ Ground Conditions

Low risk of impact from temporary control station only; cable route covered by Coastal Processes (Section 6.1) Chapter.

5.3 Content of the Environmental Statement

The proposed content of the Environment Statement is provided in Table 5-1, which lists the Sections and Chapter headings proposed for the ES.

Table 5-1: Content of the ES

Chapter number	Chapter Topic
Prologue	Non-Technical Summary (NTS)
	Abbreviations and Glossary
Chapter 1: Introduction	Overview
	Purpose of Environmental Impact Assessment
	Purpose of Scoping
	Purpose of this Scoping Report
	The Applicant
	Public Consultation
Chapter 2: The Proposed Development	Considerations of Alternatives
	Site Selection
	Screening of Sites for EIA
	Draft Project Design Envelope
Chapter 3: Consenting	Consultation
	Planning and Consenting Context
	META Consenting Strategy
Chapter 4: Approach to EIA	Legislative Framework
	Information Requirements
	Key Elements of the Approach to EIA
Chapter 5: Scope of the Assessment	Work to Inform EIA
	Topics Scoped out of the Assessment
	Content of the Environmental Statement
Chapter 6: Technical Assessment	Coastal Processes
	Benthic Subtidal and Intertidal Ecology
	Fish and Shellfish Ecology
	Marine Mammals
	Marine Ornithology
	Onshore Ecology
	Underwater Noise
	Onshore Noise and Vibration
	Commercial Fisheries
	Shipping and Navigation
	Historic Environment
	Marine Archaeology
	Landscape, Seascape and Visual Impact Assessment
	Socio-economic and Tourism
	Other Users
	Transport and Traffic
Chapter 7: Summary	Overview
	Consultation
	Next Steps

Chapter number	Chapter Topic
Chapter 8: References	References
Chapter 9: Appendices	Appendices

6 Technical Assessments

This Section provides an overview of the proposed approach to assessment for each of the technical Chapters to be included in the ES. For each Technical Chapter this Section will include the proposed Study Area, Baseline Information available, and Propose Approach to Assessment.

6.1 Coastal Processes

6.1.1 Introduction

This Chapter will provide an assessment on the potential effects of the proposed development, on coastal processes, during the installation, operational and decommissioning phases of the META Project.

6.1.2 Study Area

The coastal processes Study Area for the META project is defined as:

- The Milford Haven Waterway Study Area – defined as the area inclusive of the Waterway and extends up to the 12 nm limit, from St Govan's Head to Skomer Island (see Figure 6-1).

The Coastal Processes Chapter of the ES will assess the potential impact the activities associated with the installation, Operation and Maintenance, and decommissioning of the META Project will have on the Study Area.

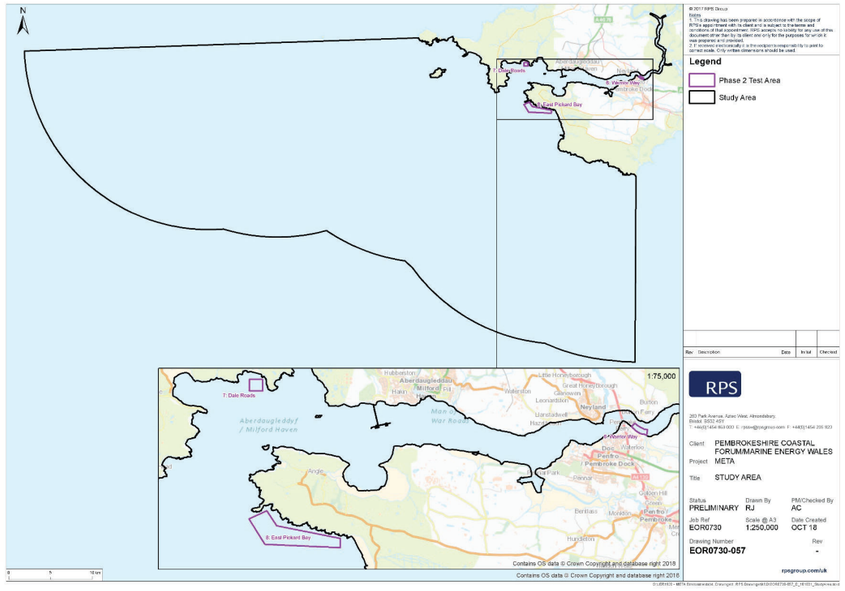

Figure 6-1 Coastal Processes Study Area

6.1.3 Baseline Information

Baseline Studies

The following desktop sources will be used to support the baseline characterisation and EIA on coastal processes:

- Information to support historic applications for maintenance dredging operations within the Waterway;
- Lavernock Point to St Ann's Head Shoreline Management Plan (Halcrow, 2012);
- Relevant coastal processes information from other developments in Milford Haven including South Hook LNG terminal and CHP station, Pembroke Power Station;
- Further review of sediment monitoring data (ABPmer Ltd *et al.,* 2010);
- Guidelines in the use of metocean data through the lifecycle of a marine renewables development (ABPmer *et al.*, 2008);
- Review of Cabling Techniques and Environmental Effects applicable to the Offshore Wind Farm Industry (BERR, 2008);
- Review of Round 1 Sediment process monitoring data - lessons learnt (ABPmer *et al.*, 2007);
- Dynamics of scour pits and scour protection - Synthesis report and recommendations (Whitehouse, R.; Harris, J.; Rees, J., 2008);
- Potential effects of offshore wind developments on coastal processes (Beiboer and Cooper, 2002); and
- All relevant primary, grey and review literature.

Milford Haven Waterway (the Waterway) Study Area

The Waterway is a deep-water macro-tidal ria believed to be created by the flooding of the Daugleddau river valley (which itself was formed by the merging of the tributaries of the Eastern and Western Cleddau), during the sea level rise at the end of the last Ice Age (Halcrow, 2012). It is the largest flooded valley in Europe and is also a historical deep-water anchorage. The Waterway has the capacity to be a large sediment sink, based on its morphology, however there is limited sediment input from offshore areas and the rivers flowing into the Waterway are not thought to contribute large volumes of sediment (Halcrow, 2012). Within the catchment are the two main rivers of the Western and Eastern Cleddau, which merge to form the Daugleddau before entering the Waterway. Pembroke River also flows into to the Waterway just west of Pembroke Dock.

Hobbs and Morgan (1992) describe the geomorphological processes that have resulted in the unusually high proportion of hard substrates within the Waterway, flanked by areas in which there are substantial thicknesses of mud. These areas of mud were derived from the rivers and have accumulated primarily in sheltered mudflats. Sediment transport along the frontage of the south shore of the Waterway is generally from west to east and tends to be finer sediments due to the generally low tidal currents in the estuary.

The high tidal range within Milford Haven means that water movements in the estuary are extensive. The tidal excursion (the horizontal distance along the estuary that a particle moves during one tidal cycle of ebb and flood) varies along the length of the estuary and is approximately twice as great for spring tides as for neap tides. Strong south-westerly winds, the prevailing wind direction for the Haven, can cause noticeable variations in the heights of the tide.

Warrior Way (site 6)

Warrior Way is situated entirely within the Pembrokeshire Marine/Sir Benfro Forol SAC, east of the Cleddau bridge, in a semi-diurnal tidal setting with a meso-tidal range. The tidal range propagates from the mouth of the Waterway up into the estuary, with high tide moving in a west to easterly

direction. The site supports the greatest tidal resource in the Milford Haven Estuary (1.2 m/s) and has a depth of between 16-19 metres chart datum[2] (CD). Currents are predominately flowing in an east to westerly direction as a result of the river flow from the eastern and western Cleaddau rivers that form a confluence and flow into Daugleddau river, constituting the Waterway.

Predominantly grey-green very fine to coarse-grained, plant-bearing sandstones, and red-brown and purple-brown siltstones make up the bedrock of the Warrior Way Site (Site 6). It is protected from high energy wave forces due to its location further up the estuary compared to Dale Roads and East Pickard Bay, which are present at the mouth of the estuary. However, Warrior Way is present on the outside of a meander, down river and at the mouth of Cosheston Pill entrance of the Daugleddau Estuary. Because of its location, sediment would be expected to be fine to course grained and dependent on fluvial deposits from the river and hydrodynamic processes (increase in flow would result in less fine sediments being present at site). Sediment is expected to be transported in an east to west direction down river.

Dale Roads (site 7)

Dale Roads is situated in a semi-diurnal tidal setting with a meso-tidal range, the tidal wave propagates from west to east (i.e. high tide occurs from the west and moves eastward into the estuary). The tidal range within the site is heterogenous. Currents are predominately determined by the tide flowing in and out of the Milford Haven in an east to west to east semi-diurnal cycle. Dale Roads supports depths of between 8 and 12 metres CD and benefits from a significant wind and wave fetch from the south and southwest.

Hard, red calcareous marls with sporadic red and green sandstones make up the geology of much of the Waterway. Basal beds of green marl, conglomerate and breccia are also present. Near the mouth of the Waterway at Dale Roads, which is exposed to the greatest wave action, the intertidal and subtidal areas are largely coarse sediments and bedrock. Dale Roads is situated within a bay and as such sediment transport is expected to migrate from the two peninsulas towards the centre of the bay.

East Pickard Bay (site 8)

Tidal range within the East Pickard Bay site remains fairly consistent with minimal variation throughout seasonal cycles. The predominate current runs from an east to west direction through the site, and a strong rip tide can be found at the south of Freshwater West Bay. East Pickard Bay is exposed to a good wave resource benefiting from a 200 km fetch from the prevailing wind direction and has a water depth of between 10 and 29 m CD.

The geology is comprised of hard, red calcareous marls with sporadic red and green sandstones. Basal beds of green marl, conglomerate and breccia are also present. East Pickard Bay is a high energy environment and as such sediments are primarily made up of coarse sediment types (gravel and sand). Within the vicinity of East Pickard bay site, the wave climate will be the main influence on offshore sediment transport rather than tidal currents due to the high energy environment. Bedload sediment transport is primarily moved from west to east and deposited on Freshwater West beach.

6.1.4 Designated Sites

All sites supporting Phase 2 activities are present within the Pembrokeshire Marine/ Sir Benfro Forol SAC (a Natura 2000 site) and as such are protected under the Habitats Directive (1992). The Annex I habitats that are a primary reason for selection of this site (JNCC, 2016) are:

- Estuaries;
- Large shallow inlets and bays; and

[2] The level below which depths are indicated and above which heights of the tides are expressed; usually mean level of low water at a spring tide.

- Reefs.

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site are:

- Sandbanks which are slightly covered by sea water all the time;
- Mudflats and sandflats not covered by seawater at low tide; and
- Coastal lagoons[3].

For Options 1-3 the onshore communications cable from the East Pickard Bay marine test area will make landfall within the Limestone Coast of South West Wales / Arfordir Calchfaen SAC. The Annex I habitats that are a primary reason for selection of this site are:

- Vegetated sea cliffs of the Atlantic and Baltic Coasts;
- Fixed coastal dunes with herbaceous vegetation (grey dunes).[3]

Annex I habitats that are a present as a qualifying feature but not a primary reason for selection of this site are:

- European dry heaths;
- Semi-natural dry grasslands and scrubland facies on calcareous substrates;
- Caves not open to the public; and
- Submerged or partially submerged sea caves.

For Option 4, the onshore communications cable from the East Pickard Bay offshore marine test are would make landfall with the Angle Peninsula Coast/Arfordir Penrhyn Angle SSSI, which is of special interest for its:

- Geology;
- Intertidal rock, sand and gravel communities
- Kelp, sea squirts and sea mats on tide-swept lower shore rock
- Serrated wrack and piddocks on lower mid-shore soft rock
- Specialised marine habitats (including rockpools, overhangs, cave and underboulder communities); and
- Population of roosting and feeding chough.

6.1.5 Proposed Approach to EIA

The baseline characterisation will discuss the physical environment at the META Project sites, within Milford Haven and along the wider Pembrokeshire coast. This will include a description of sediments, wave energy, tidal flows and sediment transport systems in the area. The baseline characterisation will draw on desktop information from the area including those outlined above (Section 6.1.3). In addition, site specific bathymetry and tidal and wave resource quantification data, which have been or are due to be collected by SEACAMS, will also be used to inform a robust baseline characterisation of the META Project sites and wider Study Area.

The EIA consider the potential effects of the installation, operational and decommissioning phases the Project in the vicinity of each META Project Phase 2 site, and within the wider Study Area. This will include the potential for changes to local tidal and wave conditions. Due to the relatively small scale of the devices (i.e. single devices, rather than full scale arrays) and the temporary and short-

[3] Priority feature

term nature of the deployments at META, it is anticipated that morphological beach response modelling will be required to support the EIA. RPS propose a robust evidence-based approach using existing reports and data from the wave and tidal sector in the UK and overseas, and expert judgement by our experienced coastal processes technical specialists.

The impact assessment will consider both direct and indirect potential impacts. These impacts are expected to be localised and short lived during the installation of the META Project equipment or marine energy devices, and highly localised during the operational phase of device testing activities. They will be assessed conceptually, based on an understanding of the local processes and the nature of the proposed activities. The impacts considered in the EIA for coastal processes are summarised in Table 6-1.

Assessment of Effects

The assessment will draw upon existing evidence available from other developments in the area and historic marine licence applications within the Study Area (outlined in 'baseline study'). This will consider the direct impacts of the development on the water quality and hydrodynamic regime of the Study Area. This in turn will be used to inform the EIA on marine ecological receptors (e.g. potential effect of increase in suspended sediment concentration (SSC) on marine mammal receptors).

Potential impacts scoped into the assessment are presented in Table 6-1.

Table 6-1: Impacts Proposed to be Assessed in the Coastal Processes EIA

Impact No.	Impact	Justification	Proposed Approach
Installation Phase			
1	Increases in SSC and deposition of disturbed sediment to the seabed within Warrior Way (site 6), Dale Roads (site 7) and East Pickard Bay (site 8).	Sediment disturbance may arise from a range of installation activities within the site, such as foundation installation and drilled pin pilling. Elevations in SSC and subsequent deposition of disturbed sediments have the potential to result in adverse and indirect impacts on a variety of receptor groups	There is now an evidence-base with regards to the potential environmental effects of marine renewable device anchoring (ABPmer *et al.*, 2008). This will be used in conjunction with spreadsheet-based tools (providing estimates of plume extent, concentration and associated changes in bed levels) to inform the assessment
2	Impacts to international and nationally designated sites.	Sediment disturbance may affect environmental receptors by increasing the amount of SSC present within designated sites.	There is now an evidence-base with regards to the potential environmental effects of marine renewable device anchoring (ABPmer *et al.*, 2008). This will be used in conjunction with spreadsheet-based tools (providing estimates of plume extent, concentration and associated changes in bed levels) to inform the assessment
3	Impacts to hydrodynamics, sediment transport	Cable installation activities at Freshwater West bay have the	The potential short term physical impact of cable installation at the landfall will

Impact No.	Impact	Justification	Proposed Approach
	and beach morphology at communications cable landfall (Option 1-3).	potential to impact the physical environment at the shoreline	be assessed based on desktop analysis and modelling. The nature and extent of any disturbance will be assessed with reference to the project description and the wider evidence base The potential impact will be assessed by an experienced coastal geomorphologist in the context of the baseline understanding of the landfall area
4	Increases in SSC and deposition of disturbed sediment on the seabed within the Waterway Study Area.	Increased sediment deposition on the seabed may adversely affect sediment-based habitats within the Study Area	The baseline will be supported with publicly available coastal monitoring data. These publicly available data will provide a robust evidence base with which to characterise the baseline physical environment at the landfall and enable potential impacts to be assessed
5	Release of contamination adsorbed to sediments disturbed, on ecological receptors	Contaminants including, asbestos, tin, polycyclic aromatic hydrocarbons, total petroleum hydrocarbons, tributyltin and dibutyltin, lead and hydrocarbons can be found adsorbed to sediments. These sediments can be re-suspended through anthropogenic sources and taken up by biota present in the Study Area	The baseline will be supported with publicly available chemical monitoring data. These publicly available data will provide a robust evidence base with which to characterise the baseline physical environment at the landfall and enable potential impacts to be assessed
6	Impact to superficial geology through cable installation	Cable route Option 4 is planned to be attached to the cliffs at East Pickard Bay. This may lead to impacts on superficial geology	This baseline will be supported with publicly available data. These publicly available data will provide a robust evidence base with which to characterise the baseline physical environment at the landfall and enable potential impacts to be assessed
Operational Phase			
7	Impacts to the wave regime, with	The interaction of operational marine	The baseline will be supported with publicly available coastal

Impact No.	Impact	Justification	Proposed Approach
	associated potential impacts along adjacent shorelines	energy devices and associated infrastructure and the wave regime may result in a reduction to wave energy. This in turn has the potential to impact upon adjacent coastlines and offshore sandbanks	monitoring data. These publicly available data will provide a robust evidence base with which to characterise the baseline physical environment at the landfall and enable potential impacts to be assessed qualitatively.
8	Impacts to international and nationally designated sites	Sediment disturbance may affect environmental receptors by increasing the amount of SSC present within the designated sites	An evidence-based approach will be used to determine the extent and impact of marine renewable devices. This will be used in conjunction with spreadsheet-based tools (providing estimates of plume extent, concentration and associated changes in bed levels) to inform the assessment.
9	Scour of seabed sediments	Interaction between the metocean regime (wave, sand and currents) and marine energy devices has the potential to cause localised scouring of seabed sediments leaving a depression around the structure(s)	A spreadsheet-based approach will be used to quantify the scale of the impact as follows. The likely dimensions of scour will be estimated using established empirical relationships available from the relevant literature and developer's marine renewable device specifications. The area of seabed modified either by scour or scour protection will be calculated
10	Impacts to sediment transport and sediment transport pathways	Foundations used for marine energy devices may interrupt sediment transport pathways	The potential for marine energy devices to interrupt or obstruct sediment transport will be assessed qualitatively by an experienced geomorphologist. The assessment will consider the realistic worst-case nature and dimensions of the marine energy devices as presented in the PDE, the seabed sediment type, and expected rates and directions of transport, and will use quantitative data to robustly describe the baseline scenario.
Decommissioning Phase			

Impact No.	Impact	Justification	Proposed Approach
11	Increases in SSC and deposition of disturbed sediment to the seabed within Warrior Way (site 6), Dale Roads (site 7) and East Pickard Bay (site 8)	Removal of marine energy devices and infrastructure may result in re-suspension of sediments	Methodology will follow the same assessment given in the installation phase
12	Impact to superficial geology through cable removal	Cable route Option 4 is planned to be attached to the cliffs at East Pickard Bay. This may lead to impacts on superficial geology	This baseline will be supported with publicly available data. These publicly available data will provide a robust evidence base with which to characterise the baseline physical environment at the landfall and enable potential impacts to be assessed

Knowledge of the baseline environment and the proposed activities have allowed impacts to be scoped out of the assessment where there is considered to be no receptor-impact pathway. These are outlined in Table 6-2.

Table 6-2: Impacts proposed to be scoped out of the coastal processes EIA

Impact No.	Impact	Justification
1	Potential impacts to "Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)" SAC interest.	No salt meadows are in the immediate vicinity of site installation, and as such impact will be avoided
2	Potential impacts to "Submerged or partially submerged sea caves" SAC interest	Due to the nature, scale, locations and duration of the proposed marine energy test deployments it is considered highly likely that there will be no impact on sea caves as a notified interest feature of the SAC. Testing will be positioned away from the coastal environment, therefore potential impacts on this SAC interest are predicted to be avoided

Potential Cumulative Impacts

The potential for the following projects or activities will be considered within the coastal processes Study Area (the maximum adverse scenarios for each of the projects will be assessed) for each META Project site supporting Phase 2 activities:

- Other META Project sites supporting Phase 2 activities;
- Offshore wind farms and associated cabling and infrastructure;
- Cables and pipelines;
- The Pembroke Dock Marine project;

- Other forms of cabling; and
- Beach replenishment schemes.

The Cumulative Effect Assessment (CEA) will consider the same impacts across all phases of the project, as outlined in Table 6-1.

6.2 Benthic Subtidal and Intertidal Ecology

6.2.1 Introduction

The Benthic Subtidal and Intertidal Ecology Chapter will provide an assessment of the potential impacts of the proposed META development during the installation, Operation and Maintenance, and decommissioning phases of the Project on benthic subtidal and intertidal habitats found within an appropriate Study Area.

6.2.2 Study Area

The benthic subtidal and intertidal Study Area is defined as the area (including intertidal) inclusive of the Waterway and extends up to the 12 nm limit, from St Govan's Head to Skomer Island. This has been informed by the Coastal Processes Study Area and has been selected to capture both direct and indirect effect of the development on benthic subtidal and intertidal receptors.

6.2.3 Baseline Information

Baseline Studies

An initial desk-based review of literature and data sources to support this Scoping Report has highlighted the following data sources which provide coverage of the Study Area:

- Historic mapping of intertidal and subtidal habitats within Milford Haven including mapping of intertidal habitats (RW; Brazier *et al.*, 2007; data from the Mapping European Seabed Habitats (MESH) mapping programme (EUSeaMap, 2016) and data from http://magic.defra.gov.uk;
- Data and reports from the Milford Haven Waterway Environmental Surveillance Group (the MHWESG) including Carey *et al.* (2015), Little *et al.* (2009) and Warwick (2006);
- Relevant marine ecological information presented in reports and data from developments within Milford Haven, including studies undertaken by RPS near Pembroke Power Station (RPS, 2007) and South Hook Liquid Natural Gas (LNG) terminal and Combined Heat and Power (CHP) station Development Consent Order (DCO) submission (RPS, 2013);
- Relevant historic information from MHPA, including maintenance dredging assessments (Hebog, 2006);
- NRW (historically Environment Agency Wales) WFD sediment monitoring data, comprising particle size analysis (PSA), within the Milford Haven Inner and Milford Haven Outer waterbodies (2007 to present);
- Background information on the features of SACs/SSSIs outlined in Table 6-3: from NRW supporting documents for those designated sites; and
- SAC Annex I feature maps such as the Lle Geo-Portal.

Specific subtidal surveys are not being proposed for the Benthic Subtidal and Intertidal EIA, however a recent intertidal survey was carried out at Freshwater West Bay, and will inform the EIA:

- Intertidal Survey carried out at Freshwater West Bay (October 2018).

This assessment will also be informed by other EIA Chapters such as Coastal Processes (Chapter 6.1).

The Study Area

The inner Milford Haven is dominated by A5.2 Sublittoral sand and A5.1 Sublittoral coarse sediment. The outer Milford Haven and wider Study Area is dominated by A5.1 Sublittoral coarse sediment, A3.1 Atlantic high energy infralittoral rock and A4.1 Atlantic high energy circalittoral rock. Intertidal reef is distributed through the Waterway and beyond, whereas subtidal reef can be found at the mouth and outer Waterway, as well as further offshore in the outer edges of the Study Area. Large areas of sandbank are found to the south and east of the Study Area (Lle Geo-Portal, 2018). Green crenella *Musculus discors* is found at the mouth of Milford Haven and blue mussel beds *Mytilus edulis* are found in the inner Milford Haven. Fragile sponge and anthazoans are also found sparsely distributed throughout the Study Area. Saline lagoons, salt marshes and seagrass beds are found throughout the Waterway.

Mudflats found in the inner Milford Haven support an extensive bed of nationally scarce dwarf eelgrass *Zostera notlei*, and the only know living maerl bed in Wales (excluding small amounts of maerl not constituting a bed) is found on the northern side of the outer Milford Haven (Bunker, 2010.

Hobbs and Smith (1998) found that the fauna of the Waterway could be divided into three relatively distinct regions arranged along the length of the Waterway and this related primarily to the balance between estuarine and marine conditions. Annelids were found to be the most abundant organisms in all three areas making up 75% of the individuals and, molluscs and crustaceans followed contributing 6 to 11% of the individuals. The stations upriver of the Cleddau Bridge were numerically dominated by tubificid oligochaetes and polychaetes. The middle stations were dominated by the cirratulid group consisting of *Chaetozone gibber* and *Caulleriella zetlandica* which made up over 50% of the individuals at some stations. A third group of species, characterised by other cirratulids (*Aphelochaeta*, *Tharyx* and *Caulleriella spp*.) and the bivalve *Abra alba* became more prominent toward the mouth of the Haven.

Warrior Way

Subtidal

The Waterway ESG commissioned a report in 2017 to review sediment macrobenthos data from 2008 to 2015 throughout the Waterway (Warwick, 2017). A total of eight survey stations were reviewed, the closest survey station being located approximately 3 km from the Warrior Way site. The most abundant species recorded were the polychaetes *Melinna palmata* and *Chaetozone gibber* and the crustaceans *Ostracoda* spp., *Ampelisca diadema,* and *Photis longicaudata.*

The LLe Geo-Portal for Wales Habitats Features Map shows that Annex I subtidal reefs are distributed within the Warrior Way site.

Intertidal

A survey of rocky intertidal shores within the Waterway was carried out by the Marine Biological Association (MBA) for the Waterway ESG in 2010 (Miesskowska, 2011). A total of six sites were selected throughout the Waterway with one site based at Llanreath, approximately 3 km south west of Warrior Way and one site based at Cosheston Folly, approximately 1.5 km north east of Warrior Way.

The Llanreath site is in the lee of Carrs Rock, with a very sheltered, flat shore with long, narrow old Sandstone bedrock ridges running down the shore; the Cosheston Folly site is a very sheltered shore on Old Red Sandstone. The results of the study indicate that within this area, the upper shore is characterised by the brown seaweeds *Pelvetia canaliculate* and *Ascophyllum nodosum*; barnacles and the occasional limpet. The mobile upper shore communiacty is domincated by gastropods. Limpets and barnacles dominated the mid shore zone, with mussels *Mytilus* spp. and limpets most abundant on the cobble/shingle midshore habitat. The lower shore cobble and boulder area of Cosheston Folly had a much richer community with respect to both algae and invertebrates.

The results of a rocky shore assessment conducted throughout the Waterway (Morrell, 2014) were in line with the study conducted by Miesskowska (2011). A map of intertidal habitats at Warrior way can be seen in Figure 6-2.

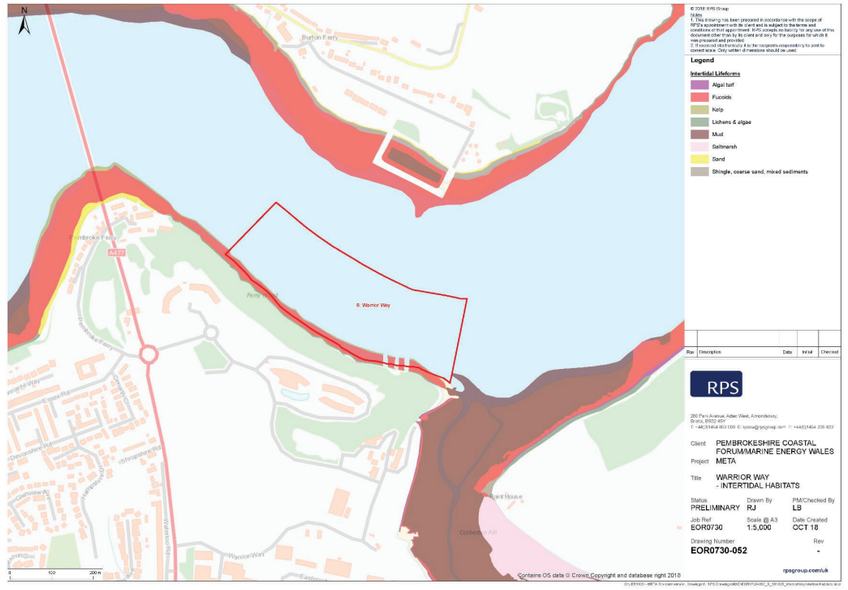

Figure 6-2: Intertidal Habitats at Warrior Way

Dale Roads

The Dale Roads site lies within the Waterway to the west of Great Castle Head, and south of St Ishmael's.

Subtidal

There are two populations of the subtidal seagrass *Zostera marina* within the Waterway. The largest of which lies 2 km to the east of the Dale Roads site, located in Littlewick Bay on the north side of the Haven. The smaller population of *Zostera* lies approximately 1 km to the north east of Dale Roads in Longoar Bay.

A well-established maerl bed lies 2 km to the east of Dale Roads, in the vicinity of Littlewick Bay to Stack Rock. The is the only know living maerl bed in Wales, excluding small amounts of maerl not constituting a bed. Maerl is legally protected under several designations including the EC Habitats Directive(92/43/EEC) as amended 2010 on the Conservation of Natural Habitats and of Wild Fauna and Flora, the UK BAP for the diversity of flora and fauna (1994), and the Welsh Governments Habitats and Species of Principal Importance for Wales list. The maerl bed constitutes as an Annex I Habitat important feature of Pembrokeshire Marine/ Sir Benfro Forol SAC. Seagrass and maerl populations can be seen in Figure 6-4.

Intertidal

The site survey at Great Castle Head which was conducted by Morell in 2014 is approximately 0.5 km from Dale Roads site. The survey found that the shore was dominated by barnacles, the most common species being *Semibalanus balanoides*.

Intertidal reef habitat is found throughout the Dale Roads area, and sea caves are located on the east coast of Great Castle Head. Sandflats are supported at Lindsway Bay, into which the Dale Roads site crosses. A map of intertidal habitats at Dale Roads can be seen in Figure 6-3.

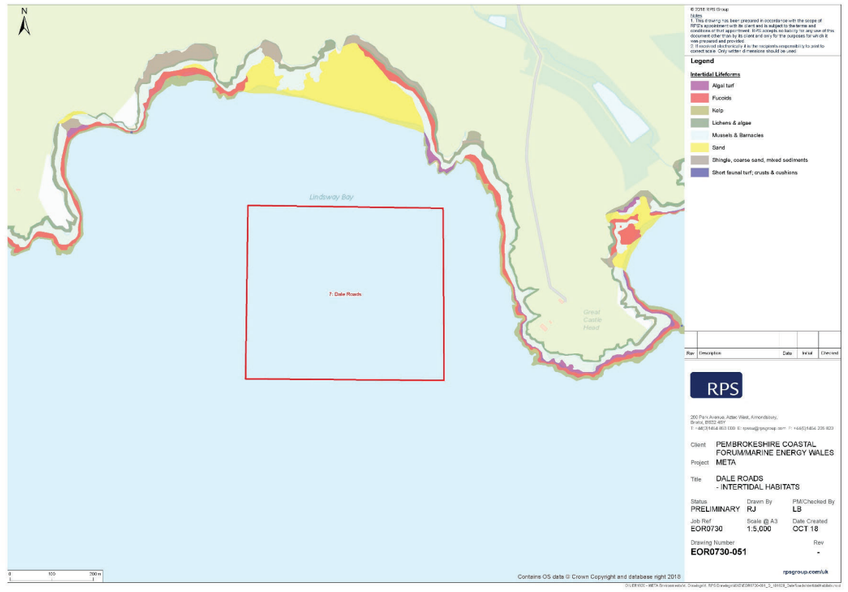

Figure 6-3: Intertidal Habitats at Dale Roads

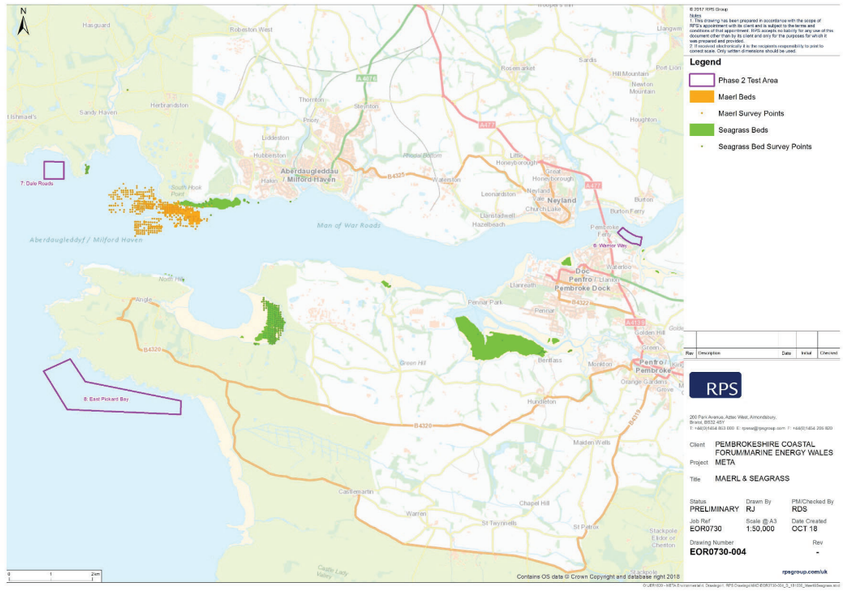

Figure 6-4: Maerl and Seagrass Populations in MHW

East Pickard Bay

The northern side of the East Pickard Bay site is located within the Waterway, immediately south of Sheep Island and runs south-eastward parallel to the coast towards Freshwater West Bay.

Subtidal

The predominant biotope from the mean low-water mark up to the East Pickard Bay site is kelp with cushion fauna and/or foliose red seaweeds on wave exposed Atlantic infralittoral rock (A3.11) and deep circalittoral coarse sediment (A5.14). The A3.11 habitat typically supports a community of kelp *Laminaria hyperborea* with foliose seaweeds. The faunal and floral understorey is generally rich in species due, in part, to the relatively low urchin grazing pressure in such shallow exposed conditions. As the exposure increases the rock surface can be covered by a dense turf of anthozoans such as *Sagartia elegans, Phellia gausapata* and *Corynactis viridis*, encrusting sponges and coralline algae (Gubbay *et al.*, 2016). The A5.14 habitat typically supports communities of polychaete and bivalve species; populations of *Modiolus modiolus* larvae may settle within this habitat forming reef beds if maturity is reached.

Intertidal

A site-specific intertidal survey on Freshwater West Beach (RPS, 2018) showed that the south of Freshwater West beach is bordered by littoral rock comprising of a matrix of *Fucus serratus* and red seaweeds on moderately exposed lower eulittoral rock. Predominant species present were *Fucus vesiculosus, Ulva spiralis, Ulva lactuca, Ascophyllum nodosum* and common limpets *Patella vulgata*.

The entire beach at Freshwater West, from the littoral rock south to the littoral rock north, below the mean high-water mark was classified as littoral sand. Above the mean high-water mark, the biotope was classified as barren littoral shingle and typical sediment was a mixture of coarse and fine sands.

To the north of Freshwater West beach, the littoral rock was dominated by mussel and barnacle communities, and yellow and grey lichens. Predominant species found were *F. vesiculosus, A. nodosum, P. vulgate,* barnacles *Cirripedia* spp. and *Actinia equina.*

A review of EMODnet seabed habitats biotope map, from data collected by NRW, found similar biotopes as to the survey above (EMODnet, 2018). However, biotope names on the EMODnet seabed habitats biotope map are yet to be updated. A map of intertidal habitats at East Pickard Bay can be seen in Figure 6-5.

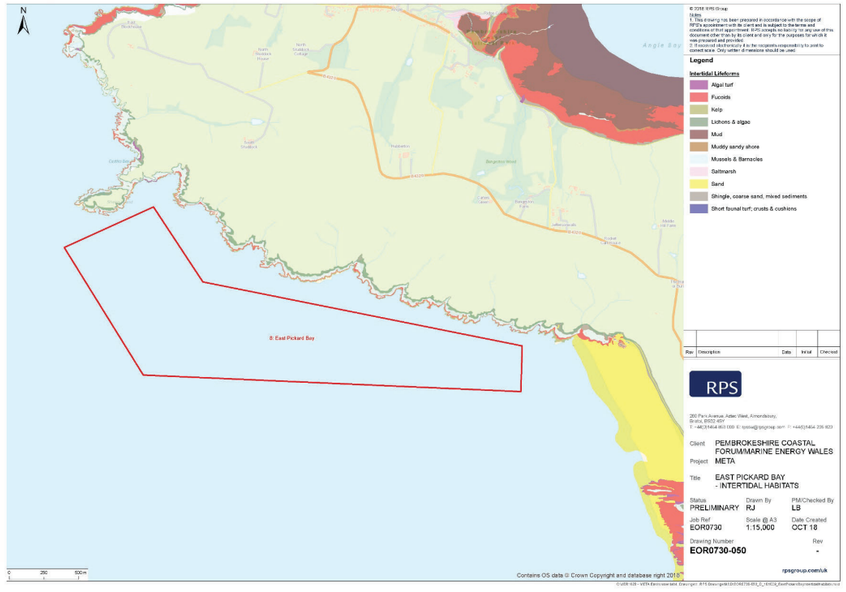

Figure 6-5: Intertidal Habitats at East Pickard Bay

6.2.4 Designated Sites

A number of internationally and nationally designated areas occur within the benthic subtidal and intertidal ecology Study Area, with relevant benthic habitats. These sites are shown in Figure 6-6 and a summary of their relevant qualifying features is presented in Table 6-3.

The key sites of relevance to the assessment will be:

- Pembrokeshire Marine/Sir Benfro Forol SAC;
- Limestone Coast of South West Wales/ Arfordir Calchfaen de Orllewin Cymru SAC;
- Milfrod Haven Waterway SSSI; and
- Angle Peninsula Coast SSSI.

Table 6-3: Designated Sites and Relevant Qualifying Features for Marine Habitats

	Closest Distance to META sites (km)			
Designated Site	**Warrior Way**	**Dale Roads**	**East Pickard Bay**	**Relevant Notified Interest Benthic Features (those features shaded in grey will not be considered due to lack of receptor-impact pathway)**
Pembrokeshire Marine / Sir Benfro Forol SAC	0	0	0	Annex I Habitats • Estuaries • Large shallow inlets and bays • Reefs • Sandbanks which are slightly covered by sea water all the time • Mudflats and sandflats not covered by seawater at low tide • Coastal lagoons • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) • Submerged or partially submerged sea caves
Limestone Coast of South West Wales/ Arfordir Calchfaen de Orllewin Cymru SAC	10	6.5	2	• Submerged or partially submerged sea caves • Caves not open to the public
Milford Haven Waterway SSSI	0	< 0.1	2.2	• Estuaries (contains all shore types and communities) • Specialised marine habitats (including eelgrass beds, rockpools,

Designated Site	Closest Distance to META sites (km)			Relevant Notified Interest Benthic Features (those features shaded in grey will not be considered due to lack of receptor-impact pathway)
	Warrior Way	Dale Roads	East Pickard Bay	
				overhangs and underboulder communities) • Sand gapers and bristle worms in muddy gravel shores • Bristle worms in poorly sorted mixed sediment shores • Bristle worms in variable salinity muddy gravel shores • Serrated wrack, sponges and sea-squirts on tide-swept lower mid-shore rock • Serrated wrack with sponges, sea-squirts and red seaweeds on tide-swept lower mid-shore mixed substrata • Kelp, sea-squirts and sea mats on tide-swept subtidal fringe rock • Oyster beds on shallow subtidal muddy sediment • Saltmarsh (including Atlantic salt meadows) • Reedbeds • Semi-natural ancient woodland • Saline lagoons • Marsh pea • Spurge-laurel • Wayfaring tree • Dwarf eelgrass • Assemblage of coastal flowering plants • Assemblage of saltmarsh and intertidal flowering

Designated Site	Closest Distance to META sites (km)			Relevant Notified Interest Benthic Features (those features shaded in grey will not be considered due to lack of receptor-impact pathway)
	Warrior Way	Dale Roads	East Pickard Bay	
				plants Assemblage of mosses and liverworts • Assemblage of nationally rare and scarce lichens • Shelduck • Wigeon • Teal • Curlew • Dunlin • Little grebe • Otter • Tentacled lagoon worm • Brown hair-streak butterfly • Assemblage of saltmarsh invertebrates • Greater horseshoe bats • Lesser horseshoe bats • Geology: Non-marine Devonian - Little Castle Head
Angle Peninsula Coast SSSI	13	2.3	< 0.1	• Intertidal rock, sand and gravel communities. • Kelp, sea squirts and sea mats on tide-swept lower shore rock • Serrated wrack and piddocks on lower mid-shore soft rock • Specialised marine habitats (including rockpools, overhangs, cave and underboulder communities) • Chough • Geological exposures - Quaternary of Wales,

Designated Site	Closest Distance to META sites (km)			Relevant Notified Interest Benthic Features (those features shaded in grey will not be considered due to lack of receptor-impact pathway)
	Warrior Way	Dale Roads	East Pickard Bay	
				• Geological exposures - Devonian (non-marine)

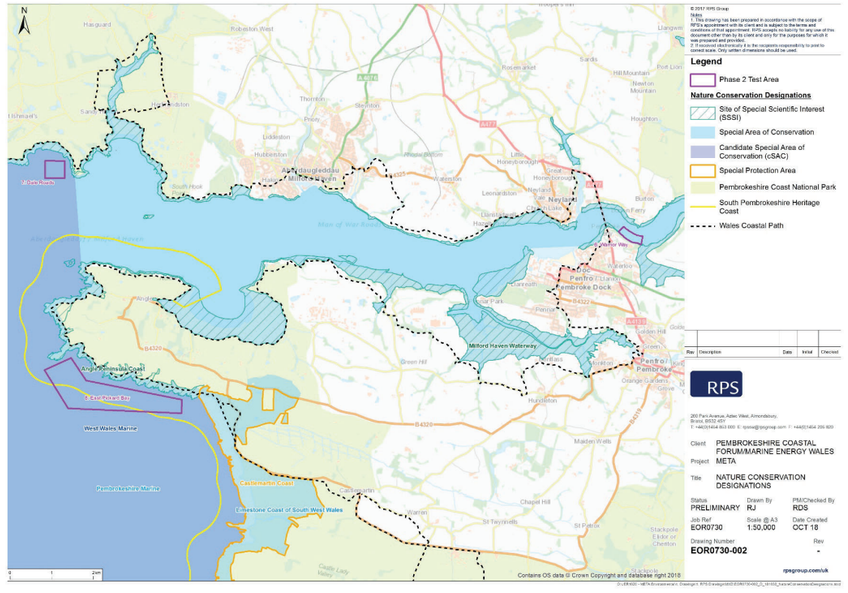

Figure 6-6: Conservation Designations for the META Project

6.2.5 Proposed Approach to EIA

The EIA will consider the potential effects of the installation, operation/maintenance and decommissioning phases of the META Project within the benthic subtidal and intertidal ecology Study Area. The assessment methodology will consider the most recent Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment in the UK and Ireland (2018). In addition, the EIA approach will take note of the legislative requirements of the Offshore Marine Conservation Regulations 2007 (Offshore Habitats Regulations) (as amended), the Conservation of Habitats and Species Regulations 2010 (Habitats Regulations) (as amended), the WCA 1981 (as amended) and the Marine and Coastal Access Act 2009 (as amended).

For the purposes of conducting the EIA, all marine habitats and species identified as having the potential to occur in the vicinity of the proposed development will be categorised as VERs against which impacts associated with the installation and operation of the proposed development will be assessed (Table 4-1).

The impacts to be considered in the EIA are outlined below, although these would be expected to be localised and short lived during the installation phase and highly localised during the operational phase. These impacts will be assessed using desk-based information drawing upon existing evidence available from other developments in the area and historic marine licence applications within the Waterway. This Chapter will consider impacts during the installation, Operation and Maintenance, and decommissioning phases of the Project. The impact assessment will consider both direct impacts of the development on marine habitats (e.g. habitat loss/disturbance due to installation activities and/or presence of structures during operation) and indirect impacts (e.g. effects on water quality due to increases in SSCs, resuspension of sediment bound contaminants, if any) on marine habitat receptors, with a list of the potential impacts on marine habitat receptors presented below. The effects of changes in energy although not likely to be high, will be considered in the outputs of the Coastal Processes EIA (See Section 6.1.5 for Coastal Processes Proposed Approach to EIA).

Assessment of Effects

Table 6-4 below shows potential impacts on benthic subtidal and intertidal ecology receptors that have been identified for the marine works associated with the proposed development for marine habitats and will be assessed in the ES. Impacts to be scoped out can be seen in Table 6-5.

Table 6-4 Impacts to be Assessed in the Benthic Subtidal and Intertidal Ecology EIA

Impact No.	Impact	Justification	Proposed Approach
Installation, Operational and Decommissioning Phases			
1	Temporary disturbance to intertidal and subtidal habitats	Temporary disturbance to habitats may arise during the installation and decommissioning phases, such as foundation installation and drilled pin pilling. Disturbance may also arise during operational phase through the deployment of anchor points	The assessment will use available data to quantify the likely extent of habitat disturbance and the associated likely impacts of disturbance on intertidal and subtidal habitats
2	Effects of increases in SSCs and associated sediment deposition on	Sediment disturbance may arise from a range of installation and decommissioning activities, such as foundation installation and drilled pin pilling.	This assessment will be informed by the output of the Coastal Processes EIA (see 6.1.5 for proposed approach to Coastal Processes EIA)

Impact No.	Impact	Justification	Proposed Approach
	intertidal and subtidal habitats	Disturbance may also arise during operational phase through the deployment of anchor points. Elevations in SSC and subsequent deposition of disturbed sediments have the potential to result in adverse and indirect impacts on a variety of receptor groups	
3	Potential for resuspension of contaminated sediments with effects on benthic subtidal and intertidal receptors	Uncontrolled resuspension of contaminated sediments can remobilise weakly bound heavy metals into surrounding water and could pose a potential risk to benthic habitat	The assessment aims to use available data to identify the expected levels of contaminated sediment, the likelihood of the impact occurring, and the likely impact of resuspension of contaminated sediments on benthic receptors
4	Risk of introduction of INNS	Increased vessel traffic, introduction of infrastructure and devices could result in the introduction of invasive non-native species to the area, with the potential for adverse effected on benthic receptors	The assessment aims to use available data, to identify the pathways for, and likely impact of the introduction of INNS to the area. The assessment will take into account guidance such as the IMO Ballast Water Management (BWM) Guidelines; the NRW Marine Biosecurity Planning guidance; the International Convention for the Control and Management of Ships' Ballast Water and Sediments (the Ballast Water Management Convention); and the Pembrokeshire Nature Partnership Species Action Plan: INNS

Knowledge of the baseline environment and the proposed activities have allowed impacts to be scoped out of the assessment where there is considered to be no receptor-impact pathway. These are outlined in Table 6-5.

Table 6-5 Impacts Proposed to be Scoped Out of the Benthic Subtidal and Intertidal Ecology EIA

Impact No.	Impact	Justification
1	Effects of accidental release of pollutants (e.g. accidental spillage) on benthic species and	The potential for accidental pollution will be managed by the EMMP, therefore the likelihood of an accidental spill occurring is highly

Impact No.	Impact	Justification
	habitats across all phases of the project	unlikely. As such the effects on benthic ecology are proposed to be scoped out of the EIA

Potential Cumulative Impacts

The following projects or activities will be considered within the Study Area (the maximum adverse scenarios for each of the projects will be assessed) for the META Project:

- Other META Project sites;
- Cables and pipelines;
- The Pembroke Dock Marine project; and
- Other forms of cabling.
- Beach replenishment schemes:
- Other forms of cabling (i.e. telecommunications and interlinks);
- Commercial fishing activity;
- Shipping and navigation;
- The Pembroke Dock Marine development;
- Aggregate extraction and disposal of dredging spoil; and
- Redevelopment of the Milford Haven area.

The CEA will consider the same impacts across all phases of the project.

6.3 Fish and Shellfish Ecology

6.3.1 Introduction

This Section of the Scoping Report identifies the fish and shellfish ecology resources of relevance to the META Project, and considers the potential impacts from the installation, Operation and Maintenance, and decommissioning of the Project on fish and shellfish ecology.

6.3.2 Study Area

Fish and shellfish are spatially and temporally variable, therefore, for the purpose of the META Project fish and shellfish ecology EIA, the Waterway Study Area has been identified as inclusive of the coastal waters to the west of Milford Haven up to the 12 nm limit (including Freshwater West Bay), in order to capture the relevant sensitive receptors.

6.3.3 Baseline Information

Baseline Studies

Specific to the Fish and Shellfish Ecology EIA, the following guidance documents will also be considered:

- Guidelines for Ecological Impact Assessment (EcIA) in Britain and Ireland. Marine and Coastal, Final Document (IEEM, 2010);
- Offshore Wind Farms. Guidance note for EIA in respect of FEPA and CPA requirements (Cefas, 2004);
- Guidelines for data acquisition to support marine environmental assessments of offshore renewable energy projects (Judd, 2012);

- Guidance on Environmental Considerations for Offshore Wind Farm Development (OSPAR, 2008);
- Historic and baseline studies as well as primary, grey and review literature; and
- Data obtained from WFD seine, otter, beam and fyke trawl surveys undertaken by NRW in the Waterway transitional and coastal waterbodies since 2004.

In addition, the Fish and Shellfish Ecology EIA will follow the legislative framework as defined by the Offshore Marine Conservation (Natural Habitats, and c.) Regulations 2007 (Offshore Habitats Regulations) (as amended), the Conservation of Habitats and Species Regulations 2010 (Habitats Regulations) (as amended), the WCA 1981 (as amended) and the MCAA 2009 (as amended).

Milford Haven Waterway Study Area

Seine and fyke net surveys undertaken by NRW in the Waterway Inner WFD transitional waterbody (i.e. upriver of the Cleddau Bridge) since 2004 have predominantly recorded gobies *Pomatoschistus spp*, sand smelt *Atherina presbyter* and sea bass *Dicentrarchus labrax,* with lower numbers of clupeids including sprat *Sprattus spattus* and herring *Clupea spp*. Three species of mullet - thick lipped *Chelon labrosus*, thin lipped *Liza ramada* and golden grey *Liza aurata* - were regularly recorded, albeit in low numbers. Ballan wrasse *Labrus bergylta* and 15-spined stickleback *Spinachia spinachia* have also been occasionally recorded. Species of conservation interest which have been recorded in the seine and fyke net surveys, albeit extremely rarely, include Atlantic salmon *Salmo salmar*, sea trout *Salmo trutta* and European eel *Anguilla anguilla*.

The otter trawl surveys conducted by NRW in the Milford Haven Waterway outer coastal waterbody, as expected for a different trawl method in an area further towards the mouth of the Waterway, have typically recorded a different assemblage of species, although the captures from the trawl survey also appear to have been dominated by gobies. The otter trawls have also recorded demersal species including plaice *Pleuronectes platessa*, flounder *Platichthys flesus* and solenette *Buglossidium luteum*.

Data is limited for the Milford Haven Waterway south coastal transitional waterbody within the vicinity of East Pickard Bay. However, conditions are similar to the Milford Haven Waterway outer coastal waterbody and as such, the fish ecology would be expected to be similar in community structure.

Spawning and Nursery Grounds

Juvenile fish assessments DEFRA (Riley *et al.,* 1986) indicate that most parts of the Waterway support juvenile flatfish, particularly dab and plaice, but also brill and turbot, with an above average abundance of dab and plaice when compared to figures for England and Wales. Survivors of the first-year fish remain in the Waterway for at least a second year. The majority will leave on reaching sexual maturity. The Waterway is also recognised as a minor nursery area for flatfish (National Rivers Association, 1992).

Herring spawn at three gravel sites in the Daugleddau (Crothers, 1966; Clarke and King, 1985 in Hobbs and Morgan 1992) although positions vary from year to year according to gravel availability (Figure 6-7). It is estimated by Clarke (1981) in Hobbs and Morgan (1992), that approximately 16 million fish spawned off Burton Point during February and March 1981 and that it is likely that herring (as roe, larvae and young fish) are probably an important food source to the fauna of the Milford Haven area for at least three to four months of the year. During spawning it has been estimated that 100 tons or more of roe are deposited on the estuary floor, providing a rich diet for demersal fish, crabs and other scavengers. During the spawning season herring larvae and young fish will migrate up and down the estuary and constitute prey to a range of species at different stages of their development.

The Pembroke River and the tidal waters of the Daugleddau upstream of the Cleddau Bridge have been identified as bass nursery areas (NRA, 1991), as has an area in Pembroke Bay around the old power station outfall (Pawson *et al.*, 2002). In these areas, fishing is prohibited between 1st May

and 31st October. The extent of the bass nursery area would indicate that the spawning area is fairly extensive (Fawley Laboratories EIA, 1995) (Figure 6-8).

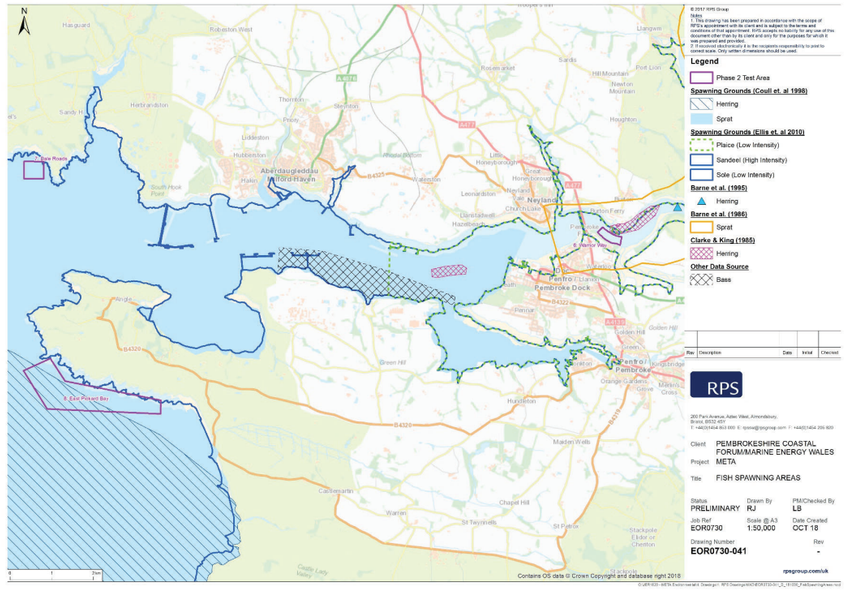

Figure 6-7: Spawning grounds within the Milford Haven Waterway

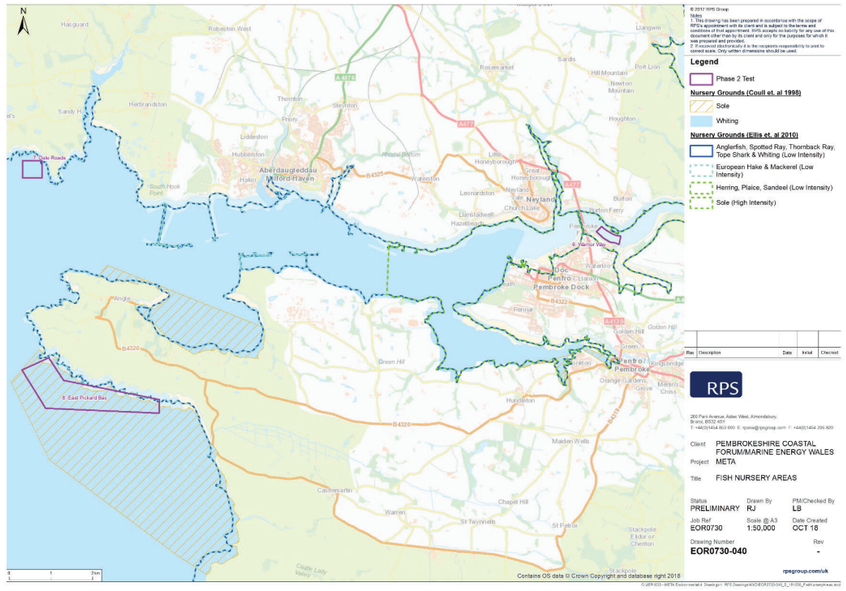

Figure 6-8: Nursery grounds within the Milford Haven Waterway

Shellfish

Historically, the Waterway has been harvested for cockles *Cerastoderma edule* and Pacific oyster *Crassostrea gigas,* and in recent years the fisheries market has grown to include permits for carpet shell clams *Ruditapes decussatus*, razors *Pharidae* spp. and native oysters *Ostrea edulis*. The large area, diverse marine habitats and sediment types, results in a variety of shellfish species. These include the native oyster, edible mussels *Mytilus edulis*, lobsters *Homarus gammus* and prawn *Palaemon serratus*, some of which have conservation and commercial interests.

Due to the specificity and sensitivity, the native oyster has been classified as a threatened species and is covered by a UK BAP. The species is of principal importance for the purpose of conservation of biodiversity under the NERC Act 2006 and is on the OSPAR list of threatened and/or declining species. Native oysters are widespread throughout the Waterway with stocks present from Milford Haven town up to Picton Point. Native oyster beds upstream of the Cleddau Bridge from Burton to Llangwm are sufficiently productive to support a fishery and are dredged commercially especially at the known points of relative abundance at Lawrenny, Beggars Reach and Black Tar (Hobbs and Morgan, 1992).

Mussel *M. edulis* beds are classed as a UK BAP Priority Habitat and currently on the OSPAR List of threatened and/or declining species and habitats. Blue mussel *M. edulis* beds can also be key features of habitats listed in Annex I of the Habitats Directive. Wild stocks of mussels *M. edulis* are present in patches throughout the Waterway, either present on rocky shores or raised beds acting as 'nursery' areas for larvae. The main raised beds are found between the Cleddau Bridge and Picton Point at Lawrenny Quay, Coedcanlas and Sprinkle Pill. Jenkins Point, at the confluence of the Daugleddau the Carew and the Creswell Rivers, and Mount Pleasant are both Class B mussel beds (Chapter 6.9 and Figure 6-14).

Pawson *et al.* (2002) describe the Pembrokeshire coast as a valuable potting ground. Potting for lobster, green shore crab, spider crab and velvet crab is common in the Waterway. Within the Waterway, lobsters can be found as high up-stream as Lawrenny Quay. Lobsters in the Waterway have been noted as breeding, with evidence of the populations extending as far as Lundy in the Bristol Channel.

Spider crabs have been recorded within the Waterway Estuary, from Angle Bay up to Milford Haven Dock, with sightings around the coast of Pembrokeshire. Spider crabs generally feed on algae present on rocky substrata.

The velvet crab is a commonly occurring species whose distribution ranges from the lower intertidal/sublittoral fringe to depths of 80 m on rocky substrata (Clark, 1986). The species has an affinity for rocky substrata and is widespread around the UK coastline. Therefore, it is reasonable to assume that the species will occur in the Waterway.

Green (shore) crabs can be found on all types of shores, from high water to depths of 60 m in the sublittoral. Green crabs have been found throughout the year in the Waterway and are abundant intertidally come spring. Shrimp have also been found within the Waterway on the seafloor, up to Lawrenny Quay.

6.3.4 Designated Sites

The Pembrokeshire Marine/ Sir Benfro Forol SAC is situated within Milford Haven Waterway Study Area and provides a varied habitat of hard and soft substrates to support a wide variety of fish species, which is further enhanced by the presence of artificial structures such as jetty piles, docks, localised beds of seagrass (*Zostera* spp.), and other aquatic vegetation (macrophytes). Species found are described to be typical of those expected for an estuary of this type. In general, a major increase in fish abundance in estuaries around South Wales has been recorded since the early 1980s due to a greater abundance of warm water species, although this dramatic increase is at the expense of cold water fish suggesting that global warming and increases in sea level temperature is responsible (Henderson and Seaby, 2001).

The SAC has several Annex II species present as a qualifying interest feature of which four species are fish:

- Sea lamprey (*Petromyzon marinus*);
- River lamprey (*Lampetra fluviatilis);*
- Allis shad (*Alosa alosa*); and
- Twaite shad (*Alosa fallax*).

112 fish species have been recorded within the Pembrokeshire Marine/ Sir Benfro Forol SAC, 82 of which were recorded by Crothers (1966) in Milford Haven Waterway Study Area.

The fish and shellfish species commonly occurring in the Waterway, together with species of conservation importance (i.e., Annex II species and species listed by OSPAR as threatened or declining) are listed in Table 6-6.

Table 6-6: Finfish species potentially present in the *Waterway* with specific conservation and or environmental sensitivities. juv. = juvenile, v = vulnerable, nt = near threatened, ce = critically endangered.

Common name	Scientific name	Legislation / environmental sensitivity					
		Diadromous fish passing through Milford Haven	Annex II of the EU Habitats Directive	BAP species	OSPAR	IUCN Red List	Bern Convention Appendix III
15-spined stickleback	*Spinachia spinachia*						
Allis shad	*Alosa alosa*	x	x	x	x		x
Atlantic salmon	*Salmo salmar*	x	x	x	x		
Ballan wrasse	*Labrus bergylta*						
Bib	*Trisoptreus luscus*						
Cod	*Gadus morhua*			x	x	x (v)	
Corkwing wrasse	*Crenilabrus melops*						
Dragonet	*Callionymus sp.*						
European eel	*Anguilla anguilla*	x		x	x	x (ce)	
Golden grey mullet	*Liza aurata*						
Greater pipefish	*Syngnathus acus*						
Haddock	*Melanogrammus aeglefinus*					x (v)	
Herring	*Clupea harengus*			x			
Plaice	*Pleuronectes platessa*			x			
Pollack	*Pollachius pollachus*						
Red mullet	*Mullus surmuletus*						
River lamprey	*Lampetra fluviatilis*	x	x	x	x		x
Saithe	*Pollachius virens*						
Sand gobies	*Pomatoschistus spp.*						
Sand smelt	*Atherina presbyter*						
Sea bass	*Dicentrachus labrax*						

Common name	Scientific name	Legislation / environmental sensitivity					
		Diadromous fish passing through Milford Haven	Annex II of the EU Habitats Directive	BAP species	OSPAR	IUCN Red List	Bern Convention Appendix III
Sea lamprey	*Petromyzon marinus*	x	x	x	x		x
Sea trout	*Salmo trutta*	x		x			
Snake pipefish	*Entelurus aequoreus*						
Sole	*Solea solea*						
Sprat	*Sprattus sprattus*						
Thick lipped mullet	*Chelon labrosus*						
Thin lipped mullet	*Liza ramada*						
Thornback ray	*Raja clavata*				x	x (nt)	
Twaite shad	*Alosa fallax*	x	x	x	x		
Whiting	*Merlangius merlangus*			x			

6.3.5 Proposed Approach to EIA

The EIA will consider the potential effects of the installation, Operation and Maintenance, and decommissioning of the Project, in the vicinity of each site supporting Phase 2 activities, and within the Waterway Study Area. The impact assessment will consider both direct and indirect potential impacts. These impacts are expected to be localised and short lived during the installation of META equipment or marine energy devices, and highly localised during the operational phase of device testing activities. They will be assessed based on an understanding of the local fish density and community structure and the nature of the proposed activities. The impacts to be considered in the EIA for fish and shellfish ecology are summarised in Table 6-7.

Assessment of Effects

For the purposes of conducting the EIA, a number of ecological receptors will be identified within the Waterway fish and shellfish Study Area, based on the baseline characterisation. Impacts associated with the installation, Operation and Maintenance, and decommissioning of the Project will be assessed against this baseline characterisation. A valuation of the importance of each receptor within the Waterway Study Area will then be made using the criteria presented in Table *6-7*. This assessment will be based on a qualitative assessment of the following:

- Species population present within the Milford Haven Waterway Study Area;
- Species spawning, nursery and migratory behaviour within the Milford Haven Waterway Study Area; and
- Species commercial, conservation and ecological interest, including importance in supporting species to higher trophic levels (e.g. prey species for bird and marine mammal species).

Table 6-7: Impacts to be assessed in the fish and shellfish EIA

Impact No.	Impact	Justification	Proposed approach
Installation Phase			
1	Temporary habitat loss/ disturbance	There is potential for temporary, direct habitat loss and disturbance due to cable laying operations (including anchor placements), device placement on seabed, pin pilling and use of marine vessels.	Given the detail, coverage and contemporary nature of fish ecology information available from a variety of desk studies and site-specific sources, the fish and shellfish baseline will be considered as robustly characterised. Therefore, no further site-specific fish surveys to inform the Study Area are proposed. The assessment will consider the sensitivity of species to disturbance and habitat loss within the study area.
2	Temporary increases in suspended sediments	Sediment disturbance arising from installation of the communications cable and of devices may result in adverse and indirect impacts on fish and shellfish receptors.	Following the Coastal Process modelling, the EIA will use this information on sediment disturbance to determine the impact of suspended sediments on sensitive species.
3	Sediment deposition	There is potential for sediment deposition/smothering of fish and shellfish habitats as a result of sediment plumes generated during installation activities (e.g. cable and foundation installation).	As above for fish and shellfish impact no. 2
Decommissioning Phase			
4	Temporary habitat loss/ disturbance	There is potential for temporary, direct loss and disturbance to fish and shellfish habitats due to operations to remove array and export cables, and device foundation removal.	As above for fish and shellfish ecology impact no. 1
5	Temporary increases in suspended sediments	Sediment disturbance arising from decommissioning activities (e.g. foundation removal) may result in adverse and indirect impacts	As above for fish and shellfish ecology impact no. 2

Impact No.	Impact	Justification	Proposed approach
		on fish and shellfish receptors.	
6	Sediment deposition	There is the potential for sediment deposition as a result of device foundation removal.	As above for fish and shellfish ecology impact no. 2
7	Removal of hard structures	The removal of foundations and scour/cable protection during decommissioning has the potential to reduce habitat complexity.	As above for fish and shellfish ecology impact no. 1
8	Temporary seabed disturbance	The removal of foundations and scour/cable protection during decommissioning has the potential to reduce habitat complexity.	As above for fish and shellfish ecology impact no. 1

Knowledge of the baseline environment and the proposed activities have allowed impacts scoped out of the assessment, where there is considered to be no receptor-impact pathway (Table 6-8).

Table 6-8: Impacts proposed to be scoped out of the fish and shellfish EIA

Impact No.	Impact	Justification
Installation and Decommissioning		
1	Underwater noise	Installation and decommissioning of the marine renewable devices will result in noise levels lower than ambient noise levels experience within the fish and shellfish study area.
Operation and Maintenance		
2	Colonisation of hard structures	The introduction of man-made structures on the seabed (foundations, scour/cable protection and marine renewable devices) may lead to effects on fish and shellfish receptors by creating reef habitat. However, the overall footprint compared to the wider Waterway will be negligible, and the duration of deployment is short to medium term.
3	Underwater noise	Operation and maintenance of the marine renewable devices will result in noise levels lower than ambient noise levels experience within the fish and shellfish study area.
4	Medium-term habitat loss	The marine renewable device's footprint in the wider context of the fish and shellfish study area is predicted to be negligible, therefore having little impact on sensitive receptors.
5	EMF	EMF emitted by communications cables and marine renewable devices during the operational phase is expected to have negligible impact to

Impact No.	Impact	Justification
		receptors. The cables primary use is as a communication line to the device and as such a small voltage cable will be used.

Potential Cumulative Impacts

The potential for the following projects or activities will be considered within the Fish and Shellfish EIA Study Area (the maximum adverse scenarios for each of the projects will be assessed) for each META site supporting Phase 2 activities:

- Other META Project sites;
- Offshore wind farms and associated cabling and infrastructure;
- Cables and pipelines;
- The Pembroke Dock Marine project; and
- Other forms of cabling.

Beach replenishment schemes:

- Other forms of cabling (i.e. telecommunications and interlinks);
- Commercial fishing activity;
- Navigation and shipping;
- The Pembroke Dock Marine development;
- Aggregate extraction and disposal of dredging spoil; and
- Redevelopment of the Milford Haven area.

The CIA will consider the same impacts across all phases of the Project, as outlined in Table 6-7.

6.4 Marine Mammals

6.4.1 Introduction

This Chapter will identify the marine mammal species which are of relevance to the Study Area. It will provide an assessment of the potential impacts of the proposed development during the installation, operation and decommissioning phases of the META Project on marine mammals. Basking shark will also be scoped for potential impact in this Chapter. Effects on marine mammal and basking shark receptors will be assessed in this technical Chapter, with the exception of those receptors in an onshore environment (i.e. Eurasian otter in an onshore environment) which will be assessed in the Onshore Ecology Chapter (Chapter 6.6).

6.4.2 Study Area

The Study Area includes Milford Haven and a 100 km radius from the centre of the Waterway (Figure 6-9). This Study Area is proportional to the scale and inshore location of the development and captures all relevant designated sites. JNCC Cetacean Management Units will be considered as part of the EIA.

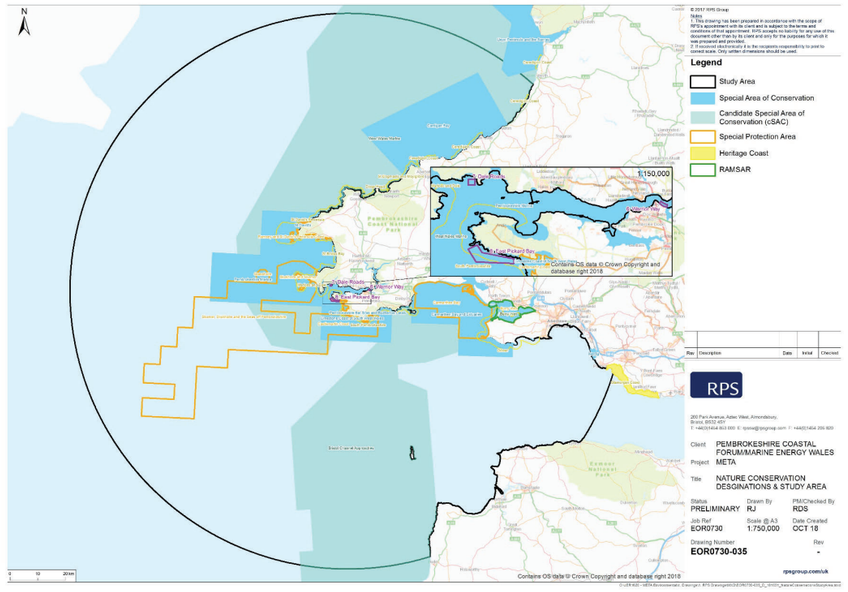

Figure 6-9: Marine Mammal Study Area showing a 100 km radius from the centre of MHW and relevant designated sites

6.4.3 Baseline Information

An initial desk-based review of literature and data sources to inform this Scoping Report has highlighted the following sources which provide marine mammal data coverage of the marine mammal Study Area:

- Atlas of the Marine Mammals of Wales (Baines and Evans, 2012);
- Marine Renewable Energy Strategic Framework for Wales (MRESF) - Studies of Marine Mammals in Welsh High Tidal Waters 2011, acoustic and visual survey (Gordon *et. al.,* 2011);
- The JNCC Cetaceans Atlas (Reid *et al.*, 2003);
- Small Cetaceans in the North Sea (SCANS) surveys (SCANS I, II and III) (Hammond *et al.*, 2002; 2006; 2017); and
- RPS Shore-based Observational Marine Mammal Survey 2006 (Shepherd and Rowson, 2006).

Milford Haven is a well-studied area, and as such, it is expected that no further surveys will be required.

The following species are most likely to be encountered in the Study Area and will be the focus of assessment. The most commonly occurring marine mammal species in this region (Baines and Evans 2012) are:

- Harbour porpoise (*Phocoena phocoena*);
- Bottlenose dolphin (*Tursiops truncatus)*;
- Short-beaked common dolphin *(Delphinus delphis)*;
- Risso's dolphin *(Grampus griseus)*;
- Minke whale *(Balaenotpera acutorostrata);* and
- Grey seal *(Halichoerus grypus*).

Recent surveys in the Study Area, such as the *RPS Shore-based Observational Marine Mammal Survey 2006* (Shepherd and Rowson, 2006), the RPS *Studies of Marine Mammals in Welsh High Tidal Waters 2011* (Gordon *et. al.,* 2011) and the Scans III aerial and shipboard surveys of 2016, show that the most frequently recorded cetaceans in Milford Haven are harbour porpoise and bottlenose dolphin (Shepherd and Rowson, 2006) and the most frequently recorded cetaceans in the Study Area as a whole are harbour porpoise, bottlenose dolphin and short-beaked common dolphin (Hammond *et al.*, 2016). The Atlas of Marine Mammals in Wales report (a database of recorded marine mammals in Wales since 1990) also detected presence of short-beaked common dolphin (1,502 sightings) in Welsh waters, but at a lower abundance than harbour porpoise (13,056 sightings) and bottlenose dolphin (10,236 sightings) (Baines and Evans 2012). Other species such as minke whale (211 sightings) and Risso's dolphin (616 sightings) have also been recorded in the Study Area are but generally less frequently and are more commonly recorded further offshore (Reid *et al.*, 2003; Hammond *et al.,* 2016). Atlantic white-sided dolphin (four sightings) and killer whale (six sightings) were recorded during the surveys, however sightings of these species close to the shore are rare (Reid *et al.*, 2003; Hammond *et al.*, 2016).

It is considered that the seal population in Wales consists almost entirely of grey seal (Baines and Evans, 2012; Russell *et al.* 2017). Harbour seal (*Phoca vitulina)* rarely visit the southern Irish or northern Celtic Seas (Russel *et al.* 2017), although there is some anecdotal data of individual animals that have remained around the Menai straits or on Ynys Enlli for some months at a time (Lerwill *et al.,* 2003). Grey seals have been sighted within the Study Area (Gordon *et. al.,* 2011).

The Eurasian otter has a wide range and distribution throughout the Study Area (NTW, 2018; Strachan, 2015), based on spraint records on foreshores, and foreshore access points from watercourses with suitable breeding and feeding habitat (Strachan, 2015). A survey of otter activity

and habitat availability around the Pembrokeshire Coast and the Waterway (Liles, 2009) found signs of otters (spraints and tracks) at a number of survey sites.

There have been a number of recent studies to determine basking shark distribution and status in UK waters, including tagging studies which track basking shark movements in the north-east Atlantic (Sims *et al.,* 2003, Sims *et al.*, 2005, Solandt, 2007, Southall *et al.*, 2005, Doherty *et al.,* 2017). The Marine Conservation Society has collated sightings data sent to the charity between 1987 and 2006 which suggests that the highest densities of basking sharks in UK waters are the west coast of Scotland, the Isle of Man and the southwest of England (Bloomfield and Solandt, 2006), corroborated by long-term satellite tagging of basking sharks between 2012 and 2015 (Doherty *et al.,* 2017) and satellite-tagging studies of basking sharks between 2001 and 2002 (Miller *et al.,* 2015). Doherty *et al* 2017 found that waters of importance for basking sharks included the Celtic and Irish Seas, showing Pembrokeshire coastline within the 51-75 percentile for relative importance to tracked basking sharks within the derived study location (Doherty *et al.,* 2017).

6.4.4 Designated Sites

Several internationally and nationally designated areas with marine mammals as a notified interest feature occur within the Study Area. An overview of designated sites may be seen in Figure 6-9 and a more detailed view of Milford Haven Waterway SSSI can be seen in Figure 6-10. A summary of the designated sites and their relevant qualifying interest features is presented in Table 6-9.

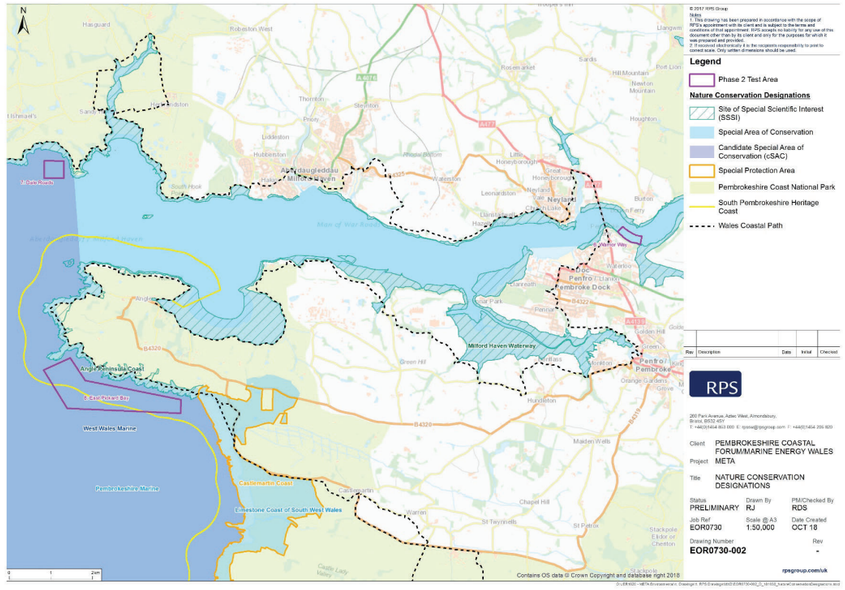

Figure 6-10: Nature Conservation Designations in Milford Haven Waterway

The key sites of relevance to the assessment will be:

- Pembrokeshire Marine/Sir Benfro Forol SAC;
- The West Wales Marine/Gorllewin Cymru Forol cSAC;
- Cleddau Rivers/Afonydd Cleddau SAC;
- Cardigan Bay/Bae Ceredigion SAC;
- Bristol Channel Approaches/Dynesfeydd Môr Hafren cSAC;
- Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC; and
- Milford Haven Waterway SSSI.

Table 6-9 shows designated sites and their relevant marine mammal qualifying interest features.

Table 6-9: Designated Sites and Relevant Qualifying Features for Marine Mammals

Designated Site	Closest Distance to META sites (km)			Relevant Qualifying Interest Feature
	Warrior Way	Dale Roads	East Pickard Bay	
Pembrokeshire Marine/ Sir Benfro Forol SAC	0	0	0	Annex II Species • Grey Seal (*Halichoerus grypus*) • Otter (*Lutra lutra*)
West Wales Marine / Gorllewin Cymru Forol cSAC	13	0	0	Annex II Species • Harbour porpoise (*Phocoena phocoena)*
Cleddau Rivers/ Afonydd Cleddau SAC	11	16	17	Annex II Species • Eurasian Otter (*Lutra lutra*)
Milford Haven Waterway SSSI	0	< 0.1	2.2	• Eurasian Otter (*Lutra lutra*)
Bristol Channel Approaches cSAC/ Dynesfeydd Môr Hafren MPA	19	7	15	Annex II Species • Harbour porpoise (*Phocoena phocoena)*
Lleyn Peninsula and the Sarnau/ Pen Llyn a`r Sarnau SAC	91	98	102	Annex II Species • Bottlenose dolphin; • Grey seal (*Halichoerus grypus*) • Euraisan otter (*Lutra lutra*) (scoped out due to distance from development)

6.4.5 Proposed Approach to EIA

The EIA will consider the potential effects of the installation, operational and decommissioning phases of the META Project, on marine mammal receptor species identified as being recorded

above 'rare' within the marine mammal Study Area. The assessment will be undertaken for identified species (as set out above) against a relevant reference population for that species. This will be the species specific Marine Mammal Management Units (MMMU) '*Management Unit for Cetaceans in UK waters'* (IAMMWG, 2015) and Seals (IAMMWG, 2013). The assessment method to be used will draw on the most recent Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment in the UK and Ireland (2018), and the magnitude of potential impact will be assessed against the species population, density and MMMU area associated with each species MMMU. In addition, the EIA approach will take note of the legislative requirements of the Offshore Marine Conservation of Habitats and Species Regulations 2017 (Offshore Habitats Regulations), the Conservation of Habitats and Species Regulations 2017 (Habitats Regulations, the WCA1981 (as amended) and the MCAA 2009 (as amended).

The impacts to be considered in the EIA are outlined below in Table 6-10, although these would be expected to be localised and short lived during the installation and decommissioning phases and highly localised during the operational phase of the Project. These impacts will be assessed using desk-based information and will draw upon existing evidence and available data.

The impact assessment will consider both direct impacts of the development on marine mammals (e.g. potential impacts/disturbance to marine mammals due to installation activities and/or operation of devices) and indirect impacts (e.g. potential effects on water quality due to increases in suspended sediment concentrations (SSCs), potential reduction in marine mammal prey availability). The potential impact on marine mammal receptors that will be assessed is presented below in Table 6-10.

Valued Ecological Receptors

For the purposes of conducting the EIA, a summary of the marine mammal VERs and their value within the marine mammal Study Area will be provided. The valuation is based on their legislative status together with the relative importance of the populations present within the Study Area compared to the wider regional marine mammal Study Area, and UK as a whole. The overall value of each VER will be assessed using the criteria presented in Table 6-10.

Assessment of Effects

A range of potential impacts on marine mammals have been identified which may occur during the installation, operation and decommissioning phases of the Project (see Table 6-10).

Table 6-10: Impacts to be assessed in the Marine Mammal EIA

Impact No	Potential Impact	Justification	Proposed Approach to EIA
Installation and Decommissioning Phase			
1	Increased Anthropogenic Underwater Noise - Vessel noise	Increased vessel traffic during installation may result in an increase in disturbance to marine mammals	Reference will be made to the Navigation and Shipping Chapter (Chapter 6.7) to understand the baseline levels of vessel traffic in the study area to estimate the potential increase arising from vessel activity during installation. The types of vessels to be utilised during installation will be considered and an evaluation of the potential for noise disturbance, based on a literature review of all relevant data will be undertaken.
2	Increased collisions risk with vessels	Increased vessel traffic during installation may result in an increased collision risk with marine mammals	Reference will be made to the Navigation and Shipping Chapter (Chapter 6.7) to understand the baseline levels of vessel traffic in the study area to estimate the potential uplift arising from vessel activity during installation. The types of vessels to be utilised during installation will be considered and an assessment will be undertaken based on a literature review of relevant available evidence.
3	Increases in suspended sediment concentration (SSC)	There is the potential that increased SSC arising from installation activities such as cable installation, may impair the foraging ability of marine mammals	To be informed by the Coastal Processes Assessment in Chapter 6.1. Available data will inform a robust baseline characterisation of the Phase 2 Sites and wider Study Area. The EIA will investigate the potential for changes to coastal processes, particularly to local tidal and wave conditions.
4	Changes in fish and shellfish community	Changes in the fish and shellfish community resulting from installation impacts may lead to a potential decrease in prey availability to marine mammals.	To be informed by the approach to Fish and Shellfish Assessment in Chapter 6.3. The impact assessment will consider both direct and indirect potential impacts and the impacts will be assessed based on an understanding of the local fish density and community structure and the nature of the proposed activities
Operation and Maintenance Phase			
5	Collision risk – tidal turbines	There is a risk of collision with operational tidal turbines	Assessment based on a literature review of available evidence and assessment of swept area of operation tidal turbines in relation to channel available, will be undertaken.
6	Entanglement Risk	The presence of slack lines and/or chains attached to floating devices could result in entanglement of animals	Assessment based on a literature review of available evidence will be undertaken.
7	Increased anthropogenic noise - vessels	Increased vessel traffic during the Operation and Maintenance phase may result in an increase in disturbance to marine mammals	See summary of approach for Impact 1 of this table.
8	Vessel collisions risk	Increased vessel traffic during the operational phase may result in an	See summary of approach for Impact 2 of this table.

Impact No	Potential Impact	Justification	Proposed Approach to EIA
		increased collision risk to marine mammals	
9	Increases in suspended sediment concentration (SSC)	There is the potential that increased suspended sediments, arising from operational activities may impair the foraging ability of marine mammals	See summary of approach to Marine Mammal Assessment under Impact 3 of this table.
10	Changes in fish and shellfish community	Changes in the fish and shellfish community resulting from impacts during the operational phase could lead to a loss in prey resources for marine mammals	See summary of approach to Impact 4 of this table.

Knowledge of the baseline environment and the proposed activities have allowed impacts to be scoped out of the assessment, where there is considered to be no receptor-impact pathway (Table 6-11)

Table 6-11: Impacts proposed to be Scoped out of Marine Mammal EIA

Impact to be Scoped Out	Justification
Increased Underwater Noise – installation and decommissioning activities	The noise produced by installation and decommissioning activities could result in potential effects on marine mammals, however based on the expected sound source pressure of drilled piling (sound pressure levels lower than expected from miscellaneous small vessels) is unlikely to result in injury to marine mammals (Kongsberg, 2012) (see Table 6-12 for noise level clarifications).
Electro-magnetic Field (EMF) during operational phase	EMF emitted by array and export cables may potentially affect marine mammal behaviour, however initial assessment shows that this impact will be negligible due to low voltage travelling through communications cable, and as such will be scoped out.
Increased anthropogenic noise –tidal turbines during operational phase	The operating noise of turbines could result in potential effects on marine mammals, however based on available data suggesting low noise levels produced during operation of tidal turbines, and relatively high levels of baseline noise present within the Waterway, this impact has been scoped out.
Eurasian otter at Pen Llyn a`r Sarnau / Lleyn Peninsula and the Sarnau SAC at all phases	Although otter is a relevant qualifying interest feature of this SAC, given the distance of the SAC from the Project (≥ 91 km), it is highly unlikely that otters would be impacted.
Accidental Pollution - all phases	The potential for accidental pollution will be managed by the EMMP, therefore the likelihood of an accidental spill occurring is

Impact to be Scoped Out	Justification
	highly unlikely. As such the effects on marine mammals are proposed to be scoped out of the EIA

Table 6-12 illustrates the noise levels for various offshore marine works.

Table 6-12: Sound noise levels for offshore operations

Item	Description/ assumptions	Data source	Source sound pressure level at 1 m		
			RMS, dB re 1 µPa	***Peak, dB re 1 µPa***	***SEL(24h), dB re 1 µPa²s***
Anchor handling vessel	Tug used as proxy	Richardson (1995)	172	175	221
Installation / construction vessel (using DP)	'Gerardus Mercator' trailer hopper suction dredger using DP as proxy	Wyatt (2008)	188	191	237
Support vessel	Based on measurements on offshore support vessel	(McCauley 1998)	179	182	228
Rock placement vessel	'Gerardus Mercator' trailer hopper suction dredger using DP as proxy	Wyatt (2008)	188	191	237
Cable lay vessel	'Gerardus Mercator' trailer hopper suction dredger using DP as proxy	Wyatt (2008)	188	191	237
Misc. small vessels (e.g. tugs, vessels carrying ROVs, crew transfer vessels, dive boats and RIBs)	Tug used as proxy	Richardson (1995)	172	175	221
Pile drilling	Pile drilling for Oyster 800 project	Kongsberg (2011)	163	166	212
Cable trenching / cutting	Based on measurements made at North Hoyle during trenching	J. Nedwell, Langworthy and Howell 2003	178	181	227
Jack up barge	Drilling rig used as proxy	Hannay et al. 2004 - 1/3 octaves	162	165	211

Item	Description/ assumptions	Data source	Source sound pressure level at 1 m		
			RMS, dB re 1 µPa	***Peak, dB re 1 µPa***	***SEL(24h), dB re 1 µPa²s***
		measured for drilling rig (Wyatt 2008)			

Potential Cumulative Impacts

The potential for the following projects or activities will be considered within the marine mammal EIA Study Area (the maximum adverse scenarios for each of the projects will be assessed) for each META site supporting Phase 2 activities:

- Other META sites supporting Phase 2 activities;
- Offshore wind farms and associated cabling and infrastructure;
- Pembroke Dock Marine;
- Oil and gas infrastructure/development; and
- Aggregate extraction and disposal of dredging spoil.

The CEA will consider the same impacts across all phases of the project, as outlined in Table 6-10.

6.5 Marine Ornithology

6.5.1 Introduction

This Chapter will identify bird populations in the offshore environment which are of relevance to the Study Area. It will provide an assessment of the proposed development during the installation, operation and decommissioning phases of the META Project on seabirds. Potential impacts on ornithological receptors in an onshore environment are considered in Chapter 6.6, Onshore Ecology.

6.5.2 Study Area

The Study Area includes a 580 km radius from the centre of the MHW (Figure 6-11). This Study Area is defined by the mean-maximum foraging distances of bird species likely to be found at the META project sites and listed as features of designated sites. The outer limit of the study area is defined by that of the largest mean-maximum foraging range (Thaxter *et al.,* 2012; Soanes *et. al.,* 2018), of the northern fulmar, *Fulmaris glacialis*, which is known to forage up to 580 km from its colony (Thaxter *et al.,* 2012). As such, this Study Area encompasses the foraging ranges of all relevant species.

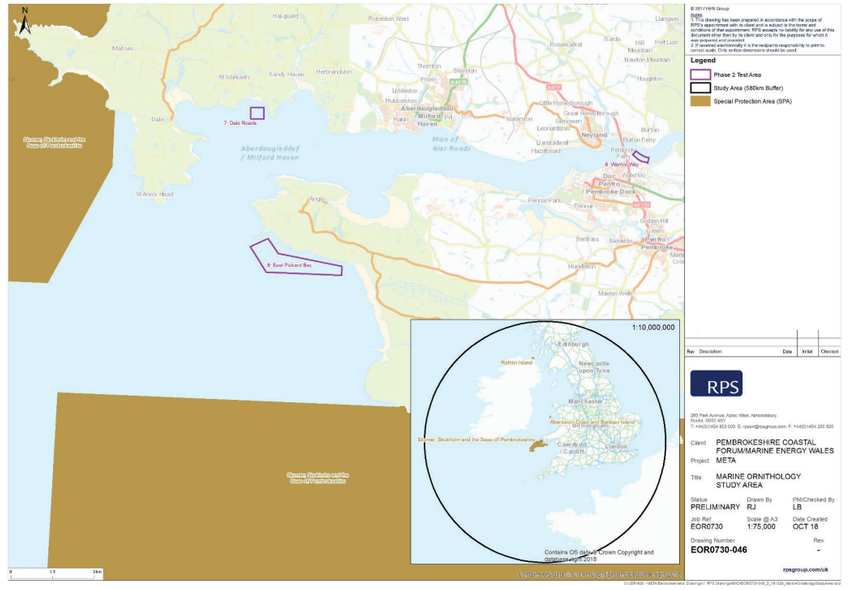

Figure 6-11: Marine Ornithology Study Area

6.5.3 Baseline Information

Baseline Studies

An initial desk-based review of literature and data sources to inform this Scoping Report has highlighted the following sources which provide marine ornithology data coverage of the Study Area:

- JNCC Seabird 2000 report;
- Skomer Island Wildlife Report 2016;
- Seabird numbers and breeding success in Britain and Ireland, 2006; and
- JNCC Report 2010 - An analysis of the numbers and distribution of seabirds within the British Fishery Limit aimed at identifying areas that qualify as possible marine SPAs (Kober *et al.*, 2010).

This will be supported by additional guidance documents, peer-reviewed papers and relevant data sources such as historic Marine Licences from the Study Area.

The following discussion focuses on the species that are most likely to be encountered in the Study Area. The most commonly occurring seabird species in this region are:

- Manx shearwater (*Puffinus puffinus);*
- Common guillemot (*Uria aalge*);
- Northern fulmar (*Fulmarus glacialis*);
- Razorbill (*Alca torda*);
- Greater black backed gulls (*Larus marinus*);
- Lesser black backed gulls (*Larus fuscus);*
- Atlantic puffins (*Fratercula arctica)*; and
- European storm petrel (*Hydrobates pelagicus*).

JNCC's Seabird 2000 report, Seabird numbers and Breeding Success in Britain and Ireland Report (Mavor, 2008), and the 2016 Skomer Island Wildlife Report (Moss *et al.*, 2016) identified large populations of Manx shearwater (145,000 individuals) and lesser black backed gulls (12,000 individuals) in the vicinity of the Study Area (Mitchell *et al.*, 2004). Atlantic puffin, European storm petrel and herring gull were also found to be present but in lower abundance. Rare species have also been recorded on nearby Skomer island e.g. great egret (*Ardea alba*), Sabine's gull (*Xema sabini*), black-headed bunting (*Emberiza melanocephala*) and the common nightingale (*Luscinia megarhynchos*) (The Wildlife Trust of South and West Wales, 2016).

6.5.4 Designated Sites

Several internationally and nationally designated areas with bird populations as a notified interest feature occur in the vicinity of the Study Area. A summary of their qualifying interest features is presented in Table 6-13.

The key sites of relevance to the assessment will be:

- Skomer, Skokholm and the Seas off Pembrokeshire/ Sgomer, Sgogwm a Moroedd Penfro SPA;
- Aberdaron Coast and Bardsey Island/ Glannau Aberdaron ac Ynys Enlli SPA; and
- Rathlin Island SPA.

Table 6-13: Designated Sites and Relevant Qualifying Features for Marine Ornithology

	Closest Distance to META sites (km)			
Designated Site	**Warrior Way**	**Dale Roads**	**East Pickard Bay**	**Relevant Notified Interest Feature** (those features shaded in grey will not be considered due to lack of receptor-impact pathway)
Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro SPA	6.5	4.5	8	Annex II Species Short-eared owl (*Asio flammeus*) Atlantic puffin *(Fratercula arctica)* European storm petrel (*Hydrobates pelagicus)* Lesser black-backed gull (*Larus fuscus*) Manx shearwater (*Puffinus puffinus* Red-billed chough (*Pyrrhocorax pyrrhocorax*) Other Important Species Razorbill (*Alca torda*) Common guillemot (*Uria aalge*) Black-legged kittiwake (*Rissa tridactyla*)
Aberdaron Coast and Bardsey Island / Glannau Aberdaron ac Ynys Enlli SPA	107	107	113	Annex II Species Manx shearwater (*Puffinus puffinus*)
Rathlin Island SPA	403	400	406	Annex II Species Razorbill (*Alca torda*) *Peregrine falcon (Falco peregrinus*) Black-legged kittiwake (*Rissa tridactyla*) Common guillemot (*Uria aalge)* Other Important Species Northern fulmar (*Fulmarus glacialis*)

6.5.5 Proposed Approach to EIA

The EIA will consider the potential effects of the installation, operational and decommissioning phases of the Project, on seabirds identified as being features of conservational interest in the

marine ornithology Study Area. The impacts to be considered in the EIA are outlined below, although these would be expected to be localised and short lived during the installation and decommissioning phases and highly localised during the operational phase of the META Project.

These impacts will be assessed using desk-based information and will draw upon existing evidence and data available from other developments in the area and historic marine licence applications within the Waterway.

The impact assessment will consider both direct impacts of the development on seabirds (e.g. potential impacts/disturbance due to installation activities and/or operation of structures) and indirect impacts (e.g. potential reduction in seabird prey availability) with a list of the potential impacts on receptors presented below in Table 6-14.

Valued Ecological Receptors

For the purposes of conducting the EIA, a summary of the marine ornithology VERs and their value within the marine ornithology Study Area will be provided. The valuation will be based on their legislative status together with the relative importance of the populations present within the Study Area compared to the wider regional marine ornithology Study Area, and UK as a whole. The overall value of each VER will be assessed using the criteria presented in Table 4-1.

Assessment of Effects

A range of potential impacts on seabirds have been identified which may occur during the installation, operation and decommissioning phases of the META Project. These are set out in Table 6-14.

Table 6-14: Impacts to be assessed in the Marine Ornithology EIA

Impact No	Impact	Justification	Proposed Approach to EIA
Installation and Decommissioning Phases			
1	Changes in fish and shellfish community	Changes in the fish and shellfish community resulting from increased vessel use or installation and decommissioning activities, may lead to a potential decrease in seabird prey availability	Reference will be made to the Fish and Shellfish Ecology Chapter (Chapter 6.3) to understand the baseline populations of fish and shellfish in the Study Area and to estimate the potential change due to installation or decommissioning activities. An assessment will be undertaken based on a literature review of available data
2	Increased anthropogenic noise - vessels	Increased vessel traffic during the operational phase may result in an increase in disturbance to seabirds	Reference will be made to the Navigation and Shipping Chapter (Chapter 6.7) to understand the baseline levels of vessel traffic in the Study Area and to estimate the potential increase in disturbance arising from vessel activity during operation. The types of vessels to be utilised during installation will be considered and an evaluation of the potential for noise disturbance, based on a literature review of all available data will be undertaken
Operational Phase			
3	Collision risk – tidal turbines	The presence of operating tidal turbines at Warrior Way may result in potential effects on seabirds	A desktop review of available literature will be undertaken to understand potential for tidal turbines to create a collision risk for seabirds in the Study Area.
4	Increased anthropogenic noise - vessels	Increased vessel traffic during the operational phase may result in an increase in disturbance to seabirds	Reference will be made to the Navigation and Shipping Chapter (Chapter 6.7) to understand the baseline levels of vessel traffic in the Study Area and to estimate the potential increase in disturbance arising from vessel activity during operation. The types of vessels to be utilised during installation will be considered and an evaluation of the potential for noise disturbance, based on a literature review of all available data will be undertaken
5	Changes in fish and shellfish community	Changes in the fish and shellfish community resulting from impacts during the operational phase could lead to a loss in prey resources for seabirds	Reference will be made to the Fish and Shellfish Ecology Chapter (Chapter 6.3) to understand the baseline populations of fish and shellfish in the Study Area and to estimate the potential change due to vessel activity and operations as part of the maintenance phase. An assessment will be undertaken based on a literature review of available data

Knowledge of the baseline environment and the proposed activities have allowed impacts to be scoped out of the assessment where there is considered to be no receptor-impact pathway. These are outlined in Table 6-15.

Table 6-15 Impacts Proposed to be Scoped out of Marine Ornithology EIA

Impact to be Scoped Out	Justification
Increased collisions risk with vessels at all phases	This is not currently deemed to be an issue for birds within the Study Area, therefore this is not considered an impact requiring assessment with the small increase of vessel traffic dur to the META project
Accidental Pollution at all phases	The potential for accidental pollution will be managed by the EMMP, therefore the likelihood of an accidental spill occurring is highly unlikely. As such the effects on benthic ecology are proposed to be scoped out of the EIA

Potential Cumulative Impacts

The potential for the following projects or activities will be considered within the marine ornithology EIA Study Area (the maximum adverse scenarios for each of the projects will be assessed) for each META Project site:

- Offshore wind farms and associated cabling and infrastructure;

- Oil and gas infrastructure/development; and
- Aggregate extraction and disposal of dredging spoil.

The CIA will consider the same impacts across all phases of the project as outlined in the Assessment of Effects Section above.

6.6 Onshore Ecology

6.6.1 Introduction

This Section of the Scoping Report identifies the Onshore Ecology receptors of relevance to the META Project EIA, and considers the potential impacts from the installation, Operation and Maintenance, and decommissioning of the META Project on receptors occurring above MHWS.

6.6.2 Study Area

The Study Area for the Onshore Ecology EIA is, at this stage, defined as land within the onshore communications corridor (OCC) search area landward of MHWS and the proposed locations for the temporary onshore control station, plus a buffer of 10 km (Figure 6-12).

Upon finalisation of the OCC route, the Onshore Ecology Study Area will be refined to include the temporary land take for the onshore works.

6.6.3 Baseline Information

Baseline Studies

Data sources to be reviewed as part of the baseline characterisation of the onshore works include:

- Citations and further details of SACs, SPAs, Ramsar Sites, SSSIs, NNRs and Ancient Woodland areas;
- Details of County Wildlife Sites (CWS), Sites of Nature Conservation Importance, Local Wildlife Sites and BAP Habitats provided by JNCC, NRW and PCC;
- Grey, primary and review literature; and
- Extended Phase 1 ecological survey report (RPS, 2018).

In addition to the above data sources, an over-wintering bird survey focussing on red-billed chough is currently being undertaken, and relevant outputs will be included in the baseline characterisation.

An initial review of published OS maps and reports shows that land use within the Study Area is predominantly intertidal coastland and beach with cliffs to the north. To the east beyond the beach is a mosaic of dunes, improved and semi-improved grassland, and arable farmland.

6.6.4 Designated Sites

Nature conservation designated sites within 10 km of the Study Area comprise a number of international, European designations, national designations. A consultation exercise will be undertaken to request any recent records of protected species within 1 km of the Study Area. Further details on these designated sites are provided in Table 6-16 below.

Table 6-16: International and National Designated Sites within 10 km of the Study Area

Site	Nearest distance from Study Area (km)	Relevant Notified Interest Features ((those features shaded in grey will not be considered due to lack of receptor-impact pathway))
Limestone Coast of South West Wales / Arfordir Calchfaen De Orllewin Cymru SAC	0.00	• Vegetated sea cliffs of the Atlantic and Baltic coasts • Fixed coastal dunes with herbaceous vegetation "grey dunes" • European dry heaths • Semi-natural dry grasslands and scrubland facies on calcareous substrates • Caves not open to the public • Submerged or Partially submerged caves • Greater horseshoe bat (Rhinolophus *ferrumequinum)* • Early gentian **(***Gentianella anglica)* • *Petalwort* **(***Petalophyllum ralfsii)*
Pembrokeshire Bat Sites and Bosherton Lakes / Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton SAC	8.28	• Greater horse-shoe bat (*Rhinolophus ferrumequinum)*
Pembrokeshire Marine / Sir Benfro Forol SAC	0.00	• Shore Dock (*Rumex rupestris*) • Otter (*Lutra lutra*)
Castlemartin Coast SPA	0.00	• Chough (Pyrrhocorax pyrrhocorax)
Arfordir Penrhyn Angle / Angle Peninsula Coast SSSI	0.33	• Intertidal rock, sand and gravel communities. • Chough • Geological exposures - Quaternary of Wales, • Geological exposures - Devonian (non-marine)
Broomhill Burrows SSSI	0.00	• Mobile Dune, Dune Grassland and Dune Slack vegetation • Rare Sand Dune Plants • Chough • Cliff Structures
Castlemartin Corse SSSI	0.32	• Swamp • Fen Meadow • Fen Pondweed (*Potamogeton coloratus*)

Site	Nearest distance from Study Area (km)	Relevant Notified Interest Features ((those features shaded in grey will not be considered due to lack of receptor-impact pathway))
Castlemartin Range SSSI	0.00	• Intertidal and terrestrial cliff-crevice communities • Greater horseshoe bat • Lesser horseshoe bat (*Rhinolophus hipposideros*) • Guillemots • Choughs • Peregrine (*Falco peregrinus*) • Maritime grassland • Heath • Neutral grasslands • Calcareous grassland • Sand dune habitats
Milford Haven Waterway SSSI	1.24	• Shelduck (*Tadorna* spp.) • Wigeon (*Mareca* spp.) • Teal (*Anas crecca*) • Curlew (*Numenius* spp.) • Dunlin (*Calidris alpine)* • Little grebe (*Tachybaptus ruficollis*) • Otter • Greater horseshoe bats • Lesser horseshoe bats • Geology: Non-marine Devonian - Little Castle Head

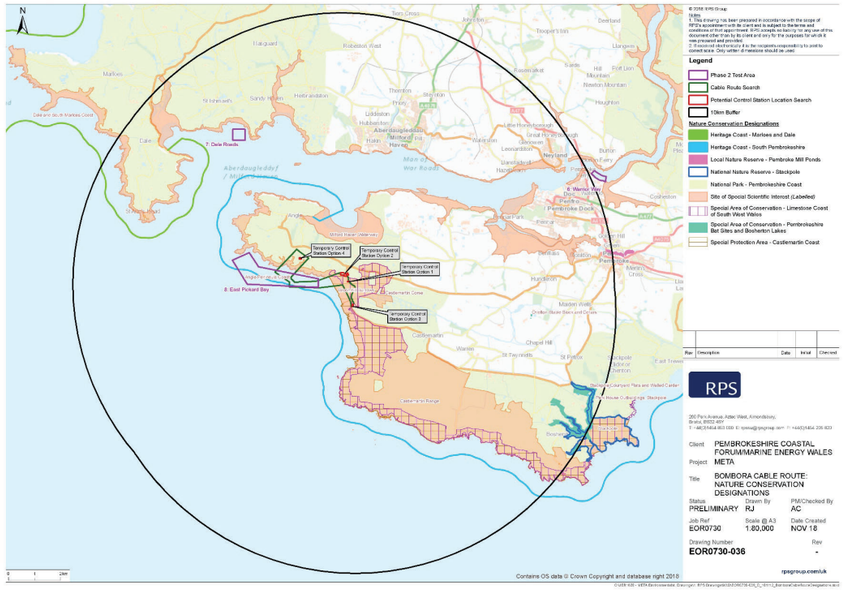

Figure 6-12: Conservation Designations within 10 km of the Onshore Ecology Study Area

6.6.5 Proposed Approach to EIA

The ecology and nature conservation assessment process will be undertaken in accordance with the Guidelines for Ecological Impact Assessment (EcIA) in the UK and Ireland – Terrestrial, Freshwater and Coastal (CIEEM, 2018).

Baseline Studies

An initial desk-based review of literature and data sources to inform this Scoping Report has highlighted the following sources which provide onshore ecological data coverage of the Study Area:

- West Wales Biodiversity Information Centre;
- The Wildlife Trust of South and West Wales;
- South and West Wales Amphibian and Reptile Group;
- Pembrokeshire Bat Group;
- Pembrokeshire Royal Society for the Protection of Birds (RSPB); and
- Pembrokeshire County Recorder (Jon Green).

This will be supported by additional guidance documents, peer-reviewed papers and relevant data sources such as historic Town and Country Planning (T&CP) applications within the Study Area.

Valued Ecological Receptors

For the purposes of conducting the EIA, a summary of the Onshore Ecology VERs and their value within the Onshore Ecology Study Area will be provided. The valuation will be based on their legislative status together with the relative importance of the receptor present within the Study Area compared to a regional Study Area and the UK as a whole. The overall value of each VER will be assessed using the criteria presented in Table 4-1.

Assessment of Effects

A range of potential impacts on Onshore Ecology have been identified which may occur during the installation, Operation and Maintenance, and decommissioning phases of the META Project. The impacts that have been scoped into the assessment are outlined in Table 6-17, together with a description of any additional data collection (e.g. site-specific surveys) and/or supporting analyses that will be required to enable a full assessment of the impacts.

Table 6-17: Impacts to be assessed in the Onshore Ecology EIA

Impact no.	Impact	Justification	Proposed approach
Installation and Decommissioning Phases			
1	Disturbance or damage to habitats/species	Protected or important habitats/species could be damaged or disturbed as the result of an increase in noise, vibration, light and other activities associated with onshore works	An extended Phase 1 survey of the cable corridor search area, and over-wintering bird survey within the dune habitat and cliff/cliff top areas, along with a review of available data will be used to assess potential impact

Impact no.	Impact	Justification	Proposed approach
2	Habitat fragmentation and severance	Cable trenching could result in the fragmentation or severance of habitats	As above impact no. 1
3	Temporary displacement of species	Temporary installation activities and temporary land take may result in temporary displacement of species	As above impact no. 1
4	Habitat loss and disturbance/ displacement of species	The temporary land take required for the installation of the onshore control station may result in the temporary loss of habitats	As above impact no. 1
Operation and Maintenance			
5	Disturbance to species	Disturbance of species as a result of noise and light	As above impact no. 1

Knowledge of the baseline environment and the proposed activities have allowed impacts to be scoped out of the assessment where there is considered to be no receptor-impact pathway. These are outlined in Table 6-18.

Table 6-18: Impacts proposed to be scoped out of the Onshore Ecology EIA

Impact No.	Impact	Justification
1	Disturbance to species as a result of release of pollutants	All accidental risk of pollutants will be managed through a EMMP
Operation and Maintenance		
2	Disturbance to species as a result of release of pollutants	All accidental risk of pollutants will be managed through a EMMP

Potential Cumulative Impacts

The potential for the following projects or activities will be considered within the onshore ecology EIA Study Area (the maximum adverse scenarios for each of the projects will be assessed) for each META site supporting Phase 2 activities:

The following projects will be considered within the Onshore Ecology Study Area:

- Other META sites supporting Phase 2 Activities;
- Other onshore cabling and infrastructure;
- Onshore energy generation projects; and
- Minerals extraction and aggregate projects.

The CIA will consider the same impacts across all phases of the project as outlined in the Assessment of Effects Section above.

6.7 Underwater Noise

6.7.1 Introduction

The underwater noise assessment will be compiled to inform topic specific EIAs, in particular Marine Mammals (Chapter 6.4) and Fish and Shellfish (Chapter 6.3).

6.7.2 Study Area

The Underwater Noise Study Area will be specific to and informed by the Study Areas defined in relevant topic specific EIAs - Marine Mammals (Chapter 6.4) and Fish and Shellfish (Chapter 6.3), with particular focus on the Warrior Way (Site 6), Dale Roads (Site 7) and East Pickard Bay (Site 8).

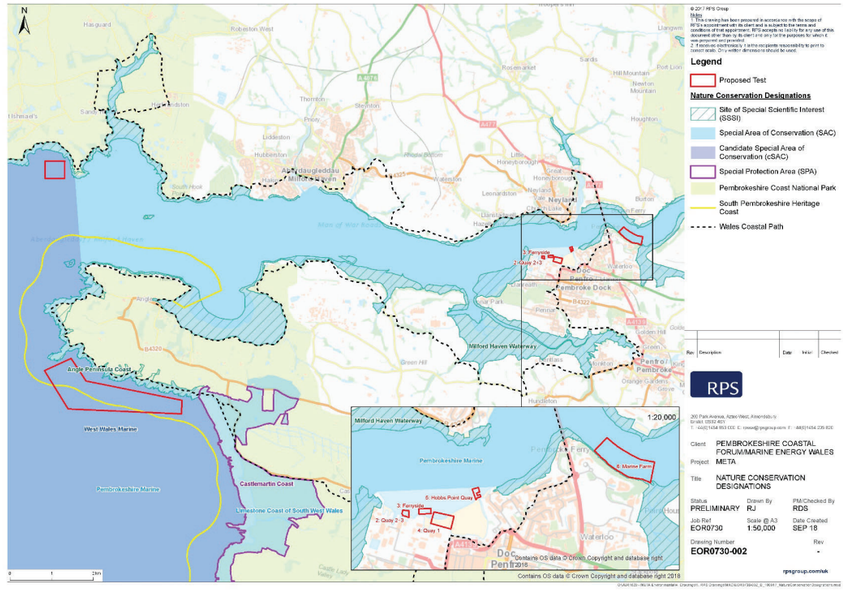

Figure 6-13: Nature Conservation Designations in Milford Haven Waterway

6.7.3 Baseline Information

Underwater noise as a result of installation activities (e.g. pin piling) may result in effects on receptors such as marine mammals, fish and shellfish within the Study Areas.

The marine environment at Warrior Way, given its proximity to Pembroke Docks is regularly exposed to elevated noise levels (e.g. from vessel movement or dredging), and the enclosed nature of the dock means that the resident species cannot entirely avoid these noise levels. It is therefore reasonable to assume that the resident fish population at this site would have some tolerance to underwater noise.

The marine environment at Dale Roads is less exposed to elevated noise levels than Warrior Way, due to distance from Pembroke Docks, but is expected to experience elevated noise levels from vessel movement within the Waterway.

The marine environment at East Pickard Bay is less exposed to elevated noise levels than Warrior Way and Dale Roads and is expected to experience low noise levels from vessel movement, given its location outside of the Waterway.

Vessel movement during installation and decommissioning phases within the Study Areas is expected to increase and thus this will be considered in the topic specific EIAs.

6.7.4 Proposed Approach to EIA

Baseline Studies

A desk-based review of publicly available data will be conducted, including the Pentland Firth and Enabling Actions Report (Robinson and Lepper, 2013) which presents a review of underwater noise emissions from a number of tidal and wave energy devices. The review will also include the range of source noise levels likely to be generated by different marine renewable devices, noise generating instrumentation and installation, maintenance and decommissioning activities. No impulsive piling will be undertaken as part of the project but drilled piles, if used, will be included in the review.

Assessment of Effects

The review will include publicly available data from a range of devices, and demonstrator and test sites. Based on the typical noise source data and previous assessments, an estimation of potential range of injury and disturbance for fish and marine mammals will be conducted. It is proposed to use the most recent scientific evidence and thresholds to inform the assessment, including NMFS (2018) for marine mammals and Popper *et al.* 2014 for fish. The potential impacts on benthic ecology will be considered, with particular focus on SAC qualifying habitat features.

Potential Cumulative Impacts

The MOD firing range is located to the south of East Pickard Bay, cumulative impacts will be assessed in line with the firing operations. Cumulative impacts will also be considered as part of relevant EIA topic specific Chapters including Marine Mammals (Chapter 6.4) and Fish and Shellfish (Chapter 6.3).

6.8 Onshore Noise and Vibration

6.8.1 Introduction

This Chapter will provide an assessment of potential onshore noise and vibration effects on receptors within the Study Area during the installation, Operation and Maintenance, and decommissioning phases of the Project.

6.8.2 Study Area

There is no national government guidance or legislation on the extent of the Study Area to adopt for the assessment of installation or operational noise impacts from the proposed development on receptors. The adopted Study Area has therefore been chosen based on professional judgment of the distances over which significant noise effects may occur, and consideration of the likely magnitude and duration of impact and the sensitivity of receptors.

The proposed Study Area for installation and decommissioning noise effects will extend 1.5 km in all directions from the site boundary area of any works associated with the installation of the onshore cabling and temporary onshore control station for East Pickard Bay.

The proposed Study Area for operational noise effects will extend 1.5 km in all directions from the boundary of the temporary onshore control station are East Pickard Bay.

6.8.3 Baseline Information

East Pickard Bay is located in a rural coastal area, with residential dwellings to the north, east and south of onshore infrastructure and cabling, and a temporary, seasonal beachside café 80 m to the south of control station Option 3 (Figure 2-4). Pembroke refinery, the closest industrial operation in the area, is two km north-east of the Study Area boundary.

The existing sound levels at nearby receptors are likely to be very low, especially during the night when traffic flow on the local highway network decreases. The dominant sources of sound likely to be currently affecting the site are distant and local road traffic, agricultural machinery and processes within the adjacent fields as well as wind, sea and the MOD test firing range.

6.8.4 Proposed Approach to EIA

Baseline Studies

Due to the rural location of the site, existing baseline sound levels at the receptors within the assumed Study Areas is likely to be very low. As such, it is not deemed necessary to characterise the existing baseline sound environment through attended or unattended surveys. Appropriate assumptions would be made on the existing sound environment based on professional experience of other schemes in similarly rural locations. Conservative background sound levels would be used following discussions with the appropriate stakeholders, to ensure a robust assessment of potential noise impacts.

Identification of sensitive receptors

Prior to undertaking the assessment, a desk-based review of the surrounding area will be undertaken to identify all potentially noise sensitive receptors within the Study Area for installation, Operation and Maintenance, and decommissioning noise. The assessment will consider sensitive receptors, principally residential dwellings but also commercial buildings, public footpaths and other recreational areas within the Study Area. Effects on wildlife will be considered under Chapter 6.6 Onshore Ecology.

Initial nearby sensitive receptors have been identified at each of the temporary onshore control station options:

- Option 1
  The nearest residential properties to proposed temporary onshore control station are at Starmans Hall (670 m north-east) and Gupton Farm (760 m south-east). Café Môr, a temporary, seasonal (summer) café, is located 800 m south-south-east of the proposed temporary onshore control station.
- Option 2

The nearest residential properties to the proposed temporary onshore control station are at Starmans Hall (620 m north-east) and Gupton Farm (1 km south-east). Café Môr, a temporary, seasonal (summer) café, is located 1 km south-south-east of the proposed temporary onshore control station.

- Option 3
  The nearest residential properties to the proposed temporary onshore control station are at Rocket Cart House (500 m north-west), Broomhill Cottage (300 m south), Jeffersonwalls (800 m north-east), Broomhill Farm (770 m north-east) and Hardings Hall (900 m north-west). Café Môr, a temporary, seasonal (summer) café, is located 80 m north of the temporary proposed onshore control station.
- Option 4
  The nearest residential properties to the proposed temporary onshore control station are at Carters Green (470 m north-east), Hubberton (577 m north) and Bangeston (757 m north east).

Assessment of Effects

A review will be undertaken of local and national government policy relating to noise, and also of relevant standards and guidance. From this, a matrix of noise assessment criteria will be developed. The predicted installation, Operation and Maintenance, and decommissioning noise levels will be assessed in accordance with the impact matrix and conclusions drawn on the significance of any noise impacts.

Installation and Decommissioning

Some installation works have the potential to cause adverse noise effects during the installation phase. The main sources of noise will likely be plant associated with cable trenching and associated earthworks. Installation activities will be of very short-term duration (< 1 week).

Effects from installation noise will be considered with respect to the guidance in BS 5228:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise', the Welsh Government TAN 11: Noise (TAN11), CL-05-15 updates to TAN11 and relevant local policy. Owing to the temporary nature, short duration and lack of sensitive receptors nearby, it is anticipated that a qualitative approach to the noise assessment will be adopted. The assessment will consider the potential for significant effects to arise with respect to the magnitude of noise from the works, the sensitivity of receptors, and the duration of the works.

Due to the rural nature of the location, it is considered that traffic generation on the local highway network associated with the installation of the META Project is likely to be low and significant noise impacts are unlikely. However, in order to present a robust assessment, noise impacts from increased traffic flow as a result of this phase will be predicted based on the calculation method contained within the Calculation of Road Traffic Noise (CRTN) and assessed against noise change criteria in the Design Manual for Roads and Bridges Volume 11 Section 3 Part 7 Noise and Vibration (DMRB).

Given that levels of vibration attenuate rapidly through the ground within a few metres, it is considered that any vibration effects as a result of installation activity are unlikely to result in a significant environmental impact at noise sensitive receptors within the adopted Study Area and as such, will be scoped out of assessment.

Operational

During the operational phase of the proposed development, noise resulting from the operation of the temporary onshore control station and associated power generators has the potential to cause adverse effects at nearby receptors.

The operational noise assessment will consider noise effects from the operation of the temporary onshore control station in accordance with BS 4142:2014, TAN11, CL-05-15, updates to TAN11 and relevant local planning policy. In accordance with the assessment procedure set out in the Standard, noise from a worst case 1-hour period during the daytime (07:00 – 23:00 hrs) and 15-minute period during the night-time (23:00 – 07:00 hrs) will be predicted at the noise sensitive receptors. This assessment will consider the expected duration, frequency and onset of the noise impacts as well as the character of the noise and the context in which the noise occurs, as required.

It is considered that traffic generation on the local highway network associated with the operation of the proposed development is likely to be negligible. A significant noise impact as a result of an increase in traffic flow during the operational phase is unlikely and therefore it is proposed to scope this out of the assessment.

There are no large items of rotating plant or vibration inducing plant items proposed as part of the development. As such, any operational vibration effects are likely to be negligible and it is therefore proposed to scope operational vibration out of the assessment.

Measures Adopted as part of the Project

If necessary, restrictions on working methods and/or working hours for specific activities will be specified. The noise models will be updated to reflect the proposed mitigation measures and the extent of any residual noise impacts will be identified.

The following will be adopted as part of the project:

- Development of and adherence to an EMP; and
- Development of and adherence to an EMMP.

Potential Cumulative Impacts

The MOD firing range is located to the south of East Pickard Bay, cumulative impacts will be assessed in line with the firing operations. The potential for cumulative noise impacts with other industrial operations will be assessed, however it is likely that this will scoped out.

6.9 Commercial Fisheries

6.9.1 Introduction

This Section of the Scoping Report identifies the commercial fisheries receptors which are of relevance to the META Project. It considers the potential impacts from the installation, Operation and Maintenance, and decommissioning of the META Project on commercial fisheries activity.

6.9.2 Study Area

Fishing activity is spatially and temporally variable. The nature of the transitory fish and shellfish in the Waterway results in fishing vessels following the highest abundance of fish. For the purposes of the META commercial fisheries EIA the Study Area has been defined as:

- Milford Haven Waterway– defined as the area inclusive of the Waterway and extends 12 NM from St Govan's Head to Skomer Island (Figure 6-14).

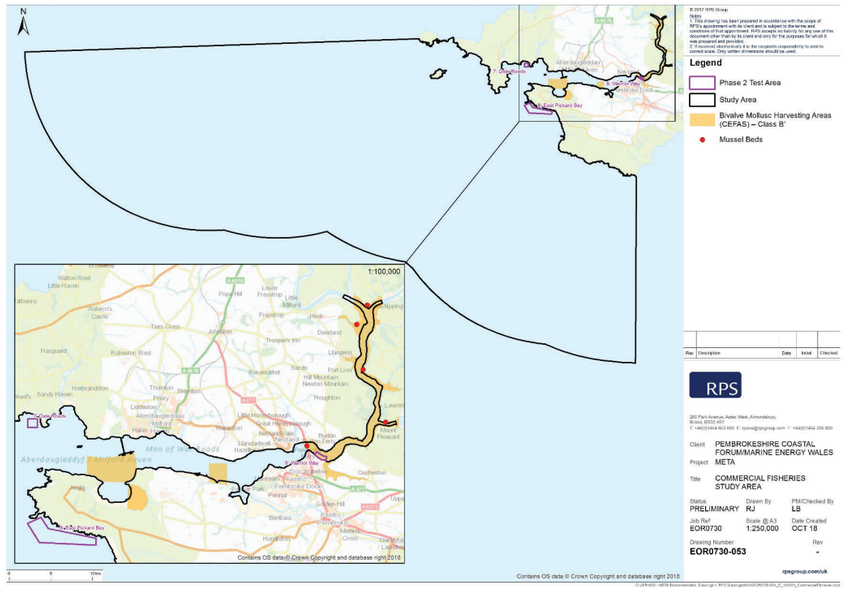

Figure 6-14: Commercial Fisheries Study Area with Bivalve Harvesting Areas

6.9.3 Baseline Information

Baseline Studies

An initial desk-based review of literature and data sources to support this Scoping Report has highlighted the following data sources which provide coverage of the commercial fisheries Study Area:

- Landing Statistics: For the six-year period, 2012 to 2017, nationally registered fishing vessels operating within the Waterway area, and landing to their home nation ports, which include the UK, Netherlands and France (MMO, 2018);
- Effort Statistics: For the six-year period, 2012 to 2017, nationally registered fishing vessels operating within the Waterway area by EU Member States (MMO, 2018);
- Aerial Surveillance Data: For the five-year period, 2013 to 2017, Aerial Surveillance Data for vessels greater than 10 m in length operating within the Waterway area (MMO, 2018);
- Vessel Monitoring System (VMS) Data: For the five-year period, 2013 to 2017, VMS data (effort, landings (tonnes) and value (pounds sterling)) for vessels greater than 12 m in length operating within the Waterway area (MMO, 2018); and
- A review of primary and grey literature reports on fishing activity within the Milford Haven.

It should be noted that the above datasets do not cover all fishing activity in the commercial fisheries regional Study Area as landings and effort statistics generally only record data for vessels (UK and non-UK vessels) landing in the UK and UK vessels landing at European ports. However, most of the fishing effort in the vicinity of the META project is likely to be local UK vessels fishing in inshore waters and therefore will record their catch in UK datasets. In addition, it should also be noted that the aerial surveillance and VMS datasets only covers vessels larger than 10 m and 12 m respectively. However, published data does provide some details of the fishing activity undertaken in inshore areas (e.g. Walmsley and Pawson, 2007, ESFJC, 2010) and this data has been utilised to provide some context to this activity.

Milford Haven Waterway Study Area

All European marine fisheries are managed within the European Union Common Fisheries Policy (CFP), which was agreed between Member States in 1983. These fisheries can be divided into four main fisheries sectors including demersal, pelagic, shellfish and migratory species. The Welsh government enforce fisheries management measures up to 12 NM, with inshore fisheries (0-6 NM) protected under the South Wales inshore fishery legislation (SWIFL).

Milford Haven is a remote town where fishing presents a valuable economic resource. Tourism is also a vital part of the local economy and may result in higher demand from the restaurant and hotel trade for a wide range of fresh, locally caught fish and shellfish.

Fishing in Milford Haven occurs within the estuary but is predominantly undertaken in coastal and offshore waters. A variety of fishing methods are used, such as long lines and trawls, seine, tangle and gill nets, dredging and pots, although gill and tangle nets, and trawls are the main gears used within the Haven itself for finfish species. There are restrictions and statutory instruments in place. These instruments set minimum size limits, denote restricted areas, and periods the restrictions apply, as well as detailing regulations on the methods used for catching fish, including netting and potting.

Commercial fisheries

Milford Haven is considered as a “major port” within the DEFRA network of commercial landings recording. Statistics for the major ports are published annually by DEFRA, and for the major sea areas defined by the International Council for the Exploration of the Sea (ICES). Records for Milford Haven however throw little light on the local fishing activity within the Haven as much of the catch relates to the offshore fleet and those operating outside the Haven. SWIFL Byelaws are currently

in place outlining minimum size of catch, restrictions of fishing areas, and type of fishing gear that can be used.

An offshore fleet of around 43 British-registered vessels of Spanish ownership or origin are based in Milford Haven port. These boats fish in the Irish Sea, west of Scotland, in the Bristol Channel and south of Ireland, often entering the 12-NM zone in the last two areas and may land their catches at Milford Haven, but more often in Spain. Three or four local inshore trawlers between 8–12 m length fish within Carmarthen Bay, Swansea Bay and the Bristol Channel for a mixed catch of white fish. One or two vessels dredge for scallops during the winter and set longlines for spurdogs *Squalus* spp., rays, cod *Gadus* spp., conger eel *Conger* spp. and ling *Molva molva*. As of 2017, landings reported by UK vessels into Milford Haven, recorded 15,000 tonnes of demersal, pelagic and shellfish amounting to £3.5 million (MMO, 2017) A further breakdown of landing in Milford Haven (Cefas, 2006), can be found in Table 6-19.

Table 6-19: Summary of landings in 2006 (Cefas, 2006)

	Landed weight (t)	Landed value (£1,000s)
Finfish		
Cod	28	48
Other Gadoids	247	472
Sole	40	348
Turbot and brill	13	89
Other flatfish	491	1048
Small pelagic	6	3
Bass	32	183
Other finfish	365	992
Shark and rays	210	332
Shellfish		
Whelks	432	280
Gastropods	0	0
Scallops	51	445
Cockles	925	375
Other bivalves	898	140
Edible crabs	294	568
Other crab	369	446
Lobsters	97	1712
Nephrops	49	350
Shrimps and prawns	3	50
Cephalopods	30	41
Total	**4579**	**7921**

Demersal

Flatfish and rays (principally thornback) are taken in fixed nets (e.g. tangle, trammel and stake nets) and otter and beam trawls from spring through to the end of the year. Boats using gill nets and otter trawls take cod and whiting during the colder months. Large-meshed tangle nets are used for rays and large flatfish such as turbot. The ray fishery has expanded since the mid-1980s and is mostly fished by three larger trawlers that work between 3–6 NM from shore. Stake nets set along sandy shores are tended to at low tide and commonly take flatfish such as flounders, dabs and plaice.

Pelagic

Adult fish visiting the estuary seasonally to feed, include mackerel (August to October) and monkfish *Lophius piscatorius* (summer to autumn). In national fish stock terms this is considered negligible. Mullet *Mugil cephalus*, herring (*Clupea spp*), plaice *Pleuronectes platessa*, sole *Solea vulgaris*, turbot *Scophthalmus maximus*, brill *Scophthalmus rhombus*, ray and mackerel are taken in the lower Haven using gill and tangle nets.

The presence of a local race of the herring *Clupea* spp., in waters of the Daugleddau (distinguished by its spring spawning habit between February and April with spawning peaking in March), supports a fishery which uses bottom-set gill nets and is centred around Llangwm (Pawson *et al.*, 2002). This herring sea fishery is reported by Fawley Laboratories (1995) as locally significant.

Gill netting for bass and mullet also takes place, but it is not permitted upstream of the Cleddau Bridge, to protect salmon and sea trout. An area in Pembroke Bay around the power station outfall is a designated bass nursery area where fishing for sea fish from a boat is prohibited between 1 May and 31 October.

Shellfish

Shellfish harvesting sites are classified from A to C according to the EU Food Hygiene Regulations (852/2004, 853/2004 and 854/2004) implemented in Wales through the Food Hygiene (Wales) Regulations 2006 (SI 2006/31). Grade A sites do not require pre-treatment and grade C sites require intensive purification (Figure 6-14). A fourth category exists, and harvesting is prohibited within these areas.

The EC Shellfish Waters Directive (79/923/EEC), adopted 30th October 1979, aims to protect or improve shellfish waters to support shellfish life and growth, therefore contributing to the high quality of shellfish products directly edible by humans. There are two areas within Waterway that have been designated as shellfish waters under this Directive. The waters within the Carew river were designated shell fish waters from 11th October 1999. The Milford Haven Cleddau (east and western Cleddau rivers) was also designated in 1999, however, following a review of designations in 2003/2004, the area was extended in March 2004 (Figure 6-14).

Historically, the Waterway has been harvested for wild cockles and Pacific oyster and in recent years the fisheries market has grown to include permits for carpet shell clams *Ruditapes decussatus*, razor clams *Pharidae* spp. and native oysters *Ostrea edulis*. The large area and diverse marine habitats and sediment types, results in a variety of shellfish species. These include the native oyster, mussels *Mytilus edulis*, lobsters *Homarus gammus* and Prawn *Palaemon serratus*, some of which have conservation and commercial interests.

As of 2006, forty boats were involved in the pot fishery, only two of which are greater than 10 m length. The larger vessels set up to 1200 pots each out to 30 NM offshore around the Smalls. The smaller boats set pots within a few miles of the coast for lobsters, brown crab and, recently, velvet crabs. A few tangle nets are set in rocky areas for crawfish but netting for spider crab is far more widespread. Many of the <10 m fleet are involved in netting. Native oyster beds in the Haven support a small autumn fishery

Migratory species

Gill and tangle netting for bass takes place within the Haven, but as set netting may catch salmon and sea trout, it is not permitted upstream of the Cleddau Bridge. The Waterway acts as a migration corridor for anadromous species (sea trout *Salmo trutta*, Atlantic salmon *Salmo salmo* and European eel *Anguilla anguilla*) moving in and out of the Cleddau rivers. There is an established migratory fishery in both the eastern and western Cleddau rivers, although little specific information is available (Hobbs and Morgan, 1992). Seven compass nets are licensed to take salmon and sea trout in the upper regions of the Haven from 1 June to 31 August.

Recreational Game Fishing

For recreational fisheries, in addition to direct spend on the sport, much of the benefit derives from the use by visiting anglers of overnight accommodation and catering facilities. Recreational angling can be subdivided into game, coarse and sea angling. Recreational fishing data is limited for the Milford Haven Waterway study area, often relating to byelaw restrictions, catch sites and fishing quota per species (e.g. for the period 1 October to 31 December 2018 recreational fishers may retain 1 fish per day per person as a 'bag limit' for personal consumption for sea bass (Welsh Government Guidance, 2018). Sea trout is likely to be the most important game fishing species.

6.9.4 Proposed Approach to EIA

The EIA will consider the potential effects of the Project on commercial and recreational fishing activity within the commercial fisheries Study Area. The impact assessment will consider both direct and indirect potential impacts. These impacts are expected to be localised and short lived during the installation and decommissioning phases of the Project, and highly localised during the operational phase of device testing. They will be assessed based on an understanding of the local fisheries statistics and the nature of the proposed activities.

Assessment of Effects

A range of potential impacts on commercial fisheries have been identified which may occur during the installation, Operation and Maintenance, and decommissioning phases of the META Project. The potential impacts that have been scoped into the META commercial fisheries EIA are outlined in Table 6-20 below, together with a description of any additional data collection (e.g. site-specific surveys) that will be required to enable a full assessment of the impacts.

Table 6-20: Impacts to be assessed in the Commercial Fisheries EIA

Impact no.	Impact	Justification	Proposed approach
Installation and Decommissioning Phases			
1	Interference with commercial and recreational fishing activity.	Increased vessel traffic within fishing grounds as a result of changes to shipping routes and installation vessel traffic associated with the META project may result in fishing fleets suffering increased interaction with other fishing vessels as fleets deviate away from or around disturbed areas.	Detailed analysis of existing datasets outlined above will be utilised to characterise the status of historic commercial fisheries patterns across the area and predict the potential impacts upon future commercial fishing activities.
2	Displacement or disruption of commercially important fish and shellfish resources.	Potential impacts on fish and shellfish which may impact the populations of key commercial species may result in reductions in the availability of these species to	Based on the results of the fish and shellfish ecology assessment (Chapter 6.3), the assessment will examine

Impact no.	Impact	Justification	Proposed approach
		the fisheries that target them, resulting in decreased catch rates and total catches.	whether there is the potential for reduced availability and abundance of key species.
Operation and Maintenance			
3	Gear snagging within the East Pickard Bay area.	Potential for snagging fishing gear on communications cable and the marine renewable devices.	As above for commercial fisheries impact no. 1
4	Displacement or disruption of commercially important fish and shellfish resources.	Displacement or disruption of commercially important fish and shellfish resources (e.g. potential EMF effects from marine renewable dives and communications cables) has the potential to displace or disrupt fish species making them less abundant in the area.	As above for commercial fisheries impact no. 2
5	Interference with fishing activity.	Increased vessel traffic within fishing grounds as a result of changes to shipping routes and maintenance vessel traffic associated with the META project may result in fishing fleets suffering increased interaction with other fishing vessels as fleets deviate away from or around the META area.	As above for commercial fisheries impact no. 1

Knowledge of the baseline environment and the proposed activities have allowed impacts to be scoped out of the assessment, where there is considered to be no receptor-impact pathway (Table 6-21).

Table 6-21: Impacts proposed to be scoped out of the commercial fisheries EIA

Impact	Justification
Reduction in access to, or exclusion from, established fishing grounds within the Waterway area.	No Phase 2 sites prohibit access to fishing grounds. Whilst an exclusion zone may be implemented within the installation phase of the project, this will not obstruct or impede fishing vessels from reaching fishing grounds and as such is assessed as a negligible impact.

Potential Cumulative Impacts

The potential for the following projects or activities will be considered within the commercial fisheries EIA Study Area (the maximum adverse scenarios for each of the projects will be assessed) for each META site supporting Phase 2 activities:

- Oil and gas infrastructure/development (cables and pipelines);
- Pembroke Dock Marine;
- Navigation and shipping; and
- Aggregate extraction and disposal of dredging spoil.

The CIA will consider the same impacts across all phases of the project as outlined in the Assessment of Effects Section above.

6.10 Shipping and Navigation

6.10.1 Introduction

This Section of the Scoping Report identifies the shipping and navigation receptors of relevance to the META Project and considers the potential impacts from the installation, Operation and Maintenance, and decommissioning of the offshore and intertidal components (up to the MHWS mark) of the Project on these shipping and navigation receptors.

6.10.2 Study Area

For the purposes of the Navigational and Shipping assessment, the Shipping and Navigation Study Area has been defined as:

- Milford Haven Waterway– defined as the area inclusive of the Waterway and extends up to the twelve NM limit, from St Govan's Head to Skomer Island (Figure 6-15).

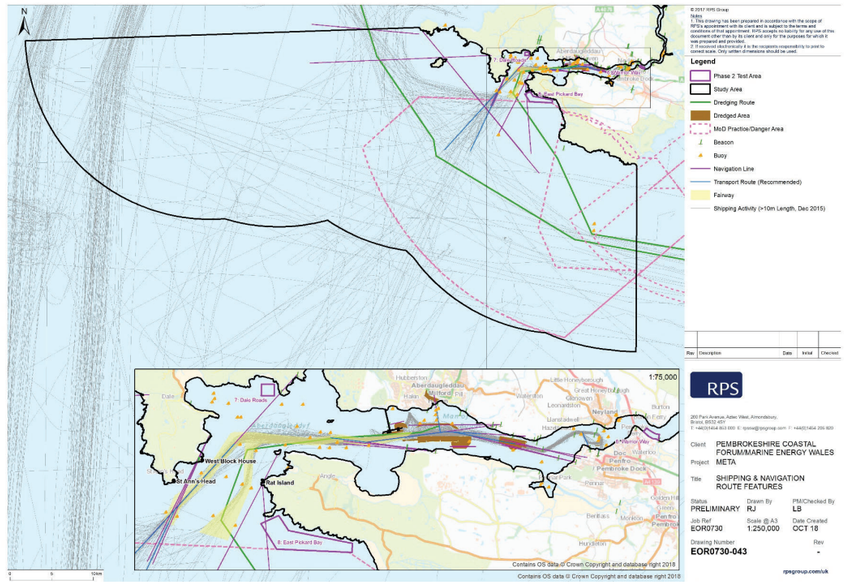

Figure 6-15: Shipping and Navigation Study Area and Features

6.10.3 Baseline Information

Baseline Studies

The baseline datasets available to inform the shipping and navigation EIA are outlined in Table 6-22.

Table 6-22: Shipping and Navigation baseline data sources

Topic	Data Source
Fishing vessel data	• Anatec UK Ltd.; and • SeaZone Solutions Limited.
Recreational vessels	• RYA Cruising Routes and Areas (RYA, 2005); and • RYA (2016) UK Atlas of Recreational Boating.
Cables and Pipelines	• SeaZone Solutions Ltd.; and • Sea Fish Industry Authority.
Admiralty charts and pilot books	• Navigational information (e.g. Aids to Navigation, IMO routeing measures, charted wrecks, etc.).
Disposal sites	• SeaZone Solution Ltd.
Marine aggregate extraction	• Milford haven Facilities – site specific dredging reports (various); and • British Marine Aggregate Producers Association (BMAPA) GIS Shapefile of Dredger Routes.
MoD training and practise and exercise areas	• SeaZone Solutions Ltd.; and • MOD shapefile.

Shipping and Navigation Study Area

The Waterway is one of the deepest natural harbours in the world, with water depths typically ranging from 10 m upstream to 20 m in the main channel. As a deep natural harbour, it is a busy shipping channel used by ferries travelling from Pembroke Dock to Ireland, oil tankers and pleasure craft.

The large port of Milford Haven (PoMH) contains several oil and gas refineries serviced by coastal tankers which transport oil and gas products to the Bristol Channel, and which therefore pass close to Dale Roads (Site 7) and East Pickard Bay (Site 8). Shipping operations in Milford Haven are managed by the MHPA, a statutory harbour authority. It handles 29% of the UK's seaborne trade in oil and gas. The authority also owns and operates the Milford Marina, Fish Docks and port facilities at Pembroke Dock.

Commercial vessels

The Waterway is closely managed by the MHPA to ensure the protection and sustainable management of the marine environment, and to provide effective and efficient movement of vessel traffic. The main transport routes and other activities from SeaZone Ltd. data have been identified for the META Project in Figure 6-15.

Access to the Waterway for large tankers and other commercial vessels is through a narrow passage, passing beneath the lighthouse on St Ann's Head (Figure 6-15). The smallest distance between the narrow passage at West Blockhouse point, to the east of St Ann's Head, and Rat Island, on the opposing headland, is approximately 2.32 km (Figure 6-15). Due to the narrow passage being

the only entrance available to vessels, the passage often results in heavy commercial vessel traffic at this point. The vessel activity passing through the outer Waterway relating to the port's operational activities includes tugs, service and pilot vessels, with occasional dredging operations carried out as part of port maintenance and commercial development. The Pembroke Dock ferries regularly pass through the Waterway to Fishguard, across the Bristol Channel, and to locations east of Milford Haven, such as Tenby.

Fishing vessel density

Fishing occurs within the META shipping and navigation Study Area, further detail on commercial fishing activity is provided in Chapter 6.9.

Recreational user activity

Recreational activity is defined for the purpose of the shipping and navigation assessment as sailing and motor craft (including those undertaking dive/fish excursions) of between 2.5 m and 24 m in length. There are also sailing and power boat routes, and boarding/surfing zones within the Study Area. A plot of the recreational activity, based on the latest RYA Cruising Routes (RYA, 2016), is presented in Figure 6-16. Automated Identification System (AIS) and radar detection data will be used to identify further vessels within the study area

Search and Rescue

Search and Rescue (SAR) within the UK is coordinated by the Maritime and Coastguard Agency (MCA), with other organisations providing declared assets to undertake SAR operations.

The MCA provides a coordination service for SAR, counter pollution and salvage through a National Marine Operations Centre at Fareham (operational since September 2014), supported by a network of Coastguard Operation Centres situated throughout the UK. META falls within the area of responsibility of the Milford Haven Coastguard Operation Centres.

The Royal National Lifeboat Institute provides a 24-hour SAR service maintaining a fleet of over 340 lifeboats positioned around the coast of the UK and Ireland. There are a number of lifeboat stations positioned along the west coast of Wales that operate a variety of both smaller (open-deck) inshore lifeboats, and larger all-weather lifeboats, that are capable of high speed and able to safely undertake operations in all weather. The closest lifeboat station to the Project is Angle, located in the mouth of the Waterway.

Navigational features

There is a lighthouse at St Ann's head (Figure 6-15) at the entrance to the Waterway and commercial navigational lights, markers and buoys along the approaches. META Project sites will be situated throughout the Study Area, where some of the busiest shipping routes presently operate and safely co-exist alongside a number of marine activities including:

- Commercial fishing activities;
- Recreational activities;
- Telecommunications cables and interconnectors;
- Disposal sites;
- Marine aggregate extraction areas; and
- MOD test areas.

Warrior Way

AIS detected vessels in the vicinity of Warrior Way (Site 6) is 1000-5000 vessels per year. Only one marker buoy is recorded within the Warrior Way site boundary.

Kayaking, day boats, water skiing, jet boats, dingy sailing and watercraft activity takes place within the Warrior Way site, and upriver from the Cleddau Bridge (Figure 6-16). Pembrokeshire Performance Sailing Academy is located to the south east of the site at the mouth of Cosheston Pill, incorporating both a boat yard and slipway. Angling and wildlife watching from both the shore and boats in the general area of Warrior Way is popular although some restrictions exist for angling by the MHPA and The Welsh Government Fisheries.

Dale Roads

Dale Roads (Site 7) is adjacent to the mouth of the Milford Haven and north of the heavy shipping lanes used by commercial vessels. Use of this area by commercial vessels is limited due to restricted water depths present. Less than 1000 vessels are recorded by AIS in the area per year.

There is a sea angling location to the south of the site which may account for a large proportion of the vessels recorded by AIS. Sea angling is especially popular with small craft often anchored just off to the south of Dale Roads (Site 7), as well angling from rocks and beaches. Kayaking, rowing and windsurfing occur around this area of coast. Dinghy and yacht sailing activity, including racing, takes place in the area. Wildlife boat trips come out from Dale or pass through these waters. A dive site can be found to the south of the Dale Roads, off Great Castle Head (Figure 6-16).

East Pickard Bay

Fewer than 1000 vessels are recorded by AIS within the East Pickard Bay area (Site 8). There is a navigation line located on the western side of the site, which may be used by commercial ships.

Cruiser sailing, and power boating takes place throughout the East Pickard Bay area (site 8), however navigation is dangerous close to shore due to hidden submerged rocks therefore numbers of vessels passing through inshore waters are likely to be low. The Castlemartin MOD firing range is located to the south of the site. Surfing and windsailing are highly popular off the Freshwater West beach (Figure 6-16). Kayaking occurs along the coast including the northern boundary of the site, and sea angling occurs throughout the area. There is a dive location to the north, adjacent to Castle Bay (Figure 6-16).

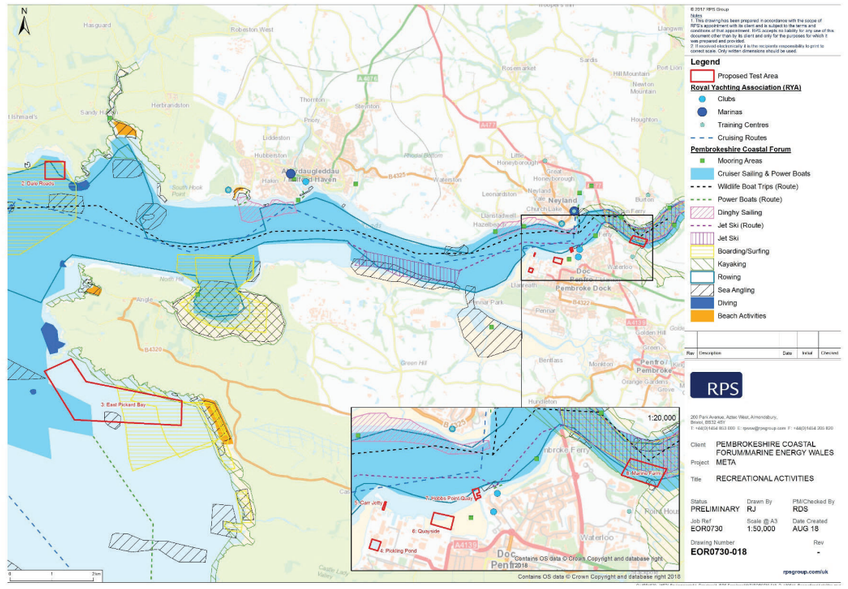

Figure 6-16: Recreational areas within the Study Area

6.10.4 Proposed Approach to the EIA

Shipping and navigation is assessed primarily in accordance with guidance provided by the statutory consultees. The MCA require that their methodology is used as a template for undertaking the EIA (see MCA, 2013). This template is centred on risk management that demonstrates that sufficient controls are, or will be, in place for the assessed risk (base case and future case) to be judged as broadly acceptable or tolerable. To comply with these requirements, MEW intend to work with the MHPA to provide a Navigation Risk Assessment (NRA) that considers both the Pembroke Dock Marine project and the META project.

As such, the EIA for shipping and navigation follows the methodology presented in Section 4.3.2 but will present and assess risk within the assessment of magnitude.

Assessment of Effects

A range of potential impacts on shipping and navigation have been identified which may occur during the installation, Operation and Maintenance, and decommissioning phases of the Project. Other potential impacts may be identified following the results of this scoping exercise. The impacts that have been scoped into the assessment are outlined in Table 6-23, together with a description of any additional data collection that will be required to enable a full assessment of the impacts.

Table 6-23: Impacts to be assessed in the Shipping and navigation EIA

Impact No.	Impact	Justification	Proposed approach
Installation and Decommissioning			
1	Reduction in navigable water depth for commercial, fishing, and recreational vessels.	Presence of marine cable and marine renewable devices may reduce navigable water depths thereby potentially reducing area of navigable water to commercial vessels, fishing and recreational vessels.	Data from AIS will be used to inform the Navigational Risk Assessment (NRA). The NRA will be used to inform the assessment.
Operation and Maintenance			
2	Reduction in navigable water depth for commercial, fishing, and recreational vessels.	Presence of marine cable and marine renewable devices may reduce navigable water depths thereby potentially reducing area of navigable water to commercial vessels, fishing and recreational vessels.	As above for shipping and navigation impact no. 1.

Knowledge of the baseline environment and the proposed activities have allowed some impacts to be scoped out of further assessment. This has been concluded where there is considered to be no receptor-impact pathway. The potential impacts that have been scoped out of further assessment are presented in Table 6-24.

Table 6-24: Impacts proposed to be scoped out of the navigation and shipping EIA

Impact no.	Impact	Justification
Installation and Decommissioning		
1	Diminished emergency response capability (including SAR) within the Waterway during installation.	Given the location and short-duration installation/decommissioning periods (days) it is considered that there will be negligible impact to onsite emergency response capability as a result of installation or decommissioning activities associated with the Project.
2	Diminished pollution and salvage response capability for emergency responders.	Given the location and short-duration installation/decommissioning periods (days) it is considered that there will be negligible impact to onsite emergency response capability as a result of installation or decommissioning activities associated with the Project.
3	Increased collision risk for sea users transiting the area where the offshore communications cable is located at East Pickard Bay.	The marine section of the communications cable will be laid on the sea bed with clamshell weights to maintain it in position, to an anchor point 50 m from the point of MLWS. It is also located away from any Shipping and Navigation routes, therefore potential increased collision risk to sea user from the installation or decommissioning of the marine cable is considered to be negligible.
4	Increased collision risk to vessels without captain including commercial vessels, recreational users and commercial fishing vessels in an emergency situation (including machinery related problems or navigational system errors).	Given the location and short-duration installation/decommissioning periods (days) it is considered that there will be negligible impact to increased collision risk as a result of installation or decommissioning activities associated with the Project. This will also be covered under the EMMP.
Operation and Maintenance		
5	Potential deviations to commercial routes.	Locations of META sites are not within direct commercial routes, and as such negligible impact can been assumed.
6	Increased risk of anchor snagging of commercial vessels and commercial fishing vessels (in transit).	Given the location of the communications cable at East Pickard Bay away from commercial navigation routes, and the shallow depth presenting a risk to vessels, the potential for anchor snagging is considered to be negligible.
7	Diminished emergency response capability within the Waterway (including SAR).	Given the location and scale of META sites, it is considered that there will be negligible impact to onsite emergency response capability as a result of operational or maintenance activities associated with the Project.

Impact no.	Impact	Justification
8	Diminished pollution and salvage response capability for emergency responders.	Given the location and scale of META sites, it is considered that there will be negligible impact to onsite emergency response capability as a result of operational or maintenance activities associated with the Project.
9	Electromagnetic interference for vessels using magnetic compasses.	The marine Section of the communications cable will be laid on the sea bed with clamshell weights to maintain in position to an anchor point 50 m from the point of MLWS. It is also located away from any Shipping and Navigation routes, and will carry a low voltage therefore potential for EMF impacts are considered to be negligible.

Potential Cumulative Impacts

Cumulative impacts will be considered as part of relevant EIA topic specific Chapters including Marine Mammals (Chapter 6.4) and Fish and Shellfish (Chapter 6.3).

6.11 Historic Environment

6.11.1 Introduction

This Chapter will identify historic environment receptors of relevance to the META Project and considers the potential impacts and effects from the installation, Operation and Maintenance, and decommissioning of the onshore components (above MHWS) of the Project on these receptors. Specifically, the following receptors are considered:

- World Heritage Sites;
- Landscapes of Outstanding Historic Interest in Wales;
- Listed Buildings (both nationally and locally listed);
- Conservation areas;
- Registered Parks and Gardens;
- Historic Battlefields recorded on the Inventory of Historic Battlefields in Wales;
- Scheduled Monuments; and
- Other undesignated buried and above ground heritage assets.

6.11.2 Study Area

The archaeology Study Area for the Historic Environment is defined as:

- East Pickard Bay (site 8) – defined as the onshore communications cable route search area above MHWS and the potential locations of the temporary onshore control station, inclusive of archaeology in a 1 km buffer of the temporary land take areas. A wider search up to 5 km will be implemented during the EIA to assess impacts on designated assets (Figure 6-17).

As no onshore works are proposed at either Dale Roads or Warrior Way, these META sites have been scoped out of further consideration.

6.11.3 Baseline Information

Baseline Studies

A Historic Environment Desk-based Assessment ('DBA') will be prepared in line with current best practice. This DBA will examine all available sources of information pertaining to the archaeology of the site and surrounding Study Area, and will include archaeological, built heritage and marine heritage assets as well as a consideration of marine archaeology potential (Figure 6-17).

All designated heritage assets will be clearly identified in the DBA. The major sources of information to be consulted will include:

- The Dyfed Environment Record;
- The Pembrokeshire Archives and Local Studies;
- Côf Cymru (the on-line National Historic Assets of Wales Register);
- The National Monuments Record and any other relevant records held by the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW);
- Records of the UKHO wrecks and obstructions provided by SeaZone Ltd; and
- National Library of Wales.

It will also incorporate a site walkover and a review of Aerial photography and LiDAR surveys which cover the site.

The baseline assessment will identify the presence of both designated and non-designated assets within the Study Area and will be undertaken in line with the standard and guidance for the preparation of desk-based assessments set out by the Chartered Institute for Archaeologists (CIfA). This will include identification of all heritage assets that could be affected by the proposed development, provision of a description of the significance (importance) of those assets, including the contribution made by their setting. Setting assessments for designated heritage assets will follow national guidance contained within the Cadw (2017) document Setting of Heritage Assets in Wales.

East Pickard Bay (site 8)

The geology of East Pickard Bay consists of shale and sedimentary bedrock formed approximately 461 to 478 million years ago in the Ordovician Period, local environment previously dominated by open seas with pelagite deposits to the east of East Pickard Bay. To the north lies hard, red calcareous marls with sporadic red and green sandstones, basal beds of green marl, conglomerate and breccia are also present.

The historic landscape character area (west Angle to Freshwater West coastal strip) consists of approximately 7 km strip of high, hard-rock sea cliff topped by a narrow band of moor, scrub and rough ground, with the Pembrokeshire Coast Path running the entire length of this area. The strip is highly cultivated and characterised by many varied archaeological sites such as iron aged forts, military structures, flint-working and dark age sites (Cadw, 2018).

Lying at the mouth of the Waterway, this area has long played an important defensive role. A gun tower was constructed in 1542 at East Blockhouse. A gun battery built on Thorne Island in 1859 was later converted to a fort, and finally to a hotel. In 1901-04 massive gun emplacements were built close the 16th century gun tower. This latter site was in use during World War 2 during which a large camp was constructed as well as many smaller installations. The military still use the site, although the main function of the coastal strip is as a corridor for the Pembrokeshire Coast Path, although access can be restricted by the current MOD firing range.

Designated Heritage Assets

World Heritage Sites

There are no world heritage sites within either the Study Area or the wider 5 km Study Area.

Listed Buildings (both nationally and locally listed)

Within the 5 km wider search area, five Grade II buildings have been returned. These are:

- Corse Bridge and attached walled channel: Campbell's bridge is segmental, approximately 7 m span by 3 m wide, in mortared rubble masonry with deep thin voussoirs. The parapets are about 1 m high with large coping stones and have curved approach wings. Below the bridge is a 25 m long open drainage channel through the dunes 2 m wide with a path on each side, all between retaining walls. The drain enters a culvert at the base of a high retaining cross wall, leading to the sea.
- Seaweed hut on foreshore: The hut is approximately 3.3 m wide by 4.5 m long and stands on a levelled platform cut into the turf. Six rafters each side rest on a base of stones set in the ground and are crossed and nailed at the apex. There is no ridge piece. The rafters are boarded horizontally with 5 cm gaps and reed-thatched. Turf is laid at the apex. There is vertical boarding at each gable. The floor is sand upon which the seaweed would be laid to dry. The door is missing. The listed building is now under the ownership of the National Trust and under care of the Pembrokeshire Coast National Park.
- War memorial: Chamfered Square-Section shaft and arms of the cross, enlarging towards extremities. Figure of Christ crucified with inscription INRI in raised letters on scroll. The cross stands on an octagonal column capped with an enriched late Gothic moulding. Small half-round moulding beneath cap. Half-round moulding and hollow above an octagonal base. The reason for this listing is fine design.
- Lookout Tower and Rocket Cart House (2 x Grade II listed buildings): Built at the end of the C19, the Rocket Cart House was the base for the cliff-rescue team with rockets, lines and breeches-buoys. It was in use until the 1930s, with a team of about 20 rescuers. In about 1970 it was taken as a holiday house and underwent minor alterations. It consists of a cart house originally with double-doors and a three-storey look-out tower. Raised about 0.5 m above the adjacent field level and enclosed on three sides by a red brick wall about 1 m high. At front is a stone-block paved hardstanding area.

Conservation areas

There are no Conservations Areas designated for Freshwater West within the communications cable and temporary onshore control station locations 1 km search area. However, there is the Angle Conservation Area located to the north of the site within the 5 km wider search area (Figure 6-17). This Conservation Area was designated for (PCNPA, 2011):

1. Purpose:
    a. To preserve and enhance appropriately and where possible, sustainably, the special architectural, archaeological and historic qualities which contribute to the character of Angle Conservation Area. To ensure that the special qualities that contribute to the character of the Angle Conservation Area are appreciated, conserved, and enhanced for their historic, architectural and aesthetic value and for the contribution they make to the quality of our lives and the local economy.
2. Objectives:
    a. To ensure that all new works and development respect and add to the special character of the Conservation Area and that no new works detract from or harms its character;
    b. To ensure that the use and management of the Conservation Area respects and adds to its special qualities and that no future use or management detracts from or harms its character;
    c. To ensure the protection and enhancement of the setting of the Conservation Area;
    d. To ensure that development and uses comply with the polices set out in the LDP (within this document key policies are highlighted but it should be noted that the LDP is to be read as a whole and therefore other policies could also be relevant) and the objectives set out in the National Park Management Plan and the Community Plan;

    e. To ensure that historic buildings are conserved using best conservation practices retaining maximum exterior and interior historic fabric, using traditional and where possible, sustainably sourced materials.

Registered Parks and Gardens

There are no Registered Parks and Gardens within the communications cable and temporary onshore control station locations 1 km or the wider 5 km Study Area.

Historic Battlefields recorded on the Inventory of Historic Battlefields in Wales

There are no Historic Battlefields within the within the communications cable and temporary onshore control station locations 1 km search area or the wider 5 km Study Area.

Scheduled Monuments

Following a review of historic wales, two scheduled monuments within the 5 km wider search area comprise:

- Gravel Bay anti-aircraft battery: A WWII heavy anti-aircraft gun battery, situated in enclosed coastal pasture overlooking Freshwater West beach and Gravel Bay to the south. The monument is of national importance for its potential to enhance and illustrate our knowledge of WWII anti-aircraft defences. The well-preserved monument forms an important element within the wider regional context - the defence of the Bristol Channel ports - and the structure itself may be expected to contain archaeological information in regard to building techniques and functional detail.
- Devil's Quoit Burial Chamber: The monument comprises the remains of a chambered tomb, dating to the Neolithic period (c. 4,400 BC - 2,900 BC). The monument is of national importance for its potential to enhance our knowledge of prehistoric burial and ritual. The monument is an important relic of a prehistoric funerary and ritual landscape and retains significant archaeological potential, with a strong probability of the presence of both intact burial or ritual deposits and environmental and structural evidence, including a buried prehistoric land surface. Chambered tombs may be part of a larger cluster of monuments and their importance can further enhanced by their group value

Other undesignated buried and above ground heritage assets.

The withdrawal of the ice sheets from Wales was followed gradually by the recolonization of the area by humans. Deposits of peat thought to represent the remains of a buried forest revealed by erosion have been radiocarbon dated to 5250-4550 BC. Finds from beneath this deposit included a flint tranchet axe, flint flakes and a flint implement, of likely Mesolithic date, whilst a Neolithic midden has been recorded in Broomhill Burrows. There is further evidence for prehistoric activity in the form of isolated findspots of flint tools, and other prehistoric artefacts along with the more visible remains of enclosed settlements and defended promontories.

This area includes the remains of a medieval field system which extends over the Angle peninsula, whilst a number of post medieval and modern wrecks in the vicinity lie testament to the continued importance of shipping in the area. The small wooden shelter at Furzenip is all that remains of a group of approximately four shelters used for the collection of seaweed and for the production of laverbread. The name 'Parsonsquarry' indicates that stone was extracted in the sea-cliff here. The evidence of historic assets in the area clearly suggests that there is potential for impacts on heritage assets ranging from the Mesolithic onwards.

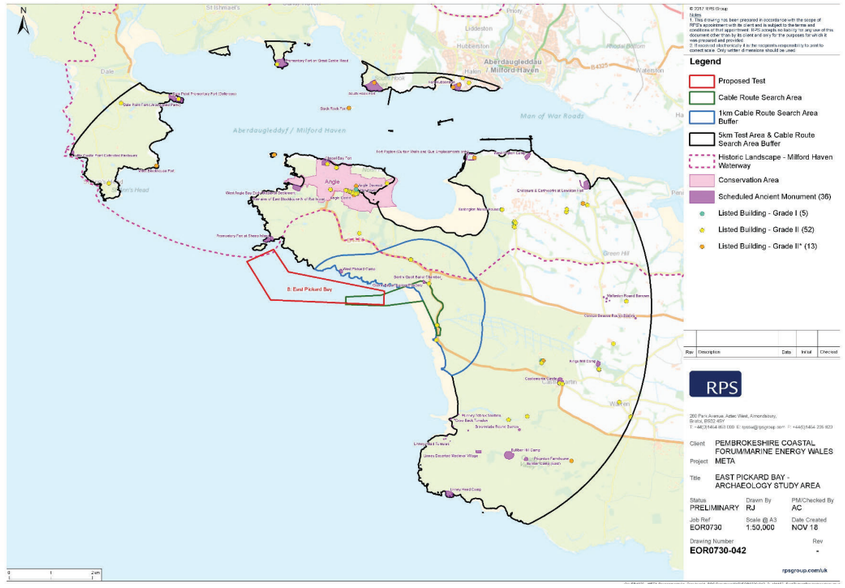

Figure 6-17: Historic archaeology within the Milford Haven

6.11.4 Proposed Approach to EIA

Baseline Studies

The ES Chapter will review the legislative, policy and guidance framework relevant to the historic environment, and the data sources listed in Section 6.11.3.

Assessment of Effects

The significance of potential impacts will be assessed by taking into account the potential magnitude of impacts and the sensitivity of heritage assets.

The assessment of the likely effects on the historic environment will include the following:

- Identification of all heritage assets that could be affected by the proposed development, along with provision of a description of the significance (importance) of those assets including the contribution made by their setting;
- Identification of the likely effects of the proposed development on heritage assets within the site and an appropriate Study Area centred on it; and
- Assessment of significance of effects, taking into account measures proposed to avoid, reduce or offset adverse effects.

Assessment will be in the form of a matrix-based approach that examines the importance or value of the heritage asset against the magnitude of impact on that asset, leading to an identified significance of effect. This approach will be underpinned by a suitable narrative that explains how the importance or value of the asset has been appraised and how the magnitude of impact has been assessed.

Considerations of the significance of historic assets will be undertaken in accordance with current best practice. The magnitude of impacts and the determination of the significance of effects will be determined through the application of professional judgement. The assessment will also be informed by consultation with relevant stakeholders (Cadw, the archaeological advisor to the Pembrokeshire National Park and the RCAHMW).

Assessment of impacts on the Historic Environment is recognised as having significant overlaps with other topics, such as landscape and seascape visual impact assessment, therefore a multi-disciplinary approach to assessment will be adopted. Subject to consultation it may be necessary to consider the impact of the scheme on the Waterway Landscape of Outstanding Historic Interest may need to be considered through a formal Assessment of the Significance of the Impact of Development on Historic Landscape Areas on the Register of Landscapes of Historic Interest in Wales, in accordance with the guidance provided in the 2nd edition of the Guide to Good Practice on using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process –usually referred to as the 'ASIDOHL2' process.

A range of potential impacts on historic environment have been identified which may occur during the installation, Operation and Maintenance, and decommissioning phases of META. The impacts that have been scoped into the assessment are outlined in Table 6-25 together with a description of any additional data collection that will be required to enable a full assessment of the impacts.

Table 6-25: Impacts to be assessed in the Historic Environment EIA

Impact No.	Impact	Justification	Proposed approach
Installation and Decommissioning			
1	Direct impacts on heritage assets.	Installation works at the landfall, cable route and temporary onshore control station could result in temporary loss	A desk-based study of heritage assets to inform cable route and temporary control stations location, inclusive of a clear statement of the potential for

Impact No.	Impact	Justification	Proposed approach
		of, or damage to, buried archaeological assets.	impacts on buried archaeological remains as well as a clear articulation of the known assets within the Site. These impacts will then be assessed in the ES Chapter and mitigation measures designed to reduce or remove these impacts as appropriate.
2	Temporary impacts on the settings of heritage assets.	Both offshore and onshore elements of META (including compounds and temporary accesses) could result in temporary impacts on the settings of designated heritage assets.	The baseline desk-based assessment will identify assets where there is a potential for the Project to impact on the setting of designated historic assets. Any such impacts identified will be articulated in the ES Chapter and mitigation measures identified to reduce or remove these impacts.
3	Temporary impacts on the historic landscape (landfall, onshore cable and temporary onshore control station).	The onshore elements of the Project (including temporary compounds and accesses) could result in temporary impacts on the overall historic landscape.	As above for historic environment impact no. 1.

Knowledge of the baseline environment and the proposed activities have allowed impacts scoped out of the assessment, where there is considered to be no receptor-impact pathway (Table 6-26).

Table 6-26: Impacts proposed to be scoped out of the Historic Environment EIA

Impact No.	Impact	Justification
1	Impacts on the historic landscape (landfall and onshore cable).	It is considered unlikely that the Operation and Maintenance of the landfall/onshore cable route and communications station will lead to any impacts on the character of the overall historic landscape. Therefore, subject to consultation with CADW and the archaeological advisors to PCNPA, and feedback received on this Scoping Report, META intends to scope this impact out of further consideration within the EIA.
2	Impact on the setting of heritage assets.	It is considered unlikely that the Operation and Maintenance of the landfall/onshore cable route and communications station will lead to any impacts on the character of the overall historic landscape. Options 1-3, the cable is planned to be trenched into the sand and the temporary onshore control station will be hidden from public view. Option 4 is similarly set-back from the cliff top and therefore of minimal intrusion on public view.

Impact No.	Impact	Justification
		Therefore, subject to consultation with CADW and the archaeological advisors to PCNPA and feedback received on this Scoping Report, META intends to scope this impact out of further consideration within the EIA.
3	Impacts on buried archaeological remains (landfall, onshore cable and temporary onshore control station).	It is considered unlikely that the decommissioning of the onshore project will lead to any further impacts on the character of the overall historic landscape. Any such impacts would have been assessed in the EIA already. Therefore, subject to consultation with CADW and the archaeological advisors to PCNPA and feedback received on this Scoping Report, META intends to scope this impact out of further consideration within the EIA.

Potential Cumulative Impacts

The potential for the following projects or activities will be considered within the Historic Environment EIA Study Area (the maximum adverse scenarios for each of the projects will be assessed) for each META site supporting Phase 2 activities:

- Other onshore cabling and infrastructure;
- Onshore energy generation projects; and
- Minerals extraction and aggregate projects.

META will monitor the status of identified and emerging projects throughout the pre-application phase and consider these within the assessment of cumulative impacts within the EIA as necessary.

6.12 Marine Archaeology

6.12.1 Introduction

This Section of the Scoping Report identifies marine archaeology resources of relevance to the proposed development and considers the potential impacts during the installation of META equipment, operational and maintenance, and decommissioning phases of the Project.

6.12.2 Study Area

The marine archaeology Study Area (see Figure 6-1) for the Project is defined as:

- The Waterway – defined as the area inclusive of the Waterway and extends 12 NM from St Govan's Head to Skomer Island.

6.12.3 Baseline Information

Baseline Studies

An initial desk-based review of literature and data sources to support this Scoping Report has highlighted the following data sources which provide coverage of the marine archaeology Study Area:

- Records of the UKHO wrecks and obstructions provided by SeaZone Ltd;
- Records held by the National Monuments Record of Wales (NMRW);
- CADW;

- Records held in the regional Historic Environment Record, held by the Dyfed Archaeological Trust; and
- Any relevant cartographic material or written sources held by the National Library of Wales and RCHAMW

Milford Haven Waterway Study Area

Unlike many such flooded valleys in Britain, the Waterway has not silted up due to its limited freshwater inflow and its orientation facing into the Gulf Stream current, which generates a high energy environment in the mouth of the Haven. The depth of water and character of the marine archaeology Study Area varies considerably throughout the Waterway, from shallow intertidal bays and coves to subtidal water in the central Waterway channel. The Waterway's main tidal channel is deep, with a typical depth of 20 m between the mouth and the Cleddau Bridge and a typical depth of 10 m upstream of the Cleddau Bridge at the confluence at Lawrenny Quay. The varying topography of the seafloor and its relationship with the adjacent coast had a direct relationship with the nature, density and character of the archaeological remains found on and under it

Submerged prehistoric archaeology

The prehistoric archaeological record of the British Isles covers the period from the earliest hominin occupation more than 780,000 BP to the Roman invasion of Britain in 43 AD. During this period, sea level fluctuations caused by three major glaciations (the Anglian, Wolstonian and the Devensian) have shaped the submerged prehistoric landscape within the marine archaeological Study Area. The Waterway was subjected to considerable changes through the result of ice ages, with meltwater further deepening existing river valleys and leaving behind the deep macro-tidal ria.

Maritime environment

The significance of the Waterway maritime heritage is recognised in its registration as a landscape of Outstanding Historic Importance in Wales. The deep and sheltered waters of drowned valley extend 30 km inland. This deep water sheltered anchorage has long been recognised and was used as a muster point for the Anglo-Norman invasion of Ireland, as an invasion landing place by Owain Glydwr and Henry Tudor, and as sheltered anchorage for the British Fleet in the 18th century (Dyfed Archaeological Trust,2008).

Two of the major Welsh towns/ports of the medieval and later periods, Haverfordwest and Pembroke, are located on the upper reaches of Waterway. Industrialisation during the late 17th century and 18th century brought fishing, coastal trading and small-scale boat-building that would have been undertaken from the numerous small creeks. Amongst the villages, only Dale and Angle, both situated on the mouth of the Waterway, had a strong maritime economy. By 1700, coal from pits at Land Shipping, Cresswell, Hook and Llangwm were the major export from the Waterway. Many small quays developed to serve this industry. Numerous limekilns along the shore are evidence of the increasing importance of coastal trade. By the late 18th century the need for a town close to deep-water anchorages to service large ships and provide a port for Irish trade led to the foundation of Milford Haven town. A few years later naval dockyards and the town of Pembroke Dock were established. The coming of the railways in the mid-19th century diminished coastal trade, but small ships continued to call at Haverfordwest, Pembroke and other quays into the 20th century, and both Milford Haven town and Neyland became important fishing ports (Dyfed Archaeological Trust, 2008).

Maritime archaeology

Maritime archaeological sites and materials can be defined as the physical remains of boats and ships that have been wrecked, sunk or have foundered; aircraft losses; historical human structures (such as settlements) and artefacts which rest upon the seabed as the result of being jettisoned or lost overboard (for example, anchors, cannon or fishing gear).

Records of known wreck sites and losses in UK waters are biased towards the recent, predominantly post-medieval and modern periods, through the survival of associated historic sources. Although the existence and survival of Palaeolithic watercraft are highly speculative in the UK, Bronze and Iron Age sea-going vessels are likely to have been lost in the marine archaeology Study Area. The precise location of most wrecks in UK waters is not known. The majority of known and recorded wreck sites lie relatively close to the coast.

Data for known shipwrecks and recorded shipping losses within the marine archaeology Study Area were obtained from SeaZone and Cadw (see Figure 6-18). These datasets provide a general picture of maritime casualties in the marine archaeology Study Area but should not be viewed as representing the totality of the potential maritime archaeological remains in the area. Wrecks and obstructions listed by SeaZone are generally charted, although a small number lack accurate positional information.

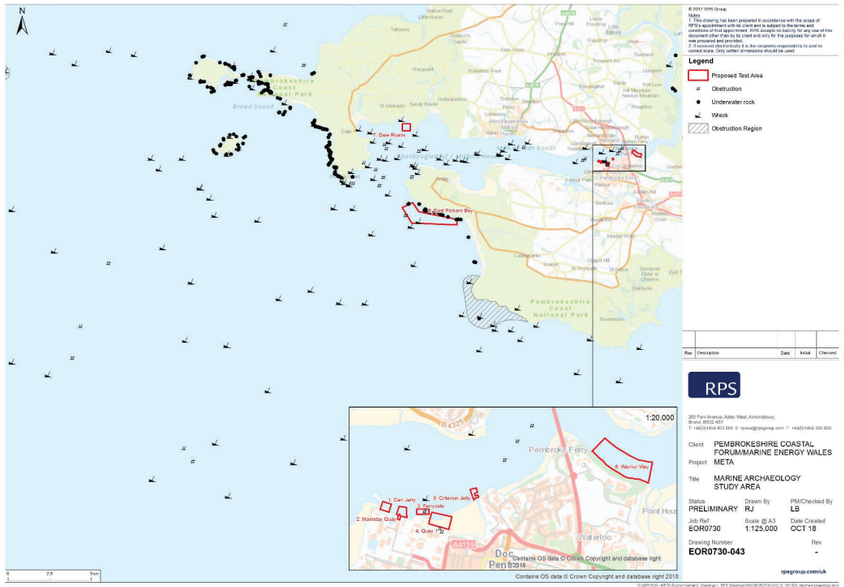

Figure 6-18: Marine Archaeology in the Milford Haven Waterway

Warrior Way (site 6)

A review of marine archaeological data has returned no known sites within Warrior Way (site 6). There is a beacon present on site, however this is not expected to be of archaeological importance.

Dale Roads (site 7)

Following a review of the marine archaeological data (Historic Wales National Museum Archaeology Collection) on historic wales, two prehistoric artefacts have been returned. The artefacts were found within the south westerly region of the site and may lie outside the Dale Roads boundary (location not determined/ inaccurate). A prehistoric chert blade and flint core rejuvenation blade have been collected from the site and added to the national museum archaeology collection. The proximity of these artefacts suggests that there is a potential for the presence of prehistoric material within this site.

East Pickard Bay (site 8)

An unnamed wreck can be found within the site boundary. The wreck lies orientated north-south with the bows to the north and has a length of 70 m and width of 10 m. It stands 3 m above the general level of the seabed and was first located in July 2006 (Coflein, 2009).

Another wreck can be found to the south west, just outside of the site (Figure 6-18). This wreck (name: LCG 15) is reported to lie upside down and has a Protection of Military Remains Act (1986) in place (Coflein, 2013). This Act makes it an offence to interfere with the wreckage of any designated vessel without a licence. The LCG 15 was a large flat-bottomed landing craft of 627 tons, modified to act as a gun platform for 4.7-inch guns, and intended to be used in the invasion of Sicily. The craft sank whilst in transit due to heavy sea conditions with the loss of all on board on 25th April 1943.

There are two recorded wrecks present within the intertidal region of Freshwater West Bay (where the cable will make landfall). The Willemoes was a wooden schooner built by J Ringanderson at Svenbourg in 1911. Technical and configuration specifications are given as 186 gt, 157 nt; 108ft length x 26ft 5in breadth x 10ft 8in depth and present upside down and buried but is occasionally uncovered (Clofein, 2015). The second wreck remains were uncovered during the storms of December 2013/January 2014. The inverted remains of a wooden vessel comprising a length of keel, outer planking fastened with iron pins, together with main and filling frames were uncovered on the beach. The beach had dropped and scoured around the remains to expose some 15.5 m x 3.4 m of the wreck (Clofein, 2015). There are no reported wrecks in the subtidal region along the proposed cable route.

6.12.4 Proposed Approach to the EIA

The EIA will consider the potential effects the installation, operational and decommissioning phases of the Project on historic assets within the Marine Archaeology Study Area. The impact assessment will consider both direct and indirect potential impact and will be assessed based on the nature of the proposed activities.

Baseline Studies

The ES Chapter will review the legislative, policy and guidance framework relevant to Marine Archaeology and will also set out an appropriate methodology for the assessment of impacts and effects on the historic environment.

The significance of potential impacts will be assessed by taking into account the potential magnitude of impacts (e.g. a high magnitude impact could involve the total loss of a heritage asset) and the sensitivity of heritage assets.

Assessment of Effects

The assessment of the likely effects on the historic environment will include the following activities:

- Identification of all heritage assets that could be affected by the proposed development, along with provision of a description of the significance (importance) of those assets including the contribution made by their setting;
- Identification of the likely effects of the proposed development on heritage assets within the site and an appropriate Study Area centred on it; and
- Assessment of significance of effects, taking into account measures proposed to avoid, reduce or offset adverse effects.

Assessment will be in the form of a matrix-based approach that examines the importance or value of the heritage asset against the magnitude of impact on that asset, leading to an identified significance of effect. This approach will be underpinned by a suitable narrative that explains how the importance or value of the asset has been appraised and how the magnitude of impact has been assessed.

The potential impact of the META Project on the Waterway LOHI may need to be considered through a formal Assessment of the Significance of the Impact of Development on Historic Landscape Areas on the Register of Landscapes of Historic Interest in Wales, in accordance with the guidance provided in the 2nd edition of the Guide to Good Practice on using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process – usually referred to as the 'ASIDOHL2' process. This will only be required if the scheme will have a 'more than local' impact on the registered historic landscape, and the need for it will be determined through consultation with CADW and the RCAHMW.

The impacts that have been scoped into the META Project assessment are outlined in Table 6-27 together with a description of any additional data collection that will be required to enable a full assessment of the impacts.

Table 6-27: Impacts to be assessed in the Marine Archaeology EIA

Impact No.	Impact	Justification	Proposed approach
Installation and Decommissioning			
1	Removal or disturbance of sediments.	There is potential for removal or disturbance of sediments due to installation or decommissioning of the communications cable and marine renewable devices resulting in a potential effect on near-surface and deeply buried prehistoric land surfaces.	The baseline will be supported with publicly available marine archaeological data and consultation with CADW, RCAHMW and the local welsh archaeological trust (Dyfed Archaeological Trust). The consultation and publicly available data will provide a robust evidence base with which to characterise the baseline physical environment at the landfall and enable potential impacts to be assessed.
2	Removal or disturbance of sediments.	There is potential for removal or disturbance of sediments due to installation or decommissioning of the communications cable and marine renewable devices resulting in a potential effect on shipwrecks.	As above for marine archaeology impact no. 1.

Impact No.	Impact	Justification	Proposed approach
3	Sediment deposition on the seabed.	There is potential for sediment deposition due to installation or decommissioning of the communications cable and marine renewable devices resulting in a potential effect on a variety of heritage assets.	As above for marine archaeology impact no. 1.
Operation Maintenance			
4	Removal or disturbance of sediments.	Maintenance activities including the deployment of vessel moorings, may affect a variety of heritage assets through the removal or disturbance of sediments.	As above for marine archaeology impact no. 1.

Potential Cumulative Impacts

The potential for the following projects or activities will be considered within the Marine Archaeology EIA Study Area (the maximum adverse scenarios for each of the projects will be assessed) for each META site supporting Phase 2 activities:

- Oil and gas infrastructure/development (cables and pipelines);
- Other cables (i.e. telecommunications and interconnectors);
- Commercial fishing activity;
- Navigation and shipping;
- Aggregate extraction and disposal of dredging spoil; and
- Beach replenishment schemes.

The CIA will consider the same impacts across all phases of the project as outlined in the Assessment of Effects Section above.

6.13 Landscape, Seascape and Visual Impact Assessment

6.13.1 Introduction

The Landscape, Seascape and Visual Impact Assessment (LSVIA) will identify and assess potential effects from the proposed Project on landscape resources and visual receptors, as well as the setting of historic landscapes and monuments, with reference to established methodology and guidance.

6.13.2 Study Area

As per the guidelines stated in the Guidelines for Landscape and Visual Impact Assessment (GLVIA3), the Study Area for the assessment will extend to a radial distance of 5 km from the META Project itself (Figure 6-19).

The seascape and visual resources will consider all receptors seaward of MLWS. Receptors landward of MLWS, including those receptors that are able to view offshore components of the META Project (such as cable laying during the installation phase) will be considered in the landscape and visual resources assessment Section 6.13.

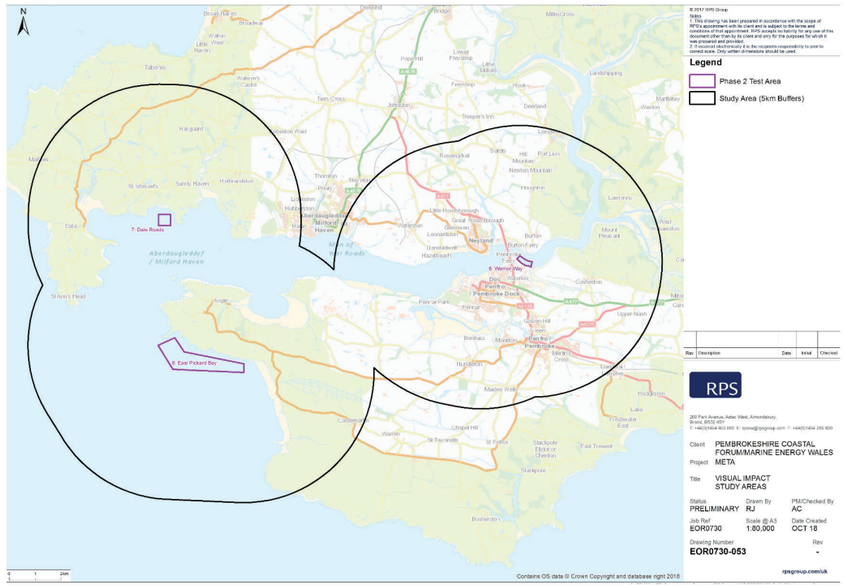

Figure 6-19: Landscape, Seascape and Visual Impact Study Area with 5 km Buffer

6.13.3 Baseline Information

Baseline data will be compiled via a combination of desktop study and onsite survey work, which will identify the key landscape features within and adjacent to the site boundary that form the landscape character and landscape baseline. The site work will also identify the visual baseline through location and analysis of the key public viewpoints and the likely effect of the proposed development of each view identified. No sea-based viewpoints are proposed.

Baseline Studies

The following desktop sources will be used to support the baseline characterisation:

- Guidelines for Landscape and Visual Impact Assessment, Third Edition Landscape Institute and the IEMA GLVIA3 (2013);
- GLVIA3 Statement of Clarification 1/13;
- An Approach to Landscape Character Assessment, Natural England (2014);
- Pembroke Dock Conservation Area Character Appraisal and Management Plan, Pembroke County Council (2017);
- LDP, Pembroke County Council (2013);
- Heritage Assessment, Turley Heritage (2016);
- Photography and Photomontage in Landscape and Visual Impact Assessment Advice Note 01/11, Landscape Institute (2011);
- LANDMAP Methodology "Visual and Sensory" Natural Resources Wales (2016);
- Guidelines for Landscape and Visual Impact Assessment, second edition, Landscape Institute and Institute of Environmental Assessment, 2002;
- Landscape Character Assessment, Guidance for England, Scotland and Wales (consultation draft), LUC, Natural England, Scottish Natural Heritage and Countryside Council for Wales, 2011;
- Pembrokeshire Coast National Park Coast Seascape Character Assessment, LDA, PCNPA, 2013;
- An approach to Seascape Character Assessment, (NECR105), Natural England, Scottish Natural Heritage and Countryside Council for Wales, 2012; and
- Seascape Characterisation around the English Coast (Marine Plan Areas 3 and 4 and Part of Area 6 Pilot Study) (NECR106), Natural England, 2012.

Milford Haven Waterway Study Area

Warrior Way and Dale Road are located outside the Pembrokeshire Coast National Park (PCNP), with East Pickard Bay located within the PNCP. It is a landscape of gently undulating pastoral fields, and the coast itself has a variety of landscapes formed either of the red sandstone, or limestone. The Port is however within the Pembroke Dock Conservation Area and the Waterway Landscape of Outstanding Historic Interest ('LOHI').

Warrior Way, Dale Roads and the western extent of East Pickard Bay are located within the Marine Character Area (MCA) 21: Milford Haven (MCA, 2015). This MCA has been designated for the drowned ria, important natural harbour with mudflats, inlets, marshes, creeks and bays. Strong Currents and swell can be found at the mouth of the estuary creating a popular recreation and sailing destination. The area is home to busy ports, commercial shipping and oil refineries.

The western extent of East Pickard Bay located within the MCA 22: South Pembrokeshire Coastal and Inshore Waters (MCA, 2015). The MCA has been designated for its internationally importance and diverse coastline, designated SACs and rich archaeological heritage.

Warrior Way (site 6)

Seascape

Warrior Way lies on the boundary of two seascape character areas: Inner Milford Haven (no. 32) (Pembrokeshire Coast National Park Seascape Character Assessment (PCNPSCA) 32, 2013), to the west and the Daugleddau (no.33) (PCNPSCA 33, 2013), to the east.

The key sensitive receptors of Inner Milford Haven (no. 32) seascape are:

- Recreation areas, places of worship, listed buildings and schedule ancient monuments and other historical features such as key views from Pembroke Castle;
- Noted viewing points, such as from the Cleddau Bridge, across the Daugleddau and other publicly accessible coastal viewpoints;
- Private residential properties with views of the proposed development;
- Pembrokeshire Coast Path and other public rights of way; and
- Large numbers of passing traffic on public roads.

The Daugleddau area comprises of the eastern and western Cleddau rivers which form a confluence at the start of the Daugleddau estuary, flowing south into the Waterway. The rivers harbours small scale commercial enterprises found in remnant quays. The area can be described as a peaceful, enclosed and intimate landscape with channelled vistas. The only factor detracting from the Daugleddau area is the presence of marine recreational activity.

The key sensitive receptors of Daugleddau (no.33) seascape are:

- Remote, unspoilt and tranquil nature of the tidal river system and landscape mosaic.
- Long channelled rural views;
- Historic features and character of castles, mills, wharves, forts and parks, gardens, and cultural associations;
- Nature conservation value of estuary and shoreline;
- Extensive and distinctive woodland cover; and
- Designation of Milford Haven Waterway Registered Landscape of Outstanding Historic Interest in Wales.

Landscape

No onshore development has been proposed at the Warrior Way site, therefore no assessment of landscape or visual impact will be required.

Dale Roads (site 7)

Seascape

Dale Roads lies within the seascape character area: Outer Milford Haven (no. 31) (Pembrokeshire Coast National Park Seascape Character Assessment 31 (PCNPSCA), 2013). This area forms the outer part of the Waterway, the mouth of the Waterway has an exposed open sea aspect with strong tides and currents contrasting with the sheltered bay of Dale.

Due to the industry present in the Waterway, such as the commercial shipping, refineries and other industrial uses; the presence of established recreational activity and lighting associated with settlements, shipping and industry can detract from the sensitivity of the area.

The key sensitive receptors of Freshwater West (no. 34) seascape are:

- Remote, unspoilt cliffs and sheltered bays and estuaries;
- Popular recreational destinations such as Dale;
- Nature conservation interest especially around Dale;
- Richness of military and nautical history; and
- Pembrokeshire Coast Path as a sensitive receptor.

Landscape

No onshore development has been proposed at the Dale Roads site, therefore no landscape character assessment will be required.

East Pickard Bay (site 8)

Seascape

East Pickard Bay lies within the seascape character area: Freshwater West (no. 34) (PCNPSCA 34, 2013).

Freshwater West (no. 34) is known for large waves and strong dangerous currents. As a result, there is low key, recreational use of beaches primarily used by tourists and experienced watercraft users. Some leisure boating and ship anchorage occurs but is restricted by the Castle Martin MOD firing range. There are no settlements in the immediate vicinity, there is a disused airfield present. These factors can detract from the sensitivity of the area.

The key sensitive receptors of Freshwater West (no. 34) seascape are:

- Remote, unspoilt sweep of beaches and dune systems with craggy cliffs;
- Wide views across bay and to focal points such as St Ann's Head;
- Tranquillity when no firing on ranges;
- Important recreational destination; and
- Pembrokeshire Coast Path as a sensitive receptor.

Landscape

The onshore elements of the META project at East Pickard Bay lie within the Pembrokeshire Coast National Park landscape character area: Freshwater West/ Brownslade Burrows (no. 8). The area can be described as rolling lowland, almost devoid of settlement, with associated coastal areas of fixed sand dunes, low sea cliffs, bays and a distinctive gently undulating open area dominated by sand dunes backed by marshy fields at the western end of Castlemartin Corse.

The key sensitive receptors of Freshwater West/ Brownslade Burrows (no. 8) landscape are:

- To retain and conserve the sense of remoteness;
- Ensure that the area is not spoilt by accumulations of flotsam and jetsam;
- Protect the natural sand dune succession with marram grass communities to the rear of the Burrows by managing footpath use and avoiding any development which would disrupt this succession;
- Ensure that scrub/bracken spread are monitored and subject to appropriate control measures as necessary to prevent colonisation of dunes and coastal grassland;
- Ensure that drainage is not altered to detriment of semi-natural marshland communities on Castlemartin Corse, including integrated catchment management in collaboration with the National Trust; and

- Ensure that as far as possible ancient monuments and remains are not lost or damaged.

6.13.4 Proposed Approach to the EIA

The impact assessment will consider both direct and indirect potential impacts during the installation, operational and maintenance, and decommissioning phases of the META Project. They will be assessed conceptually, based on an understanding of the local landscape and seascape of the area, and the nature of the proposed activities.

Assessment of Effects

The Waterway is already the UK's largest energy port with a wide range of marine and other energy related facilities located within it. Consequently, commercial industrial vessels are already a very common element within both the wider seascape character and context of the Waterway.

The META project lies inside the PCNP and there are views from locations throughout the Waterway that may be affected by proposed activities. The impacts scoped into the LSVIA assessment are presented in Table 6-28.

Table 6-28: Impacts to be assessed in the landscape, seascape and visual impact EIA

Impact no.	Impact	Justification	Proposed approach
Installation and Decommissioning			
1	The change to the existing present-day seascape character through the introduction of new or uncharacteristic elements/features.	There is the potential for an increase in vessels density as a result of installation and decommissioning activities within the Study Area.	A desk-based study of vessel density will be carried out to inform the LSVIA baseline.
2	Potential change in the existing day-time visual scenario.	As above for LSVIA impact no. 1	As above for LSVIA impact no. 1
3	Impacts on seascape and landscape character areas.	The installation and decommissioning of the onshore elements of the Project could cause direct impacts upon various character areas.	A site visit and desk-based study will be used to inform the LSVIA baseline.
4	Visual impacts experienced by residents	The installation and decommissioning of the onshore elements of the Project could be visible to receptors within residential properties.	As above for LSVIA impact no. 3
5	Visual impacts experienced by receptors occupied in recreational pursuits other than those using public rights of way (PRoWs)	The installation and decommissioning of the onshore elements of the Project could be visible to visual receptors occupied in recreational pursuits other than those using PRoWs.	As above for LSVIA impact no. 3

Impact no.	Impact	Justification	Proposed approach
6	Visual impacts experienced by people at their place of work (e.g. commercial or business premises).	The installation of the onshore elements of the Project could be visible to a number of people at their place of work (e.g. in-situ or dynamic (i.e. Surfing instructors).	As above for LSVIA impact no. 3
Operation and Maintenance			
7	Interruption of existing visual scenario through the introduction of uncharacteristic elements/ features	Increased vessels usage required for operation of marine renewable devices at META sites within the Milford Haven Waterway Study Area may impact existing visual scenario.	As above for LSVIA impact no. 1
8	Impacts on seascape and landscape character areas.	The Operation and Maintenance of the temporary onshore control station and presence of marine devices, could cause direct impacts upon various character areas.	As above for LSVIA impact no. 3
9	Potential change in the existing night-time visual scenario.	Any navigation warning lights will be visible on any above water marine renewable devices.	As above for LSVIA impact no. 1
10	Visual impacts experienced by residents	The Operation and Maintenance of the temporary onshore control station and presence of marine devices could be visible to visual receptors within residential properties.	As above for LSVIA impact no. 3
11	Visual impacts experienced by receptors occupied in recreational pursuits other than those using public rights of way (PRoWs)	The Operation and Maintenance of the temporary onshore control station and presence of marine devices could be visible to receptors occupied in recreational pursuits other than those using PRoWs.	As above for LSVIA impact no. 3
12	Visual impacts experienced by people at their place of work (e.g. commercial or business premises).	The Operation and Maintenance of the temporary onshore control station and presence of marine devices could be visible to a number of people at their place of work (e.g. in-situ or dynamic (i.e. Surfing instructors).	As above for LSVIA impact no. 3

Knowledge of the baseline environment and the proposed activities have allowed impacts to be scoped out of the assessment, where there is considered to be no receptor-impact pathway (Table 6-29).

Table 6-29: Impacts proposed to be scoped out of the landscape and seascape visual EIA

Impact No.	Impact	Justification
1	Visual impacts offshore from the temporary onshore control station.	It is considered unlikely that there would be any offshore visual impact from the operation of the temporary onshore control station given its distance from the sea. Therefore, subject to consultation with statutory consultees and feedback received on this Scoping Report, MEW intends to scope this impact out of further consideration within the EIA.

Potential Cumulative Impacts

The potential for the following projects or activities will be considered within the LSVIA EIA Study Area (the maximum adverse scenarios for each of the projects will be assessed) for each META site supporting Phase 2 activities:

- Other marine developments and associated cabling and infrastructure;
- Oil and gas infrastructure/development (cables and pipelines);
- Other cables (i.e. telecommunications and interconnectors);
- Commercial fishing activity;
- Navigation and shipping; and
- Aggregate extraction and disposal of dredging spoil.

The CIA will consider the same impacts across all phases of the project as outlined in the Assessment of Effects Section above.

6.14 Socio-economic and Tourism

6.14.1 Introduction

This Section of the Scoping Report identifies sources of information that will help define the baseline socio-economic environment and the potential impacts and likely significant effects on identified socio-economics receptors arising from the installation, Operation and Maintenance, and decommissioning of the META project.

6.14.2 Study Area

The selection of Study Areas for the socio-economic impact analysis will take account of the spatial scale at which impacts upon different receptors are likely to occur. This is likely to vary across receptors.

6.14.3 Baseline Information

Pembrokeshire county has a population of 122, 439 residents (Office of National Statistics (ONS, Census 2011)), this equates to 17.9% of the Swansea Bay City Region population. The population of Pembrokeshire rose strongly over the period 2001-11 but has experienced a slower rate of growth between 2011-16 (ONS, Population Mid-Year Estimates).

Pembrokeshire supports 88,049 jobs (ONS, BRES 2016), this equates to 29.2% of jobs in the Swansea Bay City Region. Employment in the locality has been broadly static in recent years in comparison to rising employment across comparator areas (ONS, BRES 2016).

The economic activity rate, employment rate and unemployment rate in Pembrokeshire are similar to the Welsh average. However, all compare unfavourably with the Great Britain average (ONS, Annual Population Survey).

Wages earned by working residents of Pembrokeshire are well below Wales and Great Britain averages. This is also true when considering the workplace-based measure of earnings.

Pembrokeshire earnings are approximately 90% of the Wales average and 80% of the Great Britain average (ONS, Annual Survey of Hours and Earnings).

There is a lower proportion of working age residents with the highest level of qualifications in Pembrokeshire, in comparison to Wales and Great Britain (ONS, Annual Population Survey). The Pembroke area comprises some of the most deprived communities within Pembrokeshire with a number of Lower Super Output Areas (LSOAs) in the 10% most deprived in Wales (Welsh Government, Welsh Index of Multiple Deprivation).

Tourism and Recreation Receptors

It is reasonable to expect potential impacts of onshore and offshore infrastructure on tourism and recreation activity to materialise in a localised impact area which reflects the location of individual or groups of tourism and recreation receptors. The scale of this impact area will be informed by findings of analysis underpinning other Chapters of the ES, namely:

- Commercial Fisheries (Chapter 6.9)
- Landscape, seascape and visual resources (Chapter 6.13); and
- Other users (Chapter 6.15).

Effects on tourism and recreation are likely to be largely focused on the PCC and PCNPA. These local authorities will form the provisional Local Impact Area for tourism and recreation related receptors, although this might need to be extended to include other neighbouring authorities, should the EIA undertaken for other Chapters of the ES indicate that recreational and tourism effects could be more widespread.

The total number of visitors to Pembrokeshire per annum amounts to 4,225,700, of which 1,911,100 are day visitors. With a total visitor spend of £569,940,000 per annum, of which £349,200,00 is directly spent on accommodation, attractions and activities. This creates a total of 14,180 full time jobs to directly support the tourism industry in Pembrokeshire county, and another 2,085 indirectly supporting the industry (Pembrokeshire Tourism Industry, 2012).

6.14.4 Proposed Approach to EIA

There is no specific guidance for assessing the impact of marine renewable projects on socio-economics.

The assessment will consider the likely significant effects associated with both onshore and offshore infrastructure:

- The assessment of effects associated with offshore infrastructure, will consider the onshore and offshore receptors. For instance, in relation to tourism activity, the assessment will consider the effect on both onshore and offshore recreational activities; and
- The assessment of effects associated with onshore infrastructure is limited to onshore receptors.

The absolute scale of economic impacts (i.e. the number of jobs which installation, Operation and Maintenance, and decommissioning activity is expected to support) will be calculated using an approach consistent with methods for economic impact assessment set out in HM Treasury Green Book (HM Treasury, 2018). The socio-economic impact magnitude will be determined by consideration of the predicted deviation from baseline conditions.

Magnitude of impact and sensitivity of receptor will be combined to determine the overall significance of effect. These can be either adverse or beneficial, depending on the receptor being assessed.

Baseline Studies

The key sources of data used to assess the baseline environment include relevant national datasets from the Office for National Statistics (ONS) providing intelligence on population, labour market and employment base conditions. The analysis will draw on the most up to date sources of data available for all key socio-economic indicators.

The socio-economic baseline assessment will cover:

- Population;
- Employment and economic activity;
- Industry;
- Income and wealth;
- Transport and commuting; and
- Tourism and leisure.

The key socio-economic and tourism topics which will be covered by the baseline assessment, the measures used to assess the topics and the data sources which will be used are outlined in Table 6-30.

Table 6-30: Socio-economic and tourism baseline measures and data source

Measure	Topic	Source
Population	Population	ONS Mid-year population estimates
	Populations structure: • Sex; • Age; and • Working age.	ONS Mid-year population estimates
	Dependency Rations	ONS Mid-year population estimates
	Changes over time	ONS Mid-year population estimates
	Population projections	ONS Sub-national population projections
Industry	Sectoral and size band structure of the business base: change over time	ONS Business Demography
	Sectoral and size band structure of the employment base: • Change over time; and • Location quotients.	Business Register
	Major employers	Existing baseline studies
	Enterprise 'birth' and 'death' rates	ONS Business demography
	Business survival rates	ONS Business demography

Measure	Topic	Source
	Trends in GVA of main industrial sectors	ONS Regional GVA estimates
Employment and economic activity	Economic activity: • Economically active – FT, PT, self- employment; and • Economically inactive.	Annual Population Survey
	Occupational breakdown	Annual Population Survey
Income and Wealth	Workplace and residence-based earnings	Annual Survey of Hours and Earnings
	Gross Value Added (GVA) per employee	Online National Statistics/ Welsh Annual Business Statistics
Transport and commuting	Commuting and travel patterns	Desk research (to be identified as study progresses) 2011 Census
Tourism and leisure	Review of existing attractions Tourist numbers. Volume and Value of tourism activity.	Pembrokeshire Tourism Help website; Desk study (to be identified as study progresses).

Assessment of Effects

The potential Socio-economic and tourism impacts which have been scoped into the assessment are outlined in Table 6-31 below, together with a description of any additional data collection and/or supporting analyses that will be required to enable a full assessment of the impacts.

It is not proposed that any socio-economic impacts are scoped out of the assessment.

Table 6-31: Impacts to be assessed in the Socio-Economic EIA

Impact No.	Impact	Justification	Proposed approach
Installation and Decommissioning			
1	Impact on installation - related employment in the supply chain.	There is potential for expenditure on the installation and decommissioning of the Project to support employment in companies in the Pembrokeshire areas that are directly engaged in the META supply chain. The installation and decommissioning of the Project could also go on to support employment indirectly in the wider supply chain (i.e. amongst	Desk based analysis of baseline employment conditions in sectors related to the construction/installation of marine renewable test sites and devices. This will draw predominantly on publicly available datasets.

Impact No.	Impact	Justification	Proposed approach
		the companies that supply goods and services to firms directly engaged in the upper tiers of the META supply chain).	
2	Impact on the amount of Gross Value Added (GVA) supported by installation/decommissioning activity.	As for Impact 1	As for Impact 1
3	Impact on access to installation or decommissioning-related employment amongst local residents.	The direct and indirect employment associated with the installation or decommissioning of the Project could increase the range and supply of employment opportunities that are accessible to residents of Pembrokeshire.	Desk based analysis of current labour market capacity and the existence of appropriately skilled residents in local impact areas.
4	Impact on the demand for housing, accommodation and local services.	Direct and indirect employment generated during the installation phase could increase demand for housing, accommodation and local services during the installation and decommissioning phases.	Consultation with relevant local authority officers to ascertain current conditions and capacity in the supply of housing, accommodation and local services.
5	Impact on the performance of the renewable energy sector.	Any additional economic activity associated with the installation of META could support the creation of wider catalytic benefits for the renewable energy sector that could be sustained after the installation and phase is complete.	Analysis of the current conditions in the renewable energy sector in the Pembrokeshire area will be based on a combination of desk-based research (drawing on published datasets) and consultation with relevant economic development officers locally, to understand the performance of the sector locally.
6	Impact on offshore and coastal tourism and	Potential effects on tourism and recreation	The nature, volume and economic value of

Impact No.	Impact	Justification	Proposed approach
	recreation activity and associated economic value.	could be created by visual, noise and vibration impacts associated with installation and decommissioning of offshore and onshore infrastructure. Any disruption of onshore or offshore recreational activities occurring as a result of installation activities could also have an effect on the level and nature of tourism and recreation activity locally.	coastal tourism and recreation activity will be assessed drawing on published datasets and analysis.
7	Impact on local tourism and recreational resources.	The installation and decommissioning of the Project could lead to disruption of local tourism and recreational resources (e.g. as a result of the installation of onshore cabling or the temporary onshore control station).	The baseline for this receptor will be established in Chapter 6.15: Other Users.
Operation and Maintenance			
8	Impact on employment in Operation and Maintenance in the supply chain	There is potential for the direct employment created by the Operation and Maintenance of META to increase employment in the area. The supply chain expenditure on the Operation and Maintenance of META also has potential to support employment in Welsh and UK companies that are directly engaged in the META Operation and Maintenance supply chain. The Operation and Maintenance of META could also go on to support employment indirectly in the wider supply chain (i.e. amongst the companies that supply goods and services to firms directly engaged in	Desk based analysis of baseline employment conditions in sectors related to the Operation and Maintenance of marine renewable test sites and devices. This will draw predominantly on publicly available datasets.

Impact No.	Impact	Justification	Proposed approach
		the upper tiers of the META supply chain).	
9	Impact on the amount of GVA supported by Operation and Maintenance activity.	There is potential for the direct employment created by the Operation and Maintenance of META to increase GVA in the Pembrokeshire area. The Operation and Maintenance of META could also go on to support GVA indirectly in the wider supply chain (i.e. amongst the companies that supply goods and services to firms directly engaged in the upper tiers of the META supply chain).	Desk based analysis of baseline employment conditions in sectors related to the Operation and Maintenance of marine renewable test sites and devices. This will draw predominantly on publicly available datasets.
10	Impact on access to Operation and Maintenance related employment amongst residents.	The direct and indirect employment associated with the Operation and Maintenance of META could increase the range and supply of employment opportunities that are accessible to residents of the area.	Desk based analysis of current labour market capacity and the existence of appropriately skilled residents in local impact areas.
11	Impact on demand for housing, accommodation and local services.	Direct and indirect employment generated during the Operation and Maintenance phase could increase demand for housing, accommodation and local services.	Consultation with relevant local authority officers to ascertain current conditions and capacity in the supply of housing, accommodation and local services.
12	Impact on the performance of the renewable energy sector.	Any additional economic activity associated with the Operation and Maintenance of META could support the creation of wider catalytic benefits for the renewable energy sector.	Analysis of the current conditions in the renewable energy sector in the area will be based on a combination of desk-based research (drawing on published datasets) and consultation with relevant economic development officers

Impact No.	Impact	Justification	Proposed approach
			locally to understand the performance of the sector locally.
13	Impact on offshore and coastal tourism and recreation activity and associated economic value.	Potential effects on tourism and recreation could be created by visual, noise and vibration impacts associated with Operation and Maintenance of offshore and onshore infrastructure. Any disruption of onshore or offshore recreational activates occurring as a result of Operation and Maintenance could also have an effect on the level and nature of tourism and recreation activity locally.	The nature, volume and economic value of coastal tourism and recreation activity will be assessed drawing on published datasets and analysis.
14	Impact on local tourism and recreational resources.	The Operation and Maintenance of META could lead to disruption of local tourism and recreational resources (e.g. as a result of the Operation and Maintenance of onshore cabling or communications station).	The baseline for this receptor will be established in Chapter 6.15: Other Users.

Potential Cumulative Impacts

The potential for the following projects or activities will be considered within the Socio-economic and tourism EIA Study Area (the maximum adverse scenarios for each of the projects will be assessed) for each META site supporting Phase 2 activities:

- Other offshore developments and associated onshore cabling and infrastructure;
- Onshore energy generation projects (excluding householder scale projects);
- Major residential, commercial and leisure projects; and
- Minerals extraction and landfill projects.

6.15 Other Users

6.15.1 Introduction

This Chapter will consider the effects of the installation, operational and decommissioning phases of the META Project on recreational activities within the Study Area.

6.15.2 Study Area

The Study Area will comprise the Milford Haven Inner and Outer Waterbodies, and the Pembrokeshire South Coastal Waterbody as defined by the Water Framework Directive; and the three localised META sites of Warrior Way, Dale Roads and East Pickard Bay (Figure 6-20).

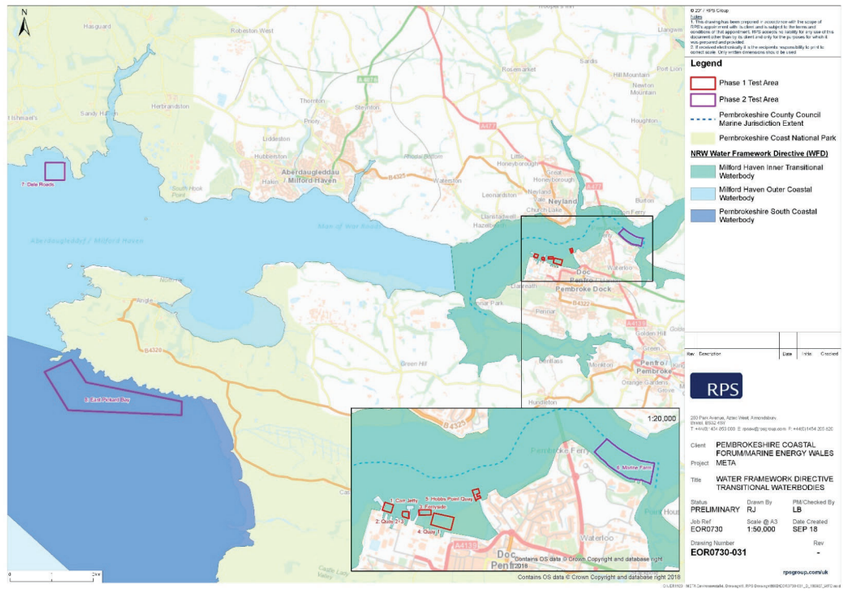

Figure 6-20: Other Users Study Area

6.15.3 Baseline Information

The coastal regions of the Study Area support a wide array of recreational activities. Popular countryside activities include walking, fishing, horse riding, paddleboarding, power boating and sailing (Figure 6-21). The region is also popular for adventure sports such as coasteering, surfing, climbing, abseiling and sky diving.

Warrior Way

Activities in and around this site include:

- Dinghy sailing;
- Jet ski;
- Jet ski route;
- Wildlife boat trip route;
- Kayaking;
- Paddleboarding; and
- Rowing.

Dale Roads

Activities in and around this site include:

- Sea angling;
- Diving;
- Paddleboarding; and
- Rowing.

East Pickard Bay

Activities in and around this site include:

- Diving;
- MOD firing range (Castlemartin);
- Power boating;
- Bathing;
- Sea angling;
- Kayaking;
- Hiking
- Paddleboarding; and
- Surfing.

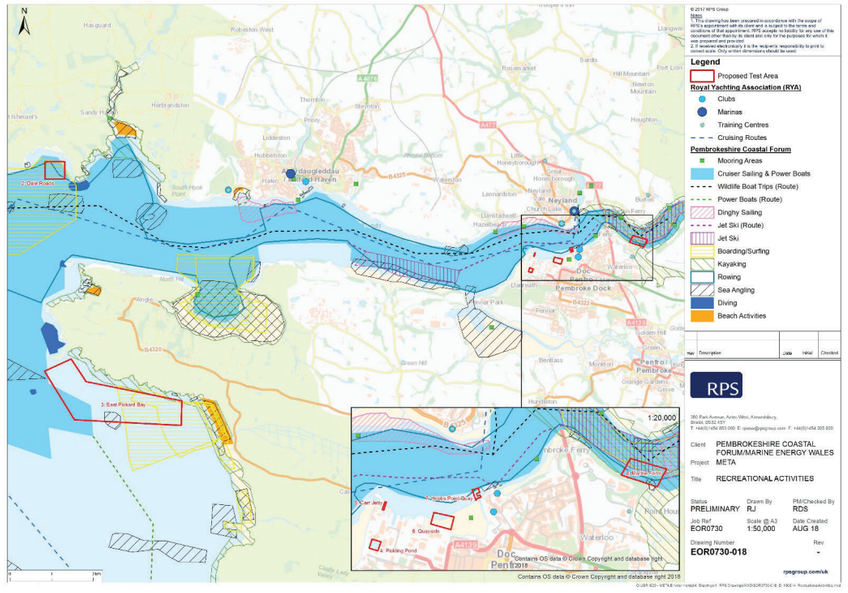

Figure 6-21: Recreational Activities in the Study Area

An extensive network of footpath and bridleways line the coastline of Pembrokeshire. National and regional routes include the Pembrokeshire Coast Path National Trail and the Wales Coast Path. In particular, the installation of onshore cabling and temporary onshore control station at Freshwater West Bay may cross the Pembrokeshire Coast Path and a public bridleway depending on confirmation of final onshore cabling route within the cable corridor search area, and final confirmation of the temporary onshore control station location (Figure 6-22).

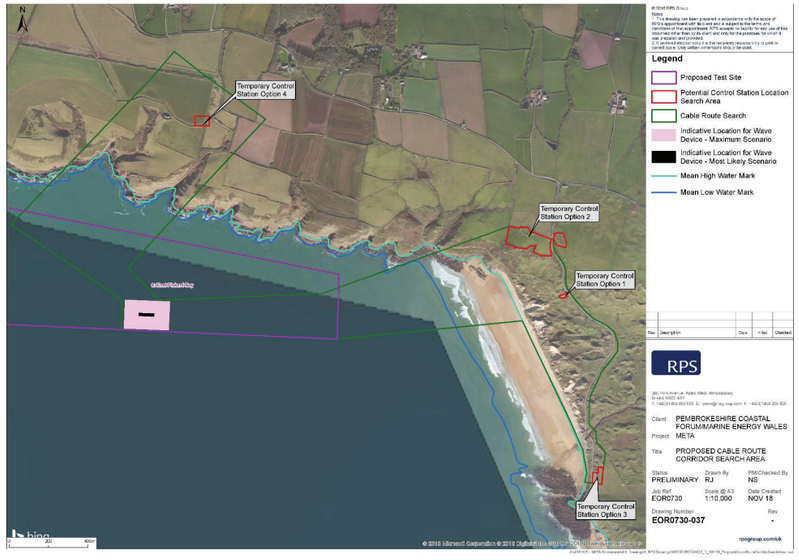

Figure 6-22: Onshore META Infrastructure and Cable Route Options

6.15.4 Proposed Approach to EIA

The approach will consider the effect of installation, operation and decommissioning phases of the META project, on recreational receptors. This will include reference to the Navigation and Shipping (Chapter 6.7) assessment and the Landscape and Visual Impact (Chapter 6.9) assessment.

Baseline Studies

A desk-based study of the recreational amenity value of the Study Area will be informed by a review of other industries and infrastructure within the Study Area. Data sources which will inform the assessment include:

- Wales Marine Planning Portal;
- A report on the Economic Activity dependent on the Waterway undertaken by Cardiff University (2012));
- Relevant guidance documents such as TAN 16: Sport, recreation and Open Space (2009);
- The relevant WFD Assessment (water quality) with particular reference to bathing waters at Freshwater Bay; and
- The RYA UK Coastal Atlas of Recreational Boating.

Assessment of Effects

Consultation will be undertaken in conjunction with the local community and other interest groups, as well as consultation on future plans for recreation in the area. The identification of potential effects upon recreational activities in the Study Area and the level of impact on these recreational activities will be assessed. The following are considered to be the main potential effects that will be assessed:

- Reduced sea area within the META Project area to support recreational activities due to the installation, Operation and Maintenance, and decommissioning of the Project; and
- Increased risk of collision to other sea users with devices or associated infrastructure due to the installation, Operation and Maintenance, and decommissioning the META Project.

No potential impacts have been scoped out of further assessment. The assessment will consider potential changes to recreational sea users route options and overall area available, compared to the existing baseline scenario.

Potential Cumulative Impacts

The MOD firing range is located to the south of East Pickard Bay marine testing area therefore the MOD firing range will be considered in the cumulative impact assessment.

THE CIA will consider the same impacts across all phases of the project as outlined in the Assessment of Effects Section above.

6.16 Traffic and Transport

This chapter will provide an assessment of potential effects on transportation and traffic during the installation, operational and decommissioning phases of the META project.

6.16.1 Introduction

Current transport policies at the national and local level are built around the central themes of long-term sustainable development, sustained investment in transport and improved accessibility at all levels. These policies promote continued economic growth through the provision of an efficient and reliable transport system, a reduction in traffic congestion, improvements in highway safety, and enhancements to the accessibility of sustainable modes of travel.

It is considered that the META project complies with the relevant national and local land use and transport policies as:

- The development would have safe access to the highway network and would not cause traffic congestion or exacerbate existing traffic congestion; and
- It enables the supply of renewable energy through environmentally acceptable solutions.

6.16.2 Study Area

The extent of the study area to be considered will be agreed with PCNPA, and will include access to, and parking at Freshwater West Bay. For the purpose of this EIA Scoping Report, current national and local transport planning policy relevant to the proposed development has been reviewed, including:

- Wales Spatial Plan – People, Places, Futures (November 2004);
- Planning Policy Wales (Edition 9, November 2016);

6.16.3 Baseline Information

Warrior Way and Dale Roads

Warrior Way and Dale Roads have no onshore facilities and no direct access from the existing road network. Access to deploy test devices/sub-assemblies will be via the Waterway, and there will therefore be no direct impact on traffic or transport from installation, operation or decommissioning at these sites. Warrior Way and Dale Roads are therefore scoped out of further consideration under this topic.

East Pickard Bay

Onshore works to install communications facilities for the East Pickard Bay META site may have short-term impacts on parking, road accessibility and road crossings at Freshwater West Bay during the installation phase of the META project. The potential impacts of the proposed works on traffic and transportation for East Pickard Bay are therefore considered further.

The onshore works associated with testing at the East Pickard Bay META site is illustrated in Figure 2-4. It is considered that the site is accessible by walking, cycling and car, and the Pembrokeshire Coast and Wales Coast Walks both run through Freshwater west bay. There are parking facilities provided by the National Trust at both the north and south of Freshwater West Bay. Freshwater West Bay is serviced by the B4319.

Sensitive Receptors

Sensitive areas are defined by the presence of sensitive receptors. Within this assessment the potential effects have been considered as follows:

- On local roads and the users of these roads; and
- On land uses fronting these roads.

Sensitive receptors within the study area will be agreed with PCNPA prior to the assessment being carried out.

6.16.4 Proposed Approach to EIA

The scope of the Traffic and Transport Assessment (TTA) that forms the basis for this ES chapter will be agreed with PCNPA prior to the submission of the application and will be produced in line with national guidance.

Baseline Studies

The TTA assessment will be based on a desktop review of available data and will follow the approach outlined below:

- Review of national, regional and local policy;
- Audit of the existing transport conditions surrounding the application site;
- Description of the proposed development including means of access; and
- Prediction of the transport characteristics associated with the proposed development.

Approach to Assessment

The IMEA guidance suggests that the scale and extent of the assessment should be limited to traffic flow increases of 30% (10% if affecting a sensitive area). The guidelines state that projected changes in traffic of less than 10% creates no discernible environmental effect, given that daily variations in background traffic flow may fluctuate by this amount.

In terms of background traffic growth, it is considered unlikely that installation works for the temporary onshore control station or cable route will lead to a noticeable increase in traffic within the study area (i.e. less than 10%).

However, the ES chapter will consider the environmental effects in relation to traffic generation of the META project (specifically the onshore aspects of the East Pickard Bay META site), including considering the following:

- Setting out the assessment methodology to consider the effects of the proposed development on the surrounding transport network – specifically carparking, road closures and road crossings;
- The baseline conditions of the surrounding transport network;
- Assess the effects related to traffic generated by the development including the effect of the change in traffic flows, temporary road closures, car parking and temporary road crossings;
- Identify measures required to prevent, reduce or offset potential adverse effects; and
- Set out any residual effects after these measures have been implemented. The level of assessment may differ dependent on cable routing and temporary control station location option being considered, however the assessment will be adjusted according finalised for final option.

Potential Cumulative Impacts

The CIA will consider the same impacts across all phases of the project as outlined in the Assessment of Effects Section above.

7 Summary

7.1 Overview

This EIA Scoping Report has been prepared by RPS on behalf of MEW. It proposes the scope of EIA for Phase 2 of the META project in the Milford Haven.

META forms a key component of the Pembrokeshire Dock Marine Project and will facilitate the testing of marine renewable devices, allowing developers to de-risk the technology and operations before progressing onto larger scale or array developments.

A two-phased approach has been adopted for the META project with Phase 1 sites screened out of the requirement for an EIA (Section 2.3). Phase 2 sites have been screened into the requirement for an EIA and the assessment will be submitted as an ES in support of consent/licence applications. The proposed scope of the ES is detailed in this report.

This Scoping Report is intended to support engagement with regulatory bodies and their statutory consultees, inviting them to provide a scoping opinion on the proposed project, including an indication of likely significant effects on the environment that should be assessed further in the EIA. As such, this Scoping Report has identified the main aspects of the physical, biological and socio-economic environment likely to be affected by the installation, Operation and Maintenance, and decommissioning of the META Project. For each technical topic this Scoping Report has identified baseline data that will be used to support the EIA, the impacts scoped into and out of the assessment, and the approach that will be employed to assess impacts within the EIA. A summary of the potential impacts to be scoped in and out of the EIA is provided in Table 7-1 .

Table 7-1: Summary of Impacts Scoped in and out of the META Project EIA

Topic	Key: Scoped in / Scoped Out	
	Installation and Decommissioning	Operation and Maintenance
Coastal Processes	Increases in SSC and deposition of disturbed sediment to the seabed within Warrior Way (site 6), Dale Roads (site 7) and East Pickard Bay (site 8)	Impacts to the wave regime, with associated potential impacts along adjacent shorelines
	Impacts to international and nationally designated sites.	Impacts to international and nationally designated sites
	Impacts to hydrodynamics, sediment transport and beach morphology at communications cable landfall.	Scour of seabed sediments
	Increases in SSC and deposition of disturbed sediment on the seabed within the Milford Haven Waterway Study Area.	Impacts to sediment transport and sediment transport pathways
	Release of contamination adsorbed to sediments disturbed, on ecological receptors	
	Impact to superficial geology through cable installation/decommissioning	
	Potential impacts to "Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)" SAC interest	Potential impacts to "Submerged or partially submerged sea caves" SAC interest
	Potential impacts to "Submerged or partially submerged sea caves" SAC interest	Potential impacts to "Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)" SAC interest
Intertidal and Subtidal Benthic Ecology	Temporary disturbance to intertidal and subtidal habitats	Temporary disturbance to intertidal and subtidal habitats
	Effects of increases in SSCs and associated sediment deposition on intertidal and subtidal habitats	Effects of increases in SSCs and associated sediment deposition on intertidal and subtidal habitats
	Potential for resuspension of contaminated sediments with effects on benthic subtidal and intertidal receptors	Risk of introduction of INNS
	Risk of introduction of INNS	
	Effects of accidental release of pollutants (e.g. accidental spillage) on benthic species and habitats	Effects of accidental release of pollutants (e.g. accidental spillage) on benthic species and habitats

Topic	Key: Scoped in / Scoped Out	
	Installation and Decommissioning	Operation and Maintenance
Fish and Shellfish Ecology	Temporary habitat loss / disturbance	Medium-term habitat loss
	Effects of increases in SSCs and associated sediment deposition	
	Removal of hard structures	Colonisation of hard structures
	Temporary seabed disturbance	EMF
	Underwater noise	Underwater noise
Marine Mammals	Increased anthropogenic underwater noise – vessel noise	Collision risk – tidal turbines
	Increases in suspended sediment concentration (SSC)	Entanglement Risk
	Changes in fish and shellfish community	Increased anthropogenic underwater noise - vessels
	Increased collisions risk with vessels	Increases in suspended sediment concentration (SSC)
		Changes in fish and shellfish community
		Increased collisions risk with vessels
	Accidental Pollution	Accidental Pollution
		Electro-magnetic Field (EMF)
	Increased anthropogenic underwater noise – installation/decommissioning activities	Increased anthropogenic noise – tidal turbines during operational phase
	Eurasian otter at Pen Llyn a`r Sarnau / Lleyn Peninsula and the Sarnau SAC	Eurasian otter at Pen Llyn a`r Sarnau / Lleyn Peninsula and the Sarnau SAC
Marine Ornithology	Changes in fish and shellfish community	Changes in fish and shellfish community
	Increased noise - vessels	Increased noise - vessels
	Increased vessel collision risk	Increased vessel collision risk
	Accidental pollution	Accidental pollution
		Collision risk – tidal turbines
Onshore Ecology	Disturbance or damage to habitats/ species	Disturbance to species

Topic	Key: Scoped in / Scoped Out	
	Installation and Decommissioning	Operation and Maintenance
	Habitat fragmentation and severance	
	Temporary displacement of species (cable installation)	
	Habitat loss and disturbance/ displacement of species (control station)	
	Accidental pollution	Accidental pollution
Underwater Noise and Vibration	Underwater noise and vibration impacts will be assessed	Underwater noise and vibration impacts will be assessed
Onshore Noise and Vibration	Noise impacts from increased traffic	Noise impacts from increased traffic
	Noise impacts from installation/decommissioning of onshore infrastructure	Noise impacts from operation of temporary onshore control station and associated power generators
	Vibration impacts from installation /decommissioning of onshore infrastructure	
Commercial Fisheries	Interference with commercial and recreational fishing activity	Gear snagging within the East Pickard Bay area
	Displacement or disruption of commercially important fish and shellfish resources	Displacement or disruption of commercially important fish and shellfish resources
		Interference with fishing activity
	Reduction in access to, or exclusion from, established fishing grounds within the Waterway area	Reduction in access to, or exclusion from, established fishing grounds within the Waterway area
Shipping and Navigation	Reduction in navigable water depth for commercial, fishing, and recreational vessels.	Reduction in navigable water depth for commercial, fishing, and recreational vessels.
	Increased collision risk to vessels without captain including commercial vessels, recreational users and commercial fishing vessels in an emergency situation (including machinery related problems or navigational system errors)	Increased collision risk to vessels without captain including commercial vessels, recreational users and commercial fishing vessels in an emergency situation (including machinery related problems or navigational system errors)
		Increased vessel to structure collision risk for commercial vessels, recreational users and commercial fishing vessels

Topic	Key: Scoped in / Scoped Out	
	Installation and Decommissioning	Operation and Maintenance
		Potential deviations to commercial routes
		Increased risk of anchor snagging of commercial vessels and commercial fishing vessels (in transit)
	Diminished emergency response capability (including SAR) within the Waterway during installation	Diminished emergency response capability with Waterway (including SAR)
	Diminished pollution and salvage response capability for emergency responders	Diminished pollution and salvage response capability for emergency responders
	Increased collision risk for sea users transiting the area where the offshore communications cable is located at East Pickard Bay	EMF interference for vessels using magnetic compasses
Historic Environment	Direct impacts on heritage assets	Impacts on the historic landscape (landfall and onshore cable)
	Temporary impacts on the settings of heritage assets	Impact on the setting of heritage assets
	Temporary impacts on the historic landscape (landfall, onshore cable and temporary onshore control station)	Impacts on buried archaeological remains (landfall, onshore cable, onshore control station)
Marine Archaeology	Removal or disturbance of sediments – deeply buried prehistoric land surfaces	Removal or disturbance of sediments
	Removal or disturbance of sediments – shipwrecks	
	Sediment deposition on the seabed	
Landscape, Seascape and Visual impact	The change to the existing present-day seascape character through the introduction of new or uncharacteristic elements/features	Interruption of existing visual scenario through the introduction of uncharacteristic elements/ features
	Potential change in the existing day-time visual scenario	Impacts on seascape and landscape character areas
	Impacts on seascape and landscape character areas	Potential change in the existing night-time visual scenario
	Visual impacts experienced by residents	Visual impacts experienced by residents
	Visual impacts experienced by receptors occupied in recreational pursuits other than those using public rights of way (PRoWs)	Visual impacts experienced by receptors occupied in recreational pursuits other than those using public rights of way (PRoWs)

Topic	Key: Scoped in Scoped Out	
	Installation and Decommissioning	Operation and Maintenance
	Visual impacts experienced by people at their place of work (e.g. commercial or business premises)	Visual impacts experienced by people at their place of work (e.g. commercial or business premises)
		Visual impacts offshore from the temporary onshore control station.
Socio-economic and Tourism	Impact on installation -related employment in the supply chain	Impact on employment in Operation and Maintenance in the supply chain
	Impact on the amount of Gross Value Added (GVA) supported by decommissioning activity	Impact on the amount of Gross Value Added (GVA) supported by operation and maintenance activity
	Impact on access to installation or decommissioning-related employment amongst local residents	Impact on access to Operation and Maintenance related employment amongst residents
	Impact on the demand for housing, accommodation and local services	Impact on demand for housing, accommodation and local services
	Impact on the performance of the renewable energy sector	Impact on the performance of the renewable energy sector
	Impact on offshore and coastal tourism and recreation activity and associated economic value	Impact on offshore and coastal tourism and recreation activity and associated economic value
	Impact on local tourism and recreational resources	Impact on local tourism and recreational resources
Other Users	Reduced sea area to support recreational activities	Reduced sea area to support recreational activities
	Increased risk of collision to other sea users with devices or associated infrastructure	Increased risk of collision to other sea users with devices or associated infrastructure

In addition to the EIA, WFD and HRA assessments will be undertaken.

The WFD will review the relevant coastal/estuarine water bodies that could be potentially affected by the META Project. Specifically, the Milford Haven Inner Transitional Waterbody, Milford Haven Outer Coastal Waterbody and the Pembrokeshire South Coastal Waterbody.

The sHRA(s) will review the European sites that may be affected by the META Project. Separate sHRAs will be provided for onshore and offshore works.

7.2 Consultation

As part of the consenting process for the META Project, MEW will undertake to consult with local and national stakeholders. META has produced this Scoping Report as part of the META Work Package 3 EIA Scoping. EIA Scoping Opinions (from NRW-MLT, and the LPAs; PNCPA and PCC) will result in feedback which will be fed into the ongoing EIA process for the development.

In parallel to requesting Scoping Opinions from the Consenting Authorities, META will also hold two rounds of public consultation events, in the Pembrokeshire area in December 2018 and April 2019. Anyone who could potentially be affected by or may have an active interest in META is encouraged to attend.

7.3 Next Steps

Consultees are invited to consider all the information provided in this EIA Scoping Report and advise on whether they agree with the conclusions.

Following the receipt of the EIA Scoping Opinions, an ES will be produced to support consent/licence application. Further surveys will be undertaken to inform the ES and a project design freeze will be implemented on the 16th November 2018.

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9 Appendices

9.1 Appendix 1 – Regulations, Policy Context, and Consenting Context

9.1.1 Regulations

Regulation 12 of The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)

1. Where an application is made for a regulatory approval in relation to a regulated activity to which this Part applies, neither the regulator nor the appropriate authority may deal with the application or exercise any functions under these Regulations in relation to it until the appropriate authority has received the following material from the applicant:

    a. A chart or map (or both) sufficient to identify where the regulated activity would be carried out and the extent of any operations which it would involve;
    b. A description (including a plan) of the nature of the project, identifying the regulated activity to be carried out in the course of that project;
    c. A statement of the working methods to be used in the course of the project and in carrying out the regulated activity;
    d. An environmental statement in respect of the project; and
    e. A copy of any environmental statement in respect of the project provided or to be provided to any other consenting authority.

2. An environmental statement must:

    a. Be in writing;
    b. Include at least:
        (a) A description of the project and the regulated activity, comprising information on the site, design, size and other relevant features of the project and the regulated activity;
        (b) A description of the likely significant effects of the project and the regulated activity on the environment;
        (c) A description of the features of the project and the regulated activity or the measures envisaged to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;
        (d) A description of the reasonable alternatives studied by the applicant which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;
        (e) A non-technical summary of the information referred to in Paragraphs (i) to (iv); and
        (f) Any additional information specified in Schedule 3 relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.
    c. Where a scoping opinion has been given in accordance with Regulation 13 and Schedule 4, be based on the most recent scoping opinion given (so far as the project remains materially the same as the project which was subject to that opinion);
    d. Include the information reasonably required for reaching a conclusion about the significant effects of the project on the environment, taking into account current knowledge and methods of assessment;

e. (with a view to avoiding duplication of assessments), be prepared taking into account the results of any relevant UK environmental assessment which are reasonably available to the applicant;
f. be prepared by competent persons; and
g. be accompanied by a statement from the applicant outlining the relevant experience or qualifications of such persons.
h. The appropriate authority may specify:
i. The format in which the applicant must provide the material referred to in Paragraph (1); and
j. The number of copies of the material in that format that the applicant must provide to it and to the regulator (if the regulator is not also the appropriate authority).

3. The applicant must comply with any reasonable requirement made in accordance with Paragraph (3) and, until this has been done:

a. The appropriate authority must ensure that it has, or has access as necessary to, sufficient expertise to examine the environmental statement;
b. Neither the regulator nor the appropriate authority need deal further with, or exercise any functions under these Regulations in relation to, the application; and
c. The regulator must not reach its regulatory decision.

4. Where an applicant has failed to comply with the requirements of Paragraphs (1) and (2), or any requirements of the appropriate authority under Paragraph (3), within such reasonable period as the appropriate authority has specified or such longer period as the appropriate authority may reasonably allow:

a. The regulator may treat the application as having been withdrawn; and
b. The appropriate authority (if the regulator is not also the appropriate authority) may direct the regulator to do so.

Schedule 3 of The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)

1. A description of the project and of the regulated activity, including in particular:

a. A description of the location of the project and the regulated activity;
b. A description of the physical characteristics of the whole project and regulated activity, including where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
c. A description of the main characteristics of the operational phase of the project and the regulated activity (in particular any production process): for instance, energy demand and energy used, the nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;
d. An estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases) resulting from the operation of the proposed project and the regulated activity.

2. A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the applicant, which are relevant to the proposed project, the regulated activity and their specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

3. A description of the relevant aspects of the current state of the environment (baseline scenario), and an outline of the likely evolution thereof without implementation of the project, as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.

4. A description of the factors specified in regulation 21A(2)(a) to (e) likely to be significantly affected by the project and the regulated activity: population, human health, biodiversity (for example, fauna and flora), land (for example, land take), soil (for example, organic matter, erosion, compaction, sealing), water (for example, hydromorphological changes, quantity and quality), air, climate (for example, greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.

5. A description of the likely significant effects of the project and the regulated activity on the environment resulting from, inter alia:

a. The construction and existence of the project and the regulated activity, including, where relevant, demolition works;
b. The use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
c. The emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
d. The risks to human health, cultural heritage or the environment (for example, due to accidents or disasters);
e. The cumulation of effects with other existing or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;
f. The impact of the project on climate (for example, the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change; and
g. The technologies and the substances used.

6. The description of the likely significant effects on the factors specified in regulation 21A(2)(a) to (e) must cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project and the regulated activity. This description must take into account the environmental protection objectives established at Union or member State level which are relevant to the project and the regulated activity.

7. A description of the forecasting methods or evidence used to identify and assess the significant effects on the environment including details of difficulties (for example, technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

8. A description of the measures envisaged to avoid, prevent, reduce or if possible offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example, the preparation of a post-project analysis). That description must explain the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and must cover both the construction and operational phases.

9. A description of the expected significant adverse effects of the project and the regulated activity on the environment deriving from the vulnerability of the project and the regulated activity to risks of major accidents or disasters which are relevant to the project and the regulated activity concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU of the European Parliament and of the Council on the control of major accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC or Council Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations or UK environmental assessments may be used for this purpose provided that the requirements of the EIA Directive are met. Where appropriate, this description must include measures

envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.

10. A non-technical summary of the information provided under Paragraphs 1 to 9.

11. A reference list detailing the sources used for the descriptions and assessments included in the report.

9.1.2 Policy Context

UK Marine Policy Statement

This Marine Policy Statement (MPS) is the framework for preparing Marine Plans and taking decisions affecting the marine environment. It will contribute to the achievement of sustainable development in the United Kingdom marine area. It has been prepared and adopted for the purposes of Section 44 of the Marine and Coastal Access Act 2009.

The Secretary of State, Scottish Ministers, Welsh Ministers and the Department of the Environment in Northern Ireland are jointly adopting the MPS. This is a key step towards achieving the vision shared by the UK Administrations (UK Government, Scottish Government, Welsh Assembly Government and Northern Ireland Executive) of having 'clean, healthy, safe, productive and biologically diverse oceans and seas'.

The MPS will facilitate and support the formulation of Marine Plans, ensuring that marine resources are used in a sustainable way in line with the high level marine objectives and thereby:

- Promote sustainable economic development;
- Enable the UK's move towards a low-carbon economy, to mitigate the causes of climate change and ocean acidification and adapt to their effects;
- Ensure a sustainable marine environment which promotes healthy, functioning marine ecosystems and protects marine habitats, species and our heritage assets; and
- Contribute to the societal benefits of the marine area, including the sustainable use of marine resources to address local social and economic issues.

These objectives will be achieved by:

1. Achieving a sustainable marine economy
    a. Infrastructure is in place to support and promote safe, profitable and efficient marine businesses.
    b. The marine environment and its resources are used to maximise sustainable activity, prosperity and opportunities for all, now and in the future.
    c. Marine businesses are taking long-term strategic decisions and managing risks effectively. They are competitive and operating efficiently.
    d. Marine businesses are acting in a way which respects environmental limits and is socially responsible. This is rewarded in the marketplace.
    e. Ensuring a strong, healthy and just society
    f. People appreciate the diversity of the marine environment, its seascapes, its natural and cultural heritage and its resources and act responsibly.
    g. The use of the marine environment is benefiting society as a whole, and contributing to resilient and cohesive communities that can adapt to coastal erosion and flood risk, as well as contributing to physical and mental wellbeing.
    h. The coast, seas, oceans and their resources are safe to use.
    i. The marine environment plays an important role in mitigating climate change.

    j. There is equitable access for those who want to use and enjoy the coast, seas and their wide range of resources and assets and recognition that for some island and peripheral communities the sea plays a significant role in their community.
    k. Use of the marine environment will recognise, and integrate with, defence priorities, including the strengthening of international peace and stability and the defence of the UK and its interests.

2. Living within environmental limits
    a. Biodiversity is protected, conserved and where appropriate recovered and loss has been halted.
    b. Healthy marine and coastal habitats occur across their natural range and are able to support strong, biodiverse biological communities and the functioning of healthy, resilient and adaptable marine ecosystems.
    c. Our oceans support viable populations of representative, rare, vulnerable, and valued species.

3. Promoting good governance
    a. All those who have a stake in the marine environment have an input into associated decision-making.
    b. Marine, land and water management mechanisms are responsive and work effectively together, for example through integrated coastal zone management and river basin management plans.
    c. Marine management in the UK takes account of different management systems that are in place because of administrative, political or international boundaries. Marine businesses are subject to clear, timely, proportionate and, where appropriate, planned regulation.
    d. The use of the marine environment is spatially planned where appropriate and based on an ecosystems approach which takes account of climate change and recognises the protection and management needs of marine cultural heritage according to its significance.

4. Using sound science responsibly
    a. Our understanding of the marine environment continues to develop through new scientific and socio-economic research and data collection.
    b. Sound evidence and monitoring underpins effective marine management and policy development.
    c. The precautionary principle is applied consistently in accordance with the UK Government and Devolved Administrations' sustainable development policy.

Well Being and Future Generations Act 2015

The Well-being and Future Generations (Wales) Act 2015 (WBFGA, 2015) places a duty on public bodies to place the principles of sustainability and sustainable development at the heart of its decision-making processes. The objectives of the WBFGA 2015 are set out as follows:

A Prosperous Wales

- Promoting resource-efficient and climate change resilient settlement patterns which minimise land take and urban sprawl, especially through the reuse of suitable previous development land and buildings, and wherever possible avoiding development of greenfield sites;
- Play an appropriate role to facilitate sustainable building standards;

- Play an appropriate role in securing the provision of infrastructure to form the physical basis for sustainable communities; and
- Support initiative and innovation and avoid placing unnecessary burdens on enterprise to enhance the economic success of both urban and rural areas, helping businesses to maximise their competitiveness.

A Resilient Wales

- Contributing to the protection and improvement of the environment, to improve the quality of life and protect local and global ecosystems.

A Healthier Wales

- Contribute to the protection and, where possible, the improvement of people's health and wellbeing as a core component of achieving the well-being goals and responding to climate change.

A More Equal Wales

- Promoting access to, inter alia, employment, shopping, education and community facilities and open and green space, maximising opportunities for community development and social welfare;
- Promote quality, lasting, environmentally-sound and flexible employment opportunities; and
- Respect and encourage diversity in the local economy.

A Wales of Cohesive Communities

- Locating development to minimise the demand for travel, especially by private car;
- Fostering improvement to transport facilities and services which maintain or improve accessibility to services and facilities, secure employment, economic and environmental objectives, and improve safety and amenity; and
- Fostering social inclusion by ensuring that full advantage is taken of the opportunities to secure a more accessible environment for everyone that the development of land and buildings provides. This includes helping to ensure that the development is accessible by means other than the private car.

A Wales of Vibrant Culture and Thriving Welsh Language

- Helping to ensure the conservation of the historic environment and cultural heritage.

A Globally Responsive Wales

- Support the need to tackle the causes of climate change by moving towards a low carbon economy.

Environment (Wales) Act 2016

The Environment (Wales) Act puts in place the legislation needed to plan and manage Wales' natural resources in a more proactive, sustainable and joined-up way.

The key parts of the act are:

- Part 1: Sustainable management of natural resources – enables Wales' resources to be managed in a more proactive, sustainable and joined-up way. It also helps to tackle the challenges faced and is focused on the opportunities the resources provide;
- Part 2: Climate change – provides the Welsh Ministers with powers to put in place statutory emission reduction targets, including at least an 80% reduction in emissions by 2050 and carbon budgeting to support their delivery. This is vital within the context of the existing UK and EU obligations and sets a clear pathway for decarbonisation. It also provides certainty and clarity for business and investment;
- Part 3: Charges for carrier bags – extends the Welsh Ministers' powers so that they may set a charge for other types of carrier bags such as bags for life. It also places a duty on retailers to donate the net proceeds from the sale of carrier bags to good causes;
- Part 4: Collection and disposal of waste – improves waste management processes by helping to achieve higher levels of business waste recycling, better food waste treatment and increased energy recovery. This will help to decrease pressure on natural resources while also contributing towards positive results for both the economy and the environment;
- Parts 5 & 6: Fisheries for shellfish and marine licensing – clarifies the law in relation to shellfisheries management and marine licensing; and
- Part 7: Flood & Coastal Erosion Committee and land drainage – clarifies the law for other environmental regulatory regimes including flood risk management and land drainage.

Natural Resources Policy

The Natural Resources Policy (NRP) is the second statutory product of the Environment (Wales) Act.

The focus of the NRP is the sustainable management of Wales' natural resources, to maximise their contribution to achieving goals within the Well-being of Future Generations Act. The policy sets out three National Priorities. These are:

- Delivering nature-based solutions;
- Increasing renewable energy and resource efficiency; and
- Taking a place-based approach.

Wales Spatial Plan Update 2008

The Wales Spatial Plan identifies 'Pembrokeshire - The Haven', comprising the 'Haven Towns' of Haverfordwest (including Merlins Bridge) Milford Haven, Neyland, Pembroke and Pembroke Dock, as a strategic Hub that perform an important regional role and should be a focus for future investment.

Draft Welsh National Marine Plan

The draft Welsh National Marine Plan introduces a framework to support sustainable decision-making for the marine environment and includes policies specific to the ports and renewables sectors. Welsh Government are currently reviewing responses to the consultation on the draft Welsh National Marine Plan which ended 29th March 2018. In July 2018 Welsh Government produced a *Consultation - Summary of Response* document (Welsh Government, 2018) which outlines the *Next Steps* that will be taken, namely:

1. The Welsh Government would like to thank all of those who provided feedback and who responded to the consultation for their time and contributions during the consultation period;
2. The Summary of Responses document provides a high-level overview of the responses received and our initial views on the response;
3. Policy officials will consider the responses and discuss options to address any concerns that have been raised. We will also work with the Marine Planning Stakeholder Reference Group to consider how best to develop the final plan;
4. The Cabinet Secretary will publish a statement in the Autumn 2018 detailing how they intend to proceed with the WNMP; and
5. The WNMP will be adopted when Welsh Ministers (with the agreement of the Secretary of State with regard to retained functions) decide to publish the plan.

The META Project will consider the policies within the developing draft Welsh National Marine Plan through the EIA process.

Planning Policy Wales Edition 9 (November 2016)

Planning Policy Wales (PPW) Edition 9, Paragraph 7.1.1 defines economic development as development of land and buildings for activities that generate wealth, jobs and incomes. Economic land uses include the traditional employment land uses (offices, research and development, industry and warehousing), as well as uses such as retail, tourism, and public services.

Paragraph 7.1.3 states the planning system should support economic and employment growth alongside social and environmental considerations within the context of sustainable development.

Paragraph 7.2.2 states local planning authorities (LPAs) are required to ensure that the economic benefits associated with a proposed development are understood and that these are given equal consideration with social and environmental issues in the decision-making process and should recognise that there will be occasions when the economic benefits will outweigh social and environmental considerations.

Paragraph 7.6.1 states LPAs should adopt a positive and constructive approach to applications for economic development.

Technical Advice Note 5: Nature Conservation and Planning (2009)

Technical Advice Note (TAN) 5 Paragraph 1.4.1 states that nature conservation as referred to in statute[4] means the conservation of flora, fauna, geological and physiographical (also called geomorphological) features. Nature conservation, as referred to throughout this TAN, includes the conservation of biodiversity and geodiversity including the natural systems and processes that continue to change the land form, rivers and coasts of Wales.

Paragraph 1.4.3 states that "Conservation" in the context of this TAN, involves preservation, protection, wise use, sustainable management and restoration of the natural heritage. 'Conserving biodiversity' is also defined in statute as including, in relation to a living organism or type of habitat, the restoration or enhancement of a population or habitat.

[4] Section 39 Natural Environmental and Rural Communities Act 2006.

Paragraph 1.4.4 states that Section 40(1)) of Natural Environment and Rural Communities Act 2006 (NERC) places a duty on every public authority, in exercising its functions, to "*have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity*". This TAN sets out the manner in which planning authorities should comply with this duty.

Paragraph 1.6.1 states that biodiversity conservation and enhancement is an integral part of planning for sustainable development.

Paragraph 2.1 states that the town and country planning system in Wales should:

- Integrate nature conservation into all planning decisions looking for development to deliver social, economic and environmental objectives together over time; and
- Ensure that the UK's international and national obligations for site, species and habitat protection are fully met in all planning decisions.

Paragraph 2.3 states that development policies and, where appropriate, supplementary planning guidance, should promote opportunities for the incorporation of wildlife and geological features within the design of development and green infrastructure.

Technical Advice Note 14: Coastal Planning (1998)

TAN 14 Paragraph 3 states that generally the coastal zone is an area of land and adjacent sea that are considered to be mutually independent. It is a complex and dynamic zone. The physical processes which together produce the beaches, sand dunes, mudflats, cliffs and rocky shores can be defined as land, intertidal and subtidal, whilst littoral and sublittoral zones are categorisations of biological criteria relating to the influence of maritime conditions. Legal criteria such as land, foreshore and seabed definitions reflect man's use of the coastal zone.

Paragraph 4 states that it is for each LPA to consider and define the most appropriate coastal zone in its area. Because the boundaries of local authorities may not equate with coastal features and processes, this should be done in consultation with neighbouring authorities and in the knowledge that the overall limits of the coastal zone are determined by the geographical extent of coastal physical processes and human activities related to the coast. For land-use planning purposes the seaward limit of the coastal zone is generally mean low water mark, but between high and low water mark the planning system usually needs to operate in tandem with a range of sectoral controls over coastal and marine development.

Paragraph 5 states that decision on development proposals below low water mark are generally outside the scope of the planning system and are instead regulated according to the type of activity.

Paragraph 8 states that planning consideration will vary depending on the nature of the coastline, but there are a number of specific issues in relation to the coastal zone that the planning system should address. These are, in terms of:

i. Proposals for Development:
   a. The nature of the conditions and physical processes and the potential need for remedial and defence work;
   b. Likely effects on physical and biological processes along the coast;
   c. The potential effects on mineral, water and conservation resources; as well as high-quality agricultural and; and
   d. Any potential visual impact from both land and sea.

ii. Nature and Landscape Conservation:
   a. The role of physical and biological processes in creating, maintaining and altering features of nature and landscape conservation value;

b. The effects of statutory and other nature and landscape conservation policies in the coastal zone, which may not always be contiguous with the low water mark; and
c. The importance of the integrity and special features of Marine Nature Reserves, candidate SACs and coastal SACs, SPAs and Ramsar sites. EC Directives relevant to planning in the coastal zone should always be borne in mind.

Technical Advice Note 18: Renewable Energy (2005)

TAN 18 Paragraph 1.3 states that energy policy is a reserved function that is not devolved to the Assembly Government (Welsh Government). Nevertheless, all decisions relating to renewable energy in Wales must take account of the Assembly Government's policy.

Paragraph 1.6 states that as well as developing new sources of renewable energy which are essential to meeting the targets set by energy policy, the Assembly Government is fully committed to promoting energy efficiency and energy conservation. The land use planning system is one of a number of mechanisms which can help deliver improved energy efficiency and LPAs are expected to consider matters of energy efficiency when considering planning policy and applications.

Paragraph 3.2 states that other onshore technologies provide energy in the form of electricity and heat. Some of the 2010 renewable electricity target will be met from these technologies, but the likelihood is that it will only be a small proportion. This is, however, neither to underestimate their value nor a sign of any lack of the Assembly Government's commitment to their implementation.

Technical Advice Note 23: Economic Development (October 2014)

TAN 23 Paragraph 1.1.1 states economic development can include any form of development that generates wealth, jobs and income. It is important that the planning system recognises the economic aspects of all development and that planning decisions are made in a sustainable way which balance social, environmental and economic considerations.

Paragraph 1.1.5 states economic land uses also include construction.

Paragraph 1.2.1 states the economic benefits associated with development may be geographically spread out far beyond the area where the development is located. Consequently, it is essential that the planning system recognises, and gives due weight to, the economic benefits associated with new development.

Paragraph 1.2.2 advises that planning for economic land uses should aim to provide the land that the market requires, unless there are good reasons to the contrary. Where markets work well, this will help maximise economic efficiency and growth.

Paragraph 1.2.5 states LPAs should recognise market signals and have regard to the need to guide economic development to the most appropriate locations, rather than prevent or discourage such development.

Paragraph 2.1.2 states economic development would cause environmental or social harm which cannot be fully mitigated, careful consideration of the economic benefits will be necessary.

Paragraph 2.1.5 states that where an LPA is considering a planning application that could cause harm to the environment or social cohesion the following three questions should be asked to help clarity and balance the economic, social and environmental issues:

- Alternatives: if the land is not made available (the site is not allocated, or the application is refused), is it likely that the demand could be met on a site where development would cause less harm, and if so where?
- Jobs accommodated: how many direct jobs will be based at the site?
- Special merit: would the development make any special contribution to policy objectives?

Paragraph 2.1.13 advises that the planning system should support, in particular, the low-carbon economy, innovative business or technology clusters and social enterprises which are defined as businesses that are particularly important in providing opportunities for social groups disadvantaged in the labour market. Developments that will provide space for these categories of businesses count as making special policy contributions.

Pembrokeshire Local Development Plan (February 2013)

The Pembrokeshire Local Development Plan (LDP), adopted February 2013, Proposals Map identifies the Warrior Way site as within the settlement boundary of Pembroke Dock (Policy SP 13) and within a Conservation Area (Policy GN.38). The Milford Haven is designated as a SAC (Policy GN.37).

The LDP states that strategic priorities included in the Rural Development Plan include energy (including renewables) and that the energy sector (renewable energy technology in particular) is important as a potential growth sector in the Waterway area. Policies under the LDP, relevant to this project include:

Policy SP1 'Sustainable Development' states all development proposals must demonstrate how positive economic, social and environmental impacts will be achieved and adverse impacts minimised.

Policy SP 2 'Port and Energy Related Development' states development at the Port of Milford Haven, which includes the dock area at Pembroke Dock, will be permitted for port related facilities and infrastructure, including energy related development.

Policy SP 13 'Settlement Boundaries' states Settlement Boundaries define the areas within which development opportunities may be appropriate.

Policy GN.1 'General Development Policy' states development will be permitted where the following criteria are met:

- The nature, location, siting and scale of the proposed development is compatible with the capacity and character of the site and the area within which it is located;
- It would not result in a significant detrimental impact on local amenity in terms of visual impact, loss of light or privacy, odours, smoke, fumes, dust, air quality or an increase in noise or vibration levels;
- It would not adversely affect landscape character, quality or diversity, including the special qualities of the Pembrokeshire Coast National Park and neighbouring authorities;
- It respects and protects the natural environment including protected habitats and species;
- It would take place in an accessible location, would incorporate sustainable transport and accessibility principles and would not result in a detrimental impact on highway safety or in traffic exceeding the capacity of the highway network;
- Necessary and appropriate service infrastructure, access and parking can be provided;
- It would not cause or result in unacceptable harm to Health and Safety;
- It would not have a significant adverse impact on water quality; and
- It would neither contribute to the coalescence of distinct settlements nor create or consolidate ribbon development.

Policy GN.2 'Sustainable Design' states development will be permitted where relevant criteria are met:

- It is of a good design which pays due regard to local distinctiveness and contributes positively to the local context;

- It is appropriate to the local character and landscape/townscape context in terms of layout, scale, form, siting, massing, height, density, mix, detailing, use of materials, landscaping and access arrangements / layout;
- It incorporates a resource efficient and climate responsive design through location, orientation, density, layout, land use, materials, water conservation and the use of sustainable drainage systems and waste management solutions; and
- It achieves a flexible and adaptable design.

Policy GN.4 'Resource Efficiency and Renewable and Low-carbon Energy Proposals' states that development proposals should seek to minimise resource demand, improve resource efficiency and seek power generated from renewable resources, where appropriate. They will be expected to be well designed in terms of energy use. Developments which enable the supply of renewable energy through environmentally acceptable solutions will be supported.

Policy GN.35 'Protection of Open Spaces with Amenity Value' states development that would adversely affect the appearance, character or local amenity value of areas of public and private open space will not normally be permitted. In exceptional circumstances, where the proposal will bring clear social and/or economic benefits to the local community and make a positive contribution to the built environment, development may be permitted where it can be demonstrated that no suitable alternative site is available.

Policy GN.37 'Protection and Enhancement of Biodiversity' states all development should demonstrate a positive approach to maintaining and, wherever possible, enhancing biodiversity. Development that would disturb or otherwise harm protected species or their habitats, or the integrity of other habitats, sites or features of importance to wildlife and individual species, will only be permitted in exceptional circumstances where the effects are minimised or mitigated through careful design, work scheduling or other appropriate measures.

Pembrokeshire Coast National Park Local Development Plan (September 2010)

The Pembrokeshire Coast National Park Local Development Plan, adopted September 2010, Proposals Map identifies Dale Roads and East Pickard Bay as within the Pembrokeshire Coast National Park planning jurisdiction (Policy 1) and within Natura 2000 Sites. Warrior Way is located within the Wales Spatial Plan Strategic Hub and the PCC planning jurisdiction. Dale Roads and East Pickard Bay (including the onshore infrastructure) are located within areas designated as Nature Conservation Designations (SAC, SPA and/or SSSI) and Heritage Coast.

Policy 1 'National Park Purposes and Duty (Strategy Policy)' states all development within the National Park must be compatible with:

a) The conservation or enhancement of the natural beauty, wildlife and cultural heritage of the Park; and
b) The public understanding and enjoyment of those qualities.

In determining proposals, due regard will be paid to the need to foster the economic and social well-being of the local communities within the Park provided this is compatible with the statutory National Park purposes embodied in the foregoing considerations.

Policy 10 'Local Site of Nature Conservation or Geological Interest' states that development that would be liable to significantly harm the nature conservation value of a Local Nature Reserve or other site of local nature conservation interest, or the main features of interest within a Regionally Important Geodiversity Site, will only be permitted if the importance of the development outweighs the local value of the site and mitigation, minimisation or off setting has been investigated.

Policy 11 'Protection of Biodiversity' states that development that would disturb or otherwise harm protected species or their habitats or the integrity of other habitats, sites or features of importance to wildlife and individual species including Local Biodiversity Action Plan species and habitats will only be permitted where the effects will be acceptably, minimised or mitigated through careful design, work scheduling or other measures.

Policy 15 'Conservation of the Pembrokeshire Coast National Park' states that development will not be permitted where this would adversely affect the qualities and special character of the Pembrokeshire Coast National Park by:

a) Causing significant visual intrusion; and/or;
b) Being insensitively and unsympathetically sited within the landscape; and/or
c) Introducing or intensifying a use which is incompatible with its location; and/or
d) Failing to harmonise with, or enhance the landform and landscape character of the National Park; and/or
e) Losing or failing to incorporate important traditional features.

Policy 17 'Shore Based Facilities' states that development of shore based facilities including those linked to proposals below mean low water, will be permitted within the developed areas of the coast where compatible with adjacent uses.

Policy 33 'Renewable energy (Strategy Policy)' states that small scale renewable energy schemes will be considered favourably, subject to there being no over-riding environmental and amenity considerations. Medium scale schemes also offer some potential and will be permitted subject to the same considerations. Large scale renewable energy schemes will only be permitted where they do not compromise the special qualities of the National Park. Where there are other renewable energy schemes already in operation in the area, cumulative impacts will be an important consideration.

Policy 33 also states that onshore connections to offshore renewable energy generators will also be permitted subject to there being no over-riding environmental and amenity considerations. Developers requiring an undeveloped coastal location for onshore connections to offshore renewable energy installations will need to clearly justify this need in relation to Policy 8i[5] with the least obtrusive approach to design being taken.

Registered Historic Landscapes

The META Project includes two sites - Dale Roads and Warrior Way - that lie wholly within the non-statutory 'MHW Landscape of Outstanding Historic Interest in Wales' area. The East Pickard Bay site overlap along its eastern edge with the non-statutory 'MHW Landscape of Outstanding Historic Interest in Wales' (Figure 9-1).

[5] **Policy 8i** Special Qualities – Development of the undeveloped coast is avoided and sites within stretched of the developed coast are protected for uses that need a coastal location – see Policy 17, Policy 18, Policy 33 and Policy 35

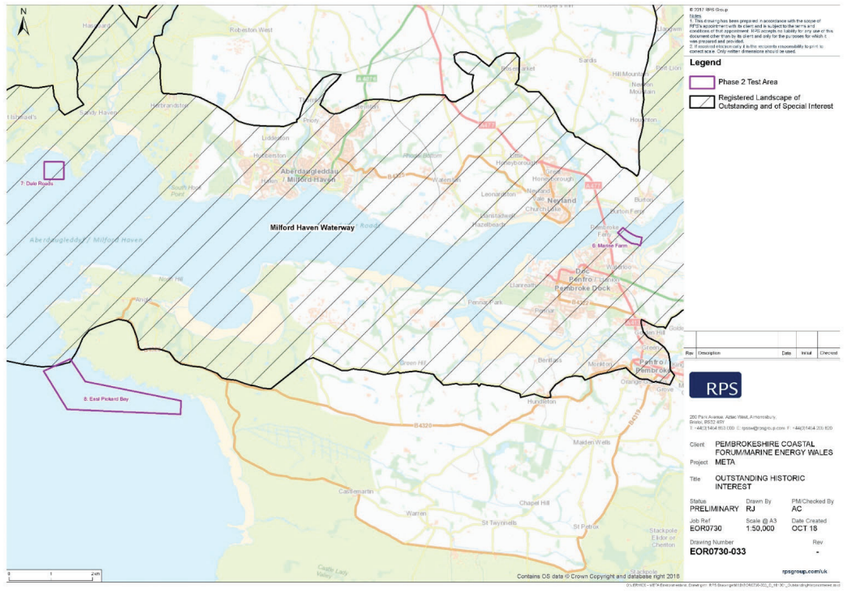

Figure 9-1: Milford Haven Waterway Landscape of Outstanding Historic Interest in Wales

9.2 Appendix 2 - META Phase One Consultation Response from NRW-MLT

Cyfoeth Naturiol Cymru
Natural Resources Wales

Ein cyf/Our ref: PA00718

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Caerdydd / Cardiff

Ebost/Email:
zoe.mcmellin@cyfoethnaturiolcymru.gov.uk

Ffôn/Phone: 0300 065 4374

Sent by e mail to
C/O Ms Bethan Simes

Date 22nd October 2018

Dear Ms Simes

REVIEW OF MARINE ENERGY WALES, MARINE ENERGY TEST AREA (META) PHASE 1 TECHNICAL NOTE (11/09/2018, REV 04)

Natural Resources Wales Permitting Service (NRW PS) were requested to review and provide comment on the Marine Energy Wales, Marine Energy Test Area (META) Phase 1, Technical Note document by Marine Energy Wales (MEW). Clarification was sought on whether it should be read in conjunction with the Site Selection Report, META draft PDE and META Consenting Strategy referenced within the Technical Note. META advised that a review of the additional documents was not considered necessary. Therefore, the additional documents have not been assessed.

Advisory colleagues have not been consulted on the content of the Technical Note in line with instructions from MEW.

The purpose of the review is to provide advice in relation to the Marine Licensing requirements under the Marine and Coastal Access Act 2009 and The Marine Licensing (Exempted Activities) (Wales) Order 2011.

Marine Licensing under the Marine and Coastal Access Act 2009 (MCAA 2009) is a requirement in addition to any other permission Milford Haven Port Authority (MHPA) may issue. A Marine Works Licence from MHPA, nor any other permit from any other Authority, absolves the developer from obtaining the appropriate permit(s) from Natural Resources Wales.

META Phase 1 Sites identified in the Technical Note all have elements below MHWS and are therefore within the marine licensable area (see section 42 of the Marine and Coastal Access Act 2009 for further details of the marine licensable area).

As set out in section 66 of the Marine and Coastal Access Act 2009, the following activities identified within the Technical Note, require a marine licence:

66 Licensable marine activities
(1) For the purposes of this Part, it is a licensable marine activity to do any of the following—

1. *To deposit any substance or object within the UK marine licensing area, either in the sea or on or under the sea bed, from—*

   (a)any vehicle, vessel, aircraft or marine structure,
   (b)any container floating in the sea, or
   (c)any structure on land constructed or adapted wholly or mainly for the purpose of depositing solids in the sea.

3. *To deposit any substance or object anywhere in the sea or on or under the sea bed from a vehicle, vessel, aircraft, marine structure or floating container which was loaded with the substance or object—*

   (a)in any part of the United Kingdom except Scotland, or
   (b)in the UK marine licensing area.

7. *To construct, alter or improve any works within the UK marine licensing area either— (a)in or over the sea, or*
   (b)on or under the sea bed.

8. *To use a vehicle, vessel, aircraft, marine structure or floating container to remove any substance or object from the sea bed within the UK marine licensing area.*

For the complete list of marine licensable activities view the following link:

https://www.legislation.gov.uk/ukpga/2009/23/contents

There are exemptions from marine licensing requirements which may be applied in certain circumstances. These are detailed in the The Marine Licensing (Exempted Activities) (Wales) Order 2011 and in Part 4 chapter 2 of MCAA 2009.

Please note, there is no marine licence exemption for ‘general port activities’. Licensable marine activities are only exempt if they meet the requirements of a relevant article in the 2011 exemptions order or Part 4 chapter 2 of MCAA 2009.

It is unclear from the Technical Note whether dredging and / or disposal will be required under Phase 1 of the project. If dredging and / or disposal is required under Phase 1 it may be exempt under Part 4 chapter 2 of MCAA 2009.

The exemptions, under the 2011 order, that may be of relevance to the proposed Phase 1 works are outlined below with our advice in relation to their applicability to the proposed works:

Article 16 Scientific Instruments
16.*—(1) Article 4 applies—*

(a)to the deposit of any scientific instrument or associated equipment in connection with any scientific experiment or survey;
(b)to the deposit of any reagent;
(c)to the deposit of any tracer;
(d)to a removal activity carried on for the purpose of removing any scientific instrument or associated equipment referred to in sub-paragraph (a).
(2) Sub-paragraphs (b) and (c) of paragraph (1) are subject to conditions 1 and 2.
(3) Condition 1 is that the reagent or tracer must be one the use of which is for the time being approved for the purposes of this Order by the licensing authority.
(4) Condition 2 is that the reagent or tracer must be used in accordance with any conditions to which the approval is subject.
(5) But article 4 does not apply to —

(a)any such deposit made for the purpose of disposal;
(b)any such deposit that causes or is likely to cause obstruction or danger to navigation;
(c)any such deposit or removal activity–
(i)*that falls within sub-paragraph (a) or (b) of paragraph 6; and*
(ii)that is not directly connected with or necessary to the management of the site referred to in that sub-paragraph.
(6) A deposit or removal activity falls within this paragraph if—
(a)it is a plan or project likely (either alone or in combination with other plans or projects) to have a significant effect on a European site; or
(b)it is likely to have an effect on a Ramsar site.
*(7) In sub-paragraphs (a) and (b) of paragraph (6), "likely" has the same meaning as in Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora(***1***).*

This exemption applies specifically to any scientific instrument or associated equipment in connection with any scientific experiment or survey. There may be components of the Phase 1 projects which comply with the requirements of Paragraph 16 such as ROV (Remote Operated Vehicle), wave buoy and ADCP (Acoustic Doppler Current Profiler) deployments.

Further guidance on how to comply with Paragraph 16 can be found here:

https://naturalresources.wales/permits-and-permissions/marine-licensing/faqs/?lang=en

Article 24 Moorings and aids to navigation

24.*—(1) Article 4 applies—*
(a)to a deposit or works activity carried on by a person referred to in paragraph (2) for the purpose of providing a pile mooring, swinging mooring, trot mooring or aid to navigation;
(b)to a removal activity carried on by any such person for the purpose of removing any such mooring or aid to navigation.
(2) The persons are—
(a)a Harbour Authority;
(b)a lighthouse authority;
(c)any other person, where the activity is carried on in accordance with a consent required from, and granted by, any such authority.
(3) But article 4 does not apply to any such activity which consists of the deposit or the construction of a pontoon.

The following exemption could apply for the deployment and removal of marker buoys (aids to navigation) and identified moorings but specifically not for the construction of pontoons.

In accordance with the licensable marine activities set out in MCAA 2009, and copied above, a marine licence is required for the deposit or retrieval of a substance / instrument / component from a vehicle / vessel / marine structure or floating container within the marine licensable area. This means that the following activities listed within the Technical Note will require a marine licence:

Dip testing;
Testing of deployment and retrieval methodologies;
Testing recovery methodologies;
Testing of instruments, components and sub assemblies: and
Testing engineering research and monitoring equipment.

The nature of the activities to be undertaken e.g. low impact, short duration and negligible potential environmental impact does not determine whether an activity is a 'licensable marine activity' and

therefore requires a marine licence, this is however considered in the 'Band' of marine licence that is required. There are three bands of marine licence application. Band 1 is a simplified licensing process for certain low risk activities, Band 2 are small to medium scale works and Band 3 are large/complex applications.

For more information on marine licence application bands and licensable marine activities please see the following webpages:

https://naturalresources.wales/permits-and-permissions/marine-licensing/marine-licence-fees/?lang=en

https://www.legislation.gov.uk/wsi/2017/280/contents/made

Those activities identified above that require a marine licence do not fall within the activities listed in the Band 1 guidance. A Band 1 licence can only be issued for eligible activities that have been identified in the legislation, (The Marine Licensing (Application Fees) (Wales) Regulations 2017).

Based on the information presented in the META Phase 1 Technical Note, one Band 2 marine licence application would be required to permit the deposit and removal activities at all five identified META Phase 1 sites. The cost of the marine licence application will be a fixed fee of £1920. The application would need to be advertised to the public and consulted upon and should take no more than 4 months to determine. The application must be supported by relevant documentation including evidence to support a Habitats Regulations Assessment (HRA) and a Water Framework Directive assessment (WFD).

Advice on how to apply for Band 2 marine licence and the relevant forms and fee can be found at the following link:

https://naturalresources.wales/permits-and-permissions/marine-licensing/licence-application-forms/?lang=en

This advice has been based on the information provided in the Phase 1 Technical Note (11/09/2018). Any significant changes to the proposal may warrant an alternative approach.

A summary of your questions and responses to them can be found in Annex 1. If you require further clarification, please do not hesitate to contact me.

Yours sincerely

Z McMellin

Zoe McMellin
Marine Licensing Team
Natural Resources Wales

Annex 1

Summary

The information above should help you progress with the development of the META site. With reference to your specific questions the information has been summarised.

1.) Are any activities listed in this technical note exempt from marine licensing?

There are activities listed in this Technical Note that could be considered exempt from the requirements of marine licensing but these are specific activities and have been identified above e.g., Paragraph 16 - ROV deployment, Paragraph 24 – providing aids to navigation. The majority of activities are considered marine licensable.

There is no marine licence exemption for 'general port activities'. Licensable marine activities are only exempt if they meet the requirements of a relevant article in the 2011 exemptions order or Part 4 chapter 2 of MCAA 2009.

It is unclear from the Technical Note whether dredging and / or disposal will be required under Phase 1 of the project. If dredging and / or disposal is required under Phase 1 it may be exempt under Part 4 chapter 2 of MCAA 2009. MHPA would need to provide evidence demonstrating compliance with this requirement if dredging under Phase 1 is required.

75Exemptions for certain dredging etc activities
(1)A marine licence is not needed for a dredging or spoil disposal activity if
(a)the conditions in subsection (2) are met, and
(b)where the activity involves the disposal or recovery of waste materials, the additional conditions in subsection (2A) are met
(2)The conditions are—
(a)that the activity is undertaken by or on behalf of a Harbour Authority, and
(b)that the activity is authorised by, and carried out in accordance with, any legislation falling within subsection (3).
(2A)The additional conditions are—
(a)that the activity involves the relocation of sediments inside surface waters,
(b)that the activity is for the purpose of—
(i)managing waters or waterways,
(ii)preventing floods,
(iii)mitigating the effects of floods or droughts, or
(iv)land reclamation, and
(c)that it is proved to the satisfaction of the appropriate licensing authority for the area in which the activity is to be undertaken that the sediments are not hazardous waste.]
(3)The legislation is—
(a)any local Act,
(b)any order under section 14 or 16 of the Harbours Act 1964 (c. 40),
(c)any order under section 1 of the Harbours Act (Northern Ireland) 1970 (c. 1 (N.I.)), or
(d)section 10(3) of that Act.
(4)In this section—
"dredging or spoil disposal activity" means—
(a)any dredging operation, or
(b)the deposit of any dredged materials that result from an exempt dredging operation;

"exempt dredging operation" means a dredging operation for which a marine licence is not needed by virtue of this section.
(5) Any expression used in subsection (1)(b) or (2A) and also in [F5Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste] has the same meaning as in that Directive.]

2.) If a marine licence is needed, would we require a Band 1 or Band 2?

One Band 2 marine licence is considered appropriate for all the activities at all of the Phase 1 sites listed in the Technical Note.

Dip testing;
Testing of deployment and retrieval methodologies;
Testing recovery methodologies;
Testing of instruments, components and sub assemblies: and
Testing engineering research and monitoring equipment.

One marine licence application could be submitted to cover all of the Phase 1 marine licensable activities at all five identified sites together with the appropriate supporting information and co-ordinates defining an area for each of the sites. If you require further information regarding how the supporting information should be submitted please contact us.

3.) If the Port of Milford Haven held the license for Phase 1, would this affect the response to questions 1 and 2?

The Port of Milford Haven could hold the Licence for Phase 1 but it would have no effect on the answers to questions 1 or 2. None of those activities listed as requiring a marine licence are exempt if undertaken by a Harbour Authority.

As advised, some of the exemptions listed within the 2011 Order only apply to certain organisations, of which the Harbour Authority is one, where they exempt certain works undertaken by or on behalf of them. These include:

Article 22 Maintenance of harbour works

22.*—(1) Article 4 applies to a deposit, removal activity or works activity carried on by or on behalf of a Harbour Authority for the purpose of maintaining any harbour works.*

(2) Paragraph (1) is subject to the condition that the activity is carried on within the existing boundaries of the works being maintained.

This exemption does not include fundamental alterations to the use of a structure. Harbour works would be small / minor in nature and consist of maintaining an asset or structure to its intended purpose, within the existing boundary of the asset or structure. For example, the removal of boulders from a slipway or repairing a harbour wall following accidental damage during the course of operations.

Article 23 Removal of obstruction or danger to navigation

23.*—(1) Article 4 applies to a removal activity carried on by a person referred to in paragraph (2) for the purpose of removing anything causing or likely to cause obstruction or danger to navigation.*
(2) The persons are—

*(a)a conservancy authority (within the meaning given by section 313(1) of the Merchant Shipping Act 1995(**1**);*
(b)a Harbour Authority;
(c)a lighthouse authority;
(d)a person having powers under any enactment or statutory order to work or maintain a canal or other inland navigation, including a navigation in tidal water.

Article 23 may be relevant to a specific activity undertaken by the Harbour Authority however it is not considered relevant to those retrieval activities listed in the Technical Note. The deposit operations identified should never cause an obstruction or danger to navigation.

MARINE ENERGY WALES

MARINE ENERGY TEST AREA (META)

Environmental Impact Assessment: Appendices

Appendix 4.2. - Scoping Opinion

EOR0730

Marine Energy Test Area

Rev: N/A

March 28, 2019

Cyfoeth Naturiol Cymru
Natural Resources Wales

Ein cyf/Our ref: SC1817
MMO ref: EIA/2018/00059
Ty Cambria
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CF24 0TP

Ebost/Email:
peter.morrison@cyfoethnaturiolcymru.gov.uk
Ffôn/Phone: 0300 065 4542

Sent via email

28 March 2019

Dear Nicola Simpson,

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

ELECTRICITY WORKS (ENVIRONMENTAL IMPACT ASSESSMENT) (ENGLAND AND WALES) REGULATIONS 2017

MARINE ENERGY TEST AREA (META)

I am writing further to your request for a scoping opinion, dated 16 November 2018, made in accordance with The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) ("The Regulations"). I am also writing on behalf of the Marine Management Organisation (MMO) who received a scoping opinion request in relation to a consent required under section 36 of the Electricity Act 1989 (as amended), which the MMO is currently responsible for administering within Welsh inshore waters as transferred under the section 12 of the Marine and Coastal Access Act 2009 ("the 2009 Act"). The MMO are responsible for consenting functions under section 36(1), (5) and (7) of the Electricity Act 1989 (as amended), for the construction or extension of generating stations. From 1 April 2019 the MMO's consenting functions under Section 36 of the Electricity Act 1989 (as amended) will be transferred to Welsh Government. This scoping opinion is provided as a joint opinion on behalf of both Natural Resources Wales Permitting Service (NRW PS) and the MMO. Screening opinions have been issued individually by each organisation under the relevant regulations.

The purpose of the Environmental Impact Assessment (EIA) screening procedure is to determine whether the proposed works require an Environmental Impact Assessment and submission of an Environmental Statement (ES). The purpose of the scoping procedure is to determine what information should be provided in the ES.

In reaching our Screening Opinion NRW PS have considered the proposed works against Schedule A1 and A2 of The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended). In reaching our scoping opinion NRW PS and MMO have had regard to the information provided in the "Marine Energy Wales, Marine Energy Test Area (META) Environmental Impact Assessment Scoping Report", dated 16 November 2018 and "Evidence Report" dated 15 March 2019, and considered the requirements of Schedule 3 of the Marine Works Regulations. We have also consulted with the bodies that we consider have an interest in the project by reason of their environmental responsibilities, or local or regional competences, as required by the above regulations, and had regard to their comments.

Screening Opinion

It is our opinion that Phase 2 of the META project falls within the categories of project listed within Schedule A2, paragraph 13 and/or 20 of the above regulations (see below), and therefore must be considered in terms of its size, nature and location having regard to the relevant criteria listed in Schedule 1 of the above regulations.

> *13. Industrial installations for the production of electricity, steam and hot water (unless included in Schedule A1).*
> *20. Installations for hydroelectric energy production.*

We have carefully considered the views of the consultation bodies alongside the criteria as set out in Schedule 1 of the regulations, and have determined, based on the information provided; that the project has the potential to have a significant effect on the environment and therefore a statutory Environmental Impact Assessment is required.

We have come to this conclusion on the basis of the likely significant impacts of the project, specifically with regard to the scale of the project, split across three sites within and adjacent to Milford Haven Waterway, all of which are within designated nature conservation sites. We have also come to this conclusion due to the nature of the project which will involve regular installation, testing and removal of wave and tidal devices and components over a 25-year period, which is likely to have significant environmental impacts on seabed habitats and species, mobile species and other users of the sea.

Scoping Opinion

This letter sets out the additional information that NRW PS and MMO consider necessary to be included and/or assessed in the ES for this Project.

Please note our scoping opinion is based on the information available to us at this time. The information provided is not 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.

This Screening and Scoping Opinion will be provided to all those bodies that were consulted and will be publicised on our website and on our Public Register.

The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)
Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2017

Scoping Opinion (SC1817)

Summary of the proposal

The Marine Energy Test Area (META) Project consists of eight marine test sites within the Milford Haven Waterway and adjacent waters. This scoping opinion covers phase 2 of the META project which includes three of the test sites: Warrior Way (Site 6); Dale Roads (Site 7); and East Pickard Bay (Site 8). The META project aim is to provide a series of pre-consented, non-grid connected, marine energy test areas that will allow for the deployment and testing of devices, components and subassemblies, and ancillary activities and equipment, in support of marine energy testing.

The activities that will be supported at the phase 2 sites are:

- Scale wave device testing;
- Scale tidal device testing;
- Full scale wave device testing;
- Micro tidal device testing;
- Testing of remotely operated vehicle (ROV) or other monitoring equipment;
- Site preparation methodologies;
- Decommissioning methodologies;
- Salvage methodologies; and
- Tow, float and mooring solution testing for floating offshore wind technology.

Location

The phase 2 META sites are located within Milford Haven Waterway and adjacent waters in Pembrokeshire.

The Warrior Way site is located within the Waterway offshore from the Pembrokeshire Science and Technology Park, south east of Pembroke Ferry, and at the mouth of the Cosheston Pill. The Warrior Way site encompasses an area of 10,900 m^2 (10.9 Ha) and lies entirely within the Pembrokeshire Marine / Sir Benfro Forol Special Area of Conservation (SAC).

The Dale Roads site lies outside the Dale shelf anchorage within the Waterway to the west of Great Castle Head, and south of St Ishmael's. The site encompasses an area of 196,200 m^2 (19.62 Ha) and lies entirely within the Pembrokeshire Marine/ Sir Benfro Forol SAC.

The East Pickard Bay site overlaps with the southern boundary of the Waterway. It lies immediately south of Sheep Island and runs south-eastward parallel to the coast towards Freshwater West Bay. The East Pickard Bay site encompasses an area of 2,580,000 m^2 (258 Ha) and lies entirely within the Pembrokeshire Marine/ Sir Benfro Forol SAC.

Consultation Responses Received

In considering the scoping report, the NRW PS consulted with various consultation bodies. The consultation bodies that responded are listed below:

- Natural Resources Wales Technical Experts (NRW TE)
- Maritime and Coastguard Agency (MCA)
- Trinity House Lighthouse Service (THLS)
- Royal Yachting Association (RYA)
- Pembrokeshire County Council (PCC)
- Royal Society for the Protection of Birds (RSPB)
- Welsh Government (WG)
- Cadw
- Dyfed Archaeological Trust
- Chamber of Shipping
- NATS Safeguarding
- BEIS
- ABPmer (underwater noise and vibration)

0. General comments

0.1. Evidence Report dated 15 March 2019 was submitted in order to provide clarification/changes to the project that was detailed within the Scoping Report submitted November 2018. The Evidence Report detailed the intention to scope out of the EIA/ES works associated with the onshore cable route and compound as these works will be progressed by another developer. We disagree that the onshore/terrestrial impacts can be scoped out of the EIA/ES. We consider that the onshore works and infrastructure are part of the same project as the offshore development and offshore cable and therefore must be considered within the EIA/ES.

0.2. Marine and coastal guidance produced by NRW that may provide useful information to help with your project is available here: https://naturalresources.wales/guidance-and-advice/business-sectors/marine/marine-and-coastal-guidance/?lang=en

0.3. The Cumulative Impact Assessment (CIA) must as a minimum consider the cumulative effects of META phase 2 with:

- META phase 1;
- Dredging activities;
- Disposal activities
- Egnedol Wales Ltd 350MW land based green energy scheme
- Draft Welsh National Marine Plan

0.4. The following data sources may provide useful information for the assessment of cumulative effects:
- Marine Licence applications: http://lle.gov.wales/catalogue/item/MarineLicences/?lang=en
- The Nationally Significant Infrastructure Projects register: https://infrastructure.planninginspectorate.gov.uk/projects/register-of-applications/
- The Developments of National Significance Register: http://gov.wales/docs/desh/publications/180312-dns-register-en.pdf
- Planning Policy e.g. Local Development Plans, Transport Plans (National and Local) and National Policy Statements.

0.5. The ES submitted must demonstrate consideration of the points raised in this scoping opinion. It is recommended that a table is provided in the ES summarising the scoping opinion comments and how they are addressed in the ES.

0.6. The EIA must be undertaken by a competent person and the ES must include a competent expert statement.

1. Non-Technical Summary

1.1. Page A-iii mentions licence applications that are required for the project. Consideration should be given to whether any other licences or consents are required, such as safety zone consent under the Energy Act, a Flood Risk Activity Permit, SSSI consent or a Species licences. It should be noted that some of these consents can be administered through the Marine Licence application.

1.2. Section 1.1 refers to the pre 2017 amended Marine Works EIA regulations, such as referring to the development falling under schedule 2 , 3a and 3c, rather than schedule A2 section 13 and 20. The EIA/ES must refer to the relevant provisions in the current (2017) regulations. The scoping report quotes incorrect provisions of the Marine Works EIA regulations (MWR) in other sections too. This must be corrected in the ES.

2. The Proposed Development

2.1. Section 2.2 – As set out in Schedule 3 paragraph 2 of the MWR, the ES must include a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the applicant, which are relevant to the proposed project, the regulated activity and their specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

2.2. Section 2.3.1 - The paragraph makes reference to advice provided by NRW PS which was provided in relation to a request to review the phase 1 technical note, seeking advice from NRW PS on the marine licensable activities under the Marine and Coastal Access Act 2009, proposed for phase 1. The technical note reviewed only covered phase 1 and the advice provided was specifically in relation to which activities were marine licensable, based solely on the information contained within that report, which was made clear in the response. NRW PS specifically asked whether the consenting strategy and/or site selection report should be reviewed and was advised to only review the technical note. Nowhere in the report or request was NRW PS asked to comment on the requirement for EIA (or any other

assessments such as a Habitats Regulations Assessment (HRA) or Water Framework Directive (WFD) assessment. The procedure for obtaining a screening opinion is set out in Reg 11 and Schedule 2 of the EIA Regulations, and includes a number of procedural requirements such as consultation and the placing of information on the public register. As such, the advice provided by NRW PS to MEW regarding the phase 1 technical note cannot be taken to imply a negative screening opinion, as this section of the scoping report seeks to assert. However, having now received the Marine Licence application for the phase 1 works NRW PS has considered the application of the MWR to this project and determined that an EIA is not required for phase 1.

2.3. The description of the project as a whole is clear but there is some detail lacking on the following aspects which must be provided in the ES:
- scale of the devices;
- footprint on the seabed;
- type of devices;
- type of turbines;
- description of the wave devices;
- operational and maintenance activities
- monitoring activities such as any pre-deployment grab sampling
- decommissioning – it is unclear what the decommissioning phase will consist of.

2.4. Some of the terminology used in the description of the Project Design Envelope (PDE) has not been described sufficiently. For example “surface piercing structures” or “sub-surface testing” have not been explained further. It is also not clear what “pre-prepared foundations” are and what the potential impacts of using these would be. The EIA must include better definitions of the terminology used in order to be able to correctly assess the potential environmental impact.

2.5. For all three phase 2 test areas the frequency of deployment and retrieval operations in a 12-month period has been identified as up to 20 test deployments and retrieval operations in a 12-month period. In addition, the proposed project duration has been identified as 25 years. Due to the number of potential deployments and the size of the test areas it has to be assumed that a device with the maximum seabed footprint could be deployed anywhere within the mapped test area which could result in 20 different deployment locations over a year, multiplied over 25 years. This has implications when considering impacts to designated habitat features of Pembrokeshire Marine SAC. This is of particular importance for the Warrior Way and Dale Road test sites which fall within a number of Annex 1 habitat features including Estuaries, Large Shallow Inlets and Bays, and potentially subtidal Reefs.

2.6. We suggest that the potential for impacts under two different scenarios should be considered within the EIA/ES:
- Multiple deployments over the same area of seabed and cumulative impacts on the habitat over the length of the project
- Multiple deployments over different parts of the site with potentially shorter, but more extensive impacts over a wider area.

2.7. In light of this, we consider a more realistic scenario for Warrior Way and Dale Roads would be to define an area within the wider test area, no bigger than the

maximum footprint of two devices and moorings plus a buffer that could be utilised only for devices requiring seabed deployments of any kind. For other test deployments from floating platforms, vessels or existing moorings the wider test area could be utilised.

2.8. In order to determine the most suitable location within the wider test site, appropriate characterisation of the baseline environment is required in the EIA/ES. We recommend that multi-beam bathymetric surveys be conducted for each of the test sites, if suitable data is not available. This will allow identification of the broader habitats and help target areas where ground truthing (using drop down video or similar) can be used. The chosen area should present low sensitivities to the various impacts from the project as well as high resilience to habitat disturbance and temporary loss. Marlin's habitat sensitivity assessments[1] could be used for this purpose. We anticipate that by identifying smaller seabed deployment zones in the wider area that it would limit the amount of impact to the sensitive Annex 1 habitats in the Milford Haven Waterway.

2.9. The Warrior Way and Dale Roads test area include potential energy generation and grid emulation systems but no “installation of permanent infrastructure”. Further information must be provided in the EIA on this aspect, including consideration of the potential environmental impacts that could arise from any temporary infrastructures.

2.10. Section 2.4, Warrior Way - It would be useful to have examples of the kind of scaled devices that could be deployed here. More information on the likely device types and deployment methods must be provided in the EIA/ES.

2.11. Figure 2-1 of the scoping report shows the proposed test area lying over the SSSI boundary for the Milford Haven Waterway SSSI. Subsequent Evidence report dated 15 March 2019 detailed that the Warrior Way site boundary has been refined and figure 1-2 shows the proposed test area adjacent to the SSSI. Impacts on the SSSI features must be considered within the EIA.

2.12. Table 2-1 of Scoping Report and table 1.1 of Evidence Report- From the details provided it is difficult to envisage the scale of the maximum scenario provided. For example, the maximum dimensions stated of 25m x 15m (375 m²) do not equate to either the sea area per device/component or the seabed footprint per device (both ≤ 200 m²). This therefore raises the question of what dimension the applicant is referring to. This must be clarified in the ES.

2.13. Section 1.3.1.2 Evidence Report dated 15 March 2019 details that the maximum number of devices that may be tested concurrently at Warrior Way and Dale Road has been reduced from two (as was stated in the Scoping Report) to a single device. However in East Pickard Bay it is stated that up to two activity tests could be occurring concurrently; the indicative footprint in Fig 2.1 shows a single area of 10,250m^2. Clarification must be provided in the ES as to whether both devices would be in the same footprint area or located further apart if this occurred. Habitat evidence for all areas likely to be impacted must be presented in the ES.

2.14. Table 2-1 - It is stated that a buffer area of seabed clearance of a 5m strip around the device footprint may be required. The ES must provide clarification of

[1] https://www.marlin.ac.uk/activity/habitats_report

why this would be needed. Any clearance of the seabed will widen the benthic footprint of the project and result in greater impact on seabed habitats.

2.15. Table 2-1 - the maximum scenario for the mooring attachment method states that a gravity base may be required at Warrior Way with a maximum area of 25 m². This does not appear to correspond to the maximum footprint described. This must be clarified in the ES.

3. Consenting

3.1. Section 3.2.1 - the policy considered in the EIA/ES must also include the Environment (Wales) Act 2016 and the requirements of this Act must be considered appropriately in the impact assessments.

3.2. The scoping report recognises and highlights the developing Welsh National Marine Plan (WNMP) and marine planning framework as key policy context and correctly identifies that the plan is not yet adopted. Once the plan has been adopted we must make decisions in accordance with the marine plan, unless relevant considerations indicate otherwise. In preparation for the adoption of the plan, we recommend that any EIA undertaken reviews the contents of the draft WNMP, and the EIA/ES considers how the project complies with the draft Policies, or the final policies once the plan is adopted.

3.3. Section 3.2.2 suggests that a separate Marine Licence application will be submitted for each of the three META phase 2 sites. It is unclear why separate licences are proposed and we would recommend that all three of the phase 2 sites are submitted on one marine licence application.

3.4. As set out in paragraph 1.2 above, there are other licences/consents that may be required for the project. The EIA/ES must include a full list of the licences/consents required for the project.

3.5. Page A-36 - The reference to the 2011 decommissioning guidance notes is welcomed. It should be noted that these guidance notes have recently been revised. The Offshore Renewable Decommissioning Guidance Notes for Industry (updated 2019) is now available on the GOV.UK website; https://www.gov.uk/government/publications/decommissioning-offshore-renewable-energy-installations The EIA/ES must consider the relevant sections of the updated guidance. We recommend that you discuss the decommissioning of the META site(s) with the Offshore Renewables Decommissioning Team in BEIS at the earliest opportunity to ensure you are aware of any new requirements affecting test centres and the offshore renewables sector more generally.

3.6. Page A-37 – the text relating to responsibility for EPS licences is incorrect. NRW has been responsible for administering EPS licences in inshore waters (within 12nm) since it was formed in 2013. In April 2018 NRW obtained responsibility for EPS licensing in the Welsh offshore area. Also, EPS licences are handled by the Species Licensing Team, not Marine Licensing Team. This should be corrected in the ES.

4. Approach to EIA

4.1. The ES must include:

- A description of the likely significant effects of the project, whether direct, indirect, secondary, cumulative, transboundary, short-term, medium-term,

long-term, permanent, temporary, positive and negative.

- A description of the methods used to make the assessment of the significant effects and difficulties encountered in compiling the information, and uncertainties involved.
- A description of measures to avoid, prevent, reduce or offset identified significant adverse effects, and proposed monitoring arrangements.
- A description of the expected significant adverse effects of the project on the environment resulting from the vulnerability of the project to risks of major accidents or disasters

4.2. Where possible, other environmental assessments should be coordinated with the EIA process. However, it is important to note that HRA and WFD (and any other assessment) are separate processes to the EIA.

4.3. The UK is due to leave the EU on 29 March 2019. –Regardless as to whether the UK leaves the EU with a deal or without a deal, all legal obligations relating to compliance with environmental licences/permits and legislation will continue to apply. NRW on behalf of Welsh Ministers will continue to issue licenses in line with our current practice.

5. Scope of the Assessment

5.1. The EIA/ES must consider the potential for impacts on other European States.

6. Technical Assessments

6.1. Coastal Processes

6.1.1. The description of the physical baseline environment within the three test areas is quite limited at present, as is the information on the future survey works proposed. More detailed information describing the baseline environment must be presented in the ES, informed by site-specific monitoring.

6.1.2. It would have been useful to include the recent multibeam bathymetry data within this scoping report in order to help inform the review of the project design envelope. We are aware that bathymetry data has been collected for East Pickard Bay but do not know the survey extent or the data products available. Similar coverage of bathymetry must also be included in the ES for both the Warrior Way and Dale Roads sites to better understand the benthic environment and inform micro siting of devices. This should be further supported by ground truthing of the areas with either drop-down video or grab samples. Without knowledge of this data we cannot advise whether the existing dataset will suffice.

6.1.3. Surveys should be undertaken in accordance with the following guidelines:

- Saunders, G., Bedford, G.S., Trendall, J.R., and Sotheran, I. (2011). Guidance on survey and monitoring in relation to marine renewables deployments in Scotland. Volume 5. Benthic Habitats. Unpublished draft report to Scottish Natural Heritage and Marine Scotland.[2]

6.1.4. We agree with the proposed approach to EIA which will draw upon desktop information combined with site specific data collection.

[2] https://tethys.pnnl.gov/sites/default/files/publications/SNH-2011-Volume-5.pdf

6.1.5. Section 6.1.5: Proposed approach to EIA it is stated in Paragraph 2 that: "Due to the relatively small scale of the devices and the temporary and short-term nature of the deployments at META it is anticipated that morphological beach response modelling will be required to support the EIA". We presume that this is supposed to read will not be required, and we are satisfied that beach response modelling will not be required.

6.1.6. Table 6-1: Operational phase impacts assessed in the EIA must also include change in the hydrodynamic regime as the result of tidal device installation at the Warrior Way test site.

6.1.7. Table 6.1 - Impact 8: Given that the proposed test areas are all within designated sites there is the potential for direct impacts on designated habitat features as well as sediment disturbance. For example, direct loss of habitat extent due to the footprint of a device or associated moorings. This must be assessed in the EIA/ES.

6.1.8. Table 6-2 - We suggest Coastal lagoons can be scoped out. This is because the features are not within or adjacent to any of the test areas and we do not consider there to be any impact pathways to these features.

6.1.9. The proposed marine energy test area will provide a useful opportunity for studying the impact of various device types on the surrounding environment and we would encourage you to explore opportunities for collaboration with device developers and universities to learn from the deployments to assist with better understanding impact pathways, to reduce uncertainty.

6.2. Benthic Subtidal and Intertidal Ecology

6.2.1. The description of the baseline environment within the three test areas is quite limited at present. More detailed information on the baseline environment must be presented in the ES.

6.2.2. Sections 5.1 and 6.2.3 - There is no proposal to undertake subtidal work for the EIA. This section also states that the "most up-to-date contemporary evidence (i.e. within the last 5 years)" will be used for the EIA. As there is little recent evidence and the existing data is at a broad resolution and does not cover the test sites in their entirety, site specific subtidal survey data is likely to be required. We recommend that this survey work includes multi-beam bathymetry of Dale Roads and Warrior Way with ground truthing of the areas with either drop-down video or grab samples. The survey work should characterise the test sites to identify the habitats potentially affected by the project, in particular for areas encompassing Annex I habitats (all of Warrior Way and Dale Roads, partial for East Pickard Bay). Up to date evidence must be presented in the ES.

6.2.3. Benthic surveys should be undertaken in accordance with the following guidelines:

- Saunders, G., Bedford, G.S., Trendall, J.R., and Sotheran, I. (2011). Guidance on survey and monitoring in relation to marine renewables deployments in Scotland. Volume 5. Benthic Habitats. Unpublished draft report to Scottish Natural Heritage and Marine Scotland.
- Hitchin, R., Turner, J.A., Verling, E. (2015) Epibiota remote monitoring

from digital imagery: Operational guidelines[3].

6.2.4. Evidence Report dated 15 March 2019 section 1.3.1.2 details that the East Pickford Bay site has been refined. It is unclear from the evidence report what has been refined. Based on the location of East Pickford Bay detailed within the Scoping Report dated 16 November 2018 we consider that the location of the East Pickard Bay test area should be amended. This is because it currently covers a large area that includes both circalittoral rock and mobile sand. In order to minimise the direct impact on designated (SAC) reef feature, which includes all circalittoral rock in the area, it would be beneficial to move the East Pickard Bay site to the South slightly to cover only areas of mobile sand substrate. This should be easily identified in the multibeam bathymetry as the boundary between rock and sand will be clear. The subtidal sand substrate in Freshwater West bay is not part of the subtidal sandbank SAC feature. It is unclear if these are the changes that have been proposed within the 'Evidence Report' however if these changes are made then we consider that further surveys of East Pickard Bay would not be required, because mobile sand is resilient to habitat disturbance and temporary loss of habitat; there would likely be a quick recovery of the habitats affected; and the habitat is not part of a SAC feature.

6.2.5. Milford Haven Port Authority (MHPA) undertake regular surveys of the Milford Haven waterway. MHPA may therefore have bathymetry data covering the Warrior Way and Dale Roads test sites that could be used to inform the EIA.

6.2.6. Milford Haven Waterway Environmental Surveillance Group (MHWESG) have previously commissioned a sediment profile imaging (SPI) survey of the Milford Haven Waterway (Germano, 2012[4]) which provides a detailed map of sedimentary habitats. The study is the most comprehensive assessment of sediment distribution and benthic habitat composition available for the Milford Haven Waterway. For access to the data contact the MHWESG directly.

6.2.7. Section 6.1.4 – Sea caves and Atlantic Salt-Meadows are also Annex I habitat features of the SAC. Please see NRW's 'Regulation 37 Advice' document[5] for this SAC for further information.

6.2.8. Table 6-3 There is not enough information at this stage to not include Atlantic Salt-Meadow feature within the EIA feature scoping. This must be included in the EIA/ES.

6.2.9. Table 6-3 - Dwarf eelgrass must be included for the Milford Haven Waterway SSSI as this habitat is found throughout the Milford Haven and there is not enough information at this stage to scope this feature out of the EIA.

6.2.10. The following impact pathways must be assessed in the EIA/ES:

- Loss of habitat (not just disturbance). This is especially important for sensitive habitats with low resilience and recoverability;
- Impacts from repeated device deposits and removals, including the repeated loss and disturbance of habitat;
- Cable impacts such as cable burial and protective measures (armouring, clam shell weights);
- Effects of accidental pollutants;
- Repeated vessel mooring and anchorage.

6.2.11. Research and monitoring carried out on other marine renewable energy developments should be reviewed and utilised in the assessments where appropriate. This may identify potential impact pathways which have not yet been identified.

6.2.12. We draw your attention to the HRA for the Draft Welsh National Marine Plan which was published in December 2017. This was unable to rule out Adverse Effect on Integrity for multiple SPA, SAC and Ramsar sites and features. These conclusions must be taken into account when screening relevant plans or projects under the Habitats Regulations that could have an in-combination effect on those sites and when considering cumulative and synergistic effects in the EIA.

6.3. Fish and Shellfish Ecology

6.3.1. Some fish species have not been included in the scoping report which are found in the Haven. However, the list of fish proposed for assessment in the EIA should be sufficient to provide a variety of fish species for which impacts can be evaluated against; these can act as proxies to other similar species. Should further literature reviews identify particular areas of importance for spawning or feeding of other species within the site areas that are not on the list, these fish species must be included within the assessment.

6.3.2. It is stated that operational testing could be "throughout the year (will not be seasonally restricted) and will not be restricted to daylight hours". Some species could be vulnerable to turbine movements, and this must be considered in the EIA/ES. For example, herring migrating to spawning grounds further up the Haven in early spring could be vulnerable to turbine passage.

6.3.3. Section 6.3.3 - The section on shellfish is not entirely accurate. There are no current permits for carpet clams, razor or native oyster fisheries. Oysters were historically widespread in the Haven but are now depleted and there is no current oyster dredge fishery in the Haven. There are however still important oyster bed habitats within the Haven which have high sensitivity to certain benthic impacts such as disturbance and habitat loss.

6.3.4. Table 6-6 includes some of the species found within the Waterway and identifies those of primary conservation importance. Seahorses must also be considered as they are Schedule 5 species under the Wildlife and Countryside Act, with *Hippocampus guttulatus* recorded in the Milford Haven.

6.3.5. Basking sharks have been included in the marine mammals chapter of the scoping report rather than fish ecology. Basking sharks should be considered in the fish ecology chapter of the EIA/ES.

6.3.6. Section 6.3.5 - The same impacts identified within the benthic section (Table 6-4) must be assessed in the EIA/ES for shellfish.

6.3.7. We disagree with scoping out all operational effects on fish (table 6-8). There is not enough information at this stage on types of device or worst-case

[3] http://www.nmbaqcs.org/media/1591/epibiota_operational_guidelines_final.pdf
[4] Germano (2012) Sediment Profile Imaging Survey of Milford Haven Waterway, Wales, UK (request report and data from Milford Haven Waterway Environmental Surveillance Group)
[5] https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/find-protected-areas-of-land-and-seas/conservation-advice-for-european-marine-sites/?lang=en

scenario proposed to scope out impacts 2,3,4 and 5. Impacts from the operation of the turbines must be included for fish species and this must include assessment of disturbance, injury and mortality.

6.3.8. Injury and mortality impacts from wave devices must be considered in the EIA/ES. It is acknowledged that the majority of wave devices present little concern for impacts on fish, however, some devices have the potential for fish ingress within the device. Other unforeseen impacts may also occur. A review of existing wave devices would help to identify potential other impacts which may be relevant to the EIA.

6.3.9. The fish ecology section of the scoping report states that potential effects of marine noise on fish and shellfish are proposed to be scoped out of the EIA on the basis that the installation, operation, maintenance and decommissioning of marine renewable devices will result in noise levels lower than ambient noise levels experienced within study area. This does not correspond with the underwater noise section of the Scoping Report (Section 6.7) which presents a proposed approach to assessing the effects of the installation and operation of devices on fish and benthic ecology. The potential effects of noise on fish and shellfish must be assessed in the EIA (see comments in section 6.7 of this scoping opinion).

6.3.10. The assessment of underwater noise and vibration on fish receptors must consider the potential for disturbance, avoidance and barrier effect impacts.

6.4. Marine Mammals

6.4.1. We generally agree with the species identified within the scoping report as present within the area, and the relative importance of these species. However, the baseline description fails to note that the study area overlaps with the largest and most important breeding colony of Grey seals in the Celtic & Irish sea. This must be addressed in the ES.

6.4.2. The following data sources should be considered in the assessment of marine mammals:

- Bottlenose Dolphin Monitoring in Cardigan Bay 2014 - 2016, NRW Evidence Report No: 191[6]
- Skomer MCZ Grey Seal Survey[7]
- Grey seal breeding census Skomer Island[8]
- The identification of discrete and persistent areas of relatively high harbour porpoise density in the wider UK marine area, JNCC Report No.544[9].

[6] • Lohrengel, K., Evans, P.G.H., Lindenbaum, C.P., Morris, C.W., Stringell, T.B. (2018) Bottlenose Dolphin Monitoring in Cardigan Bay 2014 - 2016, NRW Evidence Report No: 191, 162pp, Natural Resources Wales, Bangor. [Soon to be available on NRW website - available on request from NRW]

[7] https://cdn.naturalresources.wales/media/686245/eng-report-195-skomer-mcz-grey-seal-survey-marloes-peninsula-1992-2016.pdf

[8] https://cdn.naturalresources.wales/media/687317/eng-evidence-report-252-grey-seal-breeding-census-skomer-island-2016.pdf

[9] • Heinänen, S. & Skov, H 2015. The identification of discrete and persistent areas of relatively high harbour porpoise density in the wider UK marine area, JNCC Report No.544 JNCC, Peterborough.

- The use of harbour porpoise sightings data to inform the development of Special Areas of Conservation in UK waters, IAMMWG. 2015[10].
- Guidance to Inform Marine Mammal Site Characterisation Requirements at Wave and Tidal Stream Energy Sites in Wales. Report by Sea Mammal Research Unit (SMRU)[11].

6.4.3. Table 6-9 'Designated sites' has omitted Cardigan Bay SAC – this appears to be a typographical error as it does appear in the preceding list of sites for consideration.

6.4.4. Consideration must be given to all marine mammal SACs within the relevant management unit. While most sites have been included in the assessment, for completeness the assessment should also list North Anglesey Marine SAC. Potential impacts should be considered on harbour porpoise from all 3 SACs within the management unit.

6.4.5. Potential disturbance effects on marine mammals as a result of increased underwater noise due to vessels involved in installation, operation and maintenance activities are proposed to be scoped into the EIA. The proposed approach for further assessment is to determine the potential increase in baseline levels of vessel traffic during these activities and to undertake a desk-based review of the types of vessels to be utilised and the potential for noise disturbance. Given the likely scale and nature of vessel activity associated with the META Project, this proposed approach is considered appropriate.

6.4.6. The scoping report states that potential effects on marine mammals from the noise generated during the installation and decommissioning of devices are proposed to be scoped out of the EIA on the basis that the expected sound pressures levels of drilled piling (which are lower than expected from miscellaneous small vessels) are unlikely to result in injury to marine mammals. Potential effects on marine mammals during the operation of tidal turbines are also proposed to be scoped out on the basis that available data suggest the levels of noise generated by these devices is low and, in the context of existing high levels of baseline noise present within the Waterway, are unlikely to be a significant issue. This does not correspond with the underwater noise section of the Scoping Report (Section 6.7) which presents a proposed approach to assessing the effects of the installation and operation of devices on marine mammals. We disagree with the proposed scoping out of installation and decommissioning activities, and tidal turbines during the operational phase. The potential effects of noise on marine mammals during installation, operation and decommissioning must be assessed in the EIA (see comments in section 6.7). If geophysical surveys are proposed, then a noise impact of these activities should be considered.

6.4.7. Overall we are satisfied with the identification of impact pathways, and the

[10] IAMMWG. 2015. The use of harbour porpoise sightings data to inform the development of Special Areas of Conservation in UK waters. JNCC Report No. 565, JNCC Peterborough

[11] • Sparling, C.; Smith, K.; Benjamins, S.; Wilson, B.; Gordon, J.; Stringell, T.; Morris, C.; Hastie, G.; Thompson, D.; Pomeroy, P. (2015). Guidance to Inform Marine Mammal Site Characterisation Requirements at Wave and Tidal Stream Energy Sites in Wales. Report by Sea Mammal Research Unit (SMRU). pp 88 https://cdn.naturalresources.wales/media/686187/eng-report-082-guidance-marine-mammal-site-characterisation-for-wave-and-tidal-energy-sites.pdf

environmental features (marine mammals) that could potentially be affected. However, changes to hydrodynamics resulting in potential impairment of foraging opportunities for marine mammals must be included in the EIA/ES as an impact pathway. This should be informed by an assessment of coastal processes.

6.4.9. Table 6-10 Collision risk – Although a review of available evidence, and swept area of operational tidal turbines will allow a broad assessment of the likely risk of the project, it will not be possible to conduct a detailed collision risk assessment without data on local densities of marine mammals. However, given the small scale, and inshore location resulting in likely low level of risk from the project, we are satisfied that this level of detail is unlikely to be necessary.

6.4.10. Basking Shark should be assessed in the fish and shellfish ecology section of the ES, not the marine mammal chapter.

6.5. Marine Ornithology

6.5.1. The list of species and sites currently in scope for assessment is incomplete. The list of species and sites must be updated in the EIA/ES. This must include all sites for which the foraging range of their designated feature intersects the proposed site boundaries. For example, the following sites have been omitted and must be included in the EIA:

- Carmarthen Bay / Bae Caerfyrddin SPA (designated for wintering common scoter)
- Northern Cardigan Bay / Gogledd Bae Ceredigion (designated for wintering red-throated diver)
- Grassholm SSSI/SPA

6.5.2. The EIA/ES must establish the presence of vulnerable species of bird. All species of birds need to be considered as part of the screening process for the EIA (and HRA). Possible adverse impacts may be applied to a range of birds (including bird features of SSSIs and SPAs) both breeding and non-breeding populations over a wide area of search; to include seabird features within their mean maximum foraging ranges.

6.5.3. The scoping area for the EIA should be denoted by mean-maximum foraging ranges from seabird SSSIs and SPAs. Thaxter et al (2012) initially set the standard of mean-maximum foraging ranges based on seabird tracking data. However, further tracking data has become available, in particular from the Future of the Atlantic Marine Environment (FAME) and Seabird Tracking and Research (STAR) projects. Seabird biotelemetry is a fast moving field and the EIA should consider data that becomes available on foraging range throughout the timespan of the assessment. See footnote for some seabird tracking data that is available from RSPB[12].

6.5.4. It is noted that 1 year of site specific ornithology surveys are planned to be undertaken (section 5.1). The nature of the surveys proposed are not clear, but

[12] https://rspb.maps.arcgis.com/apps/Cascade/index.html?appid=d6c3aa1ec7184a2895a01cebf451c7b3&utm_source=rspb.org.ukseabirdtracking&utm_medium=shorturl

we anticipate that one year of surveys should be sufficient to inform the EIA. It should be noted that further operational surveys may be required in future if deemed appropriate following review of the survey data and additional information.

6.5.5. The EIA must identify the extent of the offshore test sites and provide a defined site boundary and appropriate buffer as a basis for undertaking baseline surveys.

6.5.6. Owing to the distance of the test sites (including the application buffers) from the shore, boat based or aerial surveys may be required, in accordance with Guidance on Survey and Monitoring in Relation to Marine Renewables Deployments in Scotland Volume 4: Birds (Scottish Natural Heritage, 2011).

6.5.7. To assess the potential impacts of the scheme on ornithology the surveys must take account of all the ancillary components of the project. These may include the cable landfall, access tracks, control station, construction compounds, or other structures required by the scheme.

6.5.8. In addition to bird surveys, a desk study should be completed. On the whole, the data sources proposed to be used appear reasonable. The following data sources should be considered in the EIA:

- Historical at sea surveys for birds such as the ESAS and WWT combined seabird data for Welsh waters;
- BirdTrack data;
- Bird data from the Pembrokeshire county recorder[13]
- Terrestrial bird data for the general vicinity, including chough data is available from the RSPB.

6.5.9. Possible adverse impacts have been identified for a range of wildlife. However, impacts associated with floating wind devices have been overlooked in relation to barrier effect and collision risk for birds. Operational risks may need further consideration through robust modelling. Guidance is available from SNH.

6.5.10. Potential disturbance effects on seabirds as a result of increased underwater noise due to vessels involved in installation, operation and maintenance activities are proposed to be scoped into the EIA. The proposed approach for further assessment is to determine the potential increase in baseline levels of vessel traffic during these activities and to undertake a desk based review of the types of vessels to be utilised and the potential for noise disturbance. Considering the scale and nature of the proposed activities, the proposed approach is considered appropriate.

6.5.11. The proposed cumulative impact assessment (CIA) appears to be limited to direct impacts within the near vicinity and it lacks a list of potential projects and plans for consideration. The CIA must consider all relevant plans and projects – see paragraphs 0.3 and 0.4 of this scoping opinion for plans/projects to be considered and suggested information sources for identifying other relevant projects.

6.6. Onshore Ecology

[13] https://birdsin.wales/counties/pembroke/

6.6.1. Table 1.11 of the Evidence Report dated 15 March 2019 proposes that onshore ecology can be scoped out. We disagree that the onshore/terrestrial impacts can be scoped out of the EIA/ES. We consider that the onshore works and infrastructure are part of the same project as the offshore development and offshore cable and therefore must be considered within the EIA/ES.

6.6.2. In reference to section 6.6 of the scoping report; A lack of terrestrial surveys has been undertaken to support the proposals; for example, no ecological walkovers have been completed, and further surveys are not proposed. Without knowing the species and habitats that are present it is not possible to undertake a meaningful impact assessment. An appropriate baseline must be established in the EIA/ES for onshore ecology.

6.6.3. The proposed location of the terrestrial elements may fall within the Freshwater West (North) Geological Conservation Review Site, the Pembrokeshire Marine SAC, Castlemartin Coast SPA or Broomhill Burrows SSSI. Ecological surveys are required to inform the assessment of potential impacts on these sites. An assessment of the potential impact on these sites must be presented in the ES.

6.6.4. There is insufficient survey work to assess which habitats, species and features are present and thus identify potential cumulative impacts. Further surveys and assessments are required to identify cumulative impacts.

6.7. Underwater Noise

6.7.1. The underwater noise assessment must follow the latest guiding principles for assessing the impact of underwater noise[14]. This includes applying an appropriate acoustic model, and relevant noise sources and model input data[15]. The limitations and constraints of any approach must be clearly set out. The acoustic thresholds that are referenced in the Scoping Report consider potential injury effects only and there is a need to consider available published criteria or indicators of behavioural responses in marine mammals[16] and fish[17].

6.7.2. The underwater noise assessment must include a desk-based review of the latest available scientific evidence of the observed responses of marine fauna (fish, marine mammals and benthic invertebrates) to different types of underwater sounds for context. Although scientific research on the potential effects of underwater noise on invertebrates is relatively underdeveloped[18], there is increasing evidence to suggest that invertebrates are sensitive to noise, in particular particle motion[19],[20],[21].

6.7.3. The Scoping Report states that the cumulative impacts of the META Project with the MOD firing range located to the south of East Pickard Bay will be considered as part of the underwater noise assessment and fed into the EIA topic specific Chapters, including Fish and Shellfish, and Marine Mammals. The potential cumulative underwater noise effects from other activities (e.g. shipping) and projects that might generate underwater noise must also be considered as part of the EIA.

6.7.4. The potential for transboundary impacts has not been considered in the Scoping Report. The nearest other Member State to the META Sites is the Republic of Ireland. We consider that it is unlikely that there will be any transboundary effects in relation to marine noise given the scale and nature of the activities proposed at the Phase 2 sites. The potential for cross-border impacts with England is also considered unlikely.

6.8. Onshore Noise and Vibration

6.8.1. Table 1.11 of the Evidence Report dated 15 March 2019 proposes that onshore noise and vibration can be scoped out. We disagree that the onshore/terrestrial impacts can be scoped out of the EIA/ES. We consider that the onshore works and infrastructure are part of the same project as the offshore development and offshore cable and therefore must be considered within the EIA/ES.

6.8.2. No comments were received from consultees in relation to onshore noise and vibration detailed within the Scoping Report dated November 2018 and we have no comment to make on this section of the report. The ES should however include an assessment of impacts on onshore noise and vibration, as set out in the scoping report.

6.9. Commercial Fisheries

6.9.1. No comments were received from consultees in relation to commercial fisheries and we have no comment to make on this section of the report. The ES should however include an assessment of impacts on commercial fisheries, as set out in the scoping report.

6.10. Shipping and Navigation

6.10.1. We agree that navigation should be scoped into the EIA and recommend engagement with the MCA, UKHO and Trinity House. The navigational assessment should use sources such as IMO routeing measures, Trinity House AIS Data, UKHO charts and aids to navigation.

[14] Faulkner, R.C., Farcas, A., Merchant, N.D. (2018). Guiding principles for assessing the impact of underwater noise. Journal of Applied Ecology: 1-6.
[15] NPL (2014). Good Practice Guide for Underwater Noise Measurement, National Measurement Office, Marine Scotland, The Crown Estate, Robinson, S.P., Lepper, P. A. and Hazelwood, R.A., NPL Good Practice Guide No. 133, ISSN: 1368-6550, 2014.
[16] Southall, B. L., Bowles, A. E., Ellison, W. T., Finneran, J. J., Gentry, R. L., Greene Jr, C. R., Kastak, D., Miller, J.H., Nachigall, P.E., Richardson, W,.J., Thomas, J.A and Tyack, P.L. (2007). Marine mammal noise exposure criteria: initial scientific recommendations. Aquatic Mammals 33: 411–521.
[17] Hawkins, A.D., Roberts, L., Cheesman, S. (2014). Responses of free-living coastal pelagic fish to impulsive sounds. The Journal of the Acoustical Society of America, 135.
[18] Hawkins, A. D., Pembroke, A., and Popper, A. 2015. Information gaps in understanding the effects of noise on fishes and invertebrates. Reviews in Fish Biology and Fisheries, 25: 39–64.

[19] Roberts, L., Hardig, H.R., Voellmy, I., Bruintjes, R., Simpson, S.D., Radford, A.N., Breithaupt, T., and Elliott M., 2016. Exposure of benthic invertebrates to sediment vibration: From laboratory experiments to outdoor simulated pile-driving. Proc. Mtgs. Acoust. 27. Available from: https://doi.org/10.1121/2.0000324
[20] Spiga, I., Caldwell, G.S., and Bruintjes, R., 2016. Influence of Pile Driving on the Clearance Rate of the Blue Mussel, Mytilus edulis (L.). Proc. Mtgs. Acoust. 27. Available at: https://doi.org/10.1121/2.0000277
[21] Tidau, S., and M. Briffa, 2016. Review on behavioral impacts of aquatic noise on crustaceans. Proc. Mtgs. Acoust. 27. Available at: http://dx.doi.org/10.1121/2.0000302

6.10.2. The EIA/ES must assess potential impacts on navigational issues for both commercial and recreational craft, covering:

- Collision Risk
- Navigational Safety
- Visual intrusion and noise
- Risk Management and Emergency response
- Marking and lighting of site and information to mariners
- Effect on small craft navigational and communication equipment
- The risk to drifting recreational craft in adverse weather or tidal conditions
- The likely squeeze of small craft into the routes of larger commercial vessels.

6.10.3. A Navigational Risk Assessment (NRA) must be submitted in accordance with MGN 543 and the MCA Methodology for Assessing the Marine Navigational Safety & Emergency Response Risks of Offshore Renewable Energy Installations.

6.10.4. The shipping and navigation study must include radar and manual observations in addition to AIS data to ensure vessels of less than 300gt are captured. MGN 543 requires that traffic studies should be completed within 24 months prior to the ES submission or a new traffic study should be undertaken.

6.10.5. The cumulative and in combination effects on shipping routes must be assessed taking into account the proximity to other activity or proposed developments in the area.

6.10.6. The NRA must relate to a safe Under Keel Clearance (UKC), which should address the maximum drafts of vessel both observed and anticipated, from which a realistic UKC assessment should be undertaken. Further guidance is available on the MCA website[22].

6.10.7. The mooring arrangements for floating devices must be carried out in accordance with the MCA and HSE Guidance 'Regulatory expectations on moorings for floating wind and marine devices', which also include Third Party Verification (see link in MCA website in footnote for further information).

6.10.8. Particular attention should be paid to cabling routes and where appropriate burial depth for which a Burial Protection Index study should be completed and, subject to the traffic volumes, an anchor penetration study may be necessary. If cable protection is required e.g. rock bags, concrete mattresses, a 5% reduction in surrounding depths referenced to Chart Datum is generally acceptable. This will be particularly relevant where depths are decreasing towards shore and potential impacts on navigable water increase.

6.10.9. Any application for safety zones will need to be carefully assessed and additionally supported by experience from the development and construction stages.

6.10.10. Particular consideration must be given to the implications of the site size and location on SAR resources and Emergency Response Co-operation Plans (ERCoP). Attention should be paid to the level of radar surveillance, AIS and shore-based VHF radio coverage and give due consideration for appropriate mitigation.

[22] https://www.gov.uk/guidance/offshore-renewable-energy-installations-impact-on-shipping

6.10.11. MGN 543 Annex 2 requires that hydrographic surveys fulfil the requirements of the International Hydrographic Organisation (IHO) Order 1a standard, with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager and the UK Hydrographic Office. Failure to report the survey or conduct it to Order 1a might invalidate the Navigational Risk Assessment if it was deemed not fit for purpose.

6.10.12. We support that buoys, other navigational features, Navigation Risk Assessment and Notices to Mariners should be used and that all measures will be taken to keep the risk of any obstruction/ obstacle to navigation and risk of collision as low as possible.

6.10.13. Potential impacts on cruising routes must be assessed in the EIA, particularly as regards East Pickard Bay.

6.11. Historic Environment

6.11.1. Table 1.11 of the Evidence Report dated 15 March 2019 proposes that the terrestrial historical environment can be scoped out. We disagree that the onshore/terrestrial impacts can be scoped out of the EIA/ES. We consider that the onshore works and infrastructure are part of the same project as the offshore development and offshore cable and therefore must be considered within the EIA/ES. In addition, the impact on the offshore works on the setting of onshore heritage assets must be considered where relevant.

6.11.2. As Warrior Way (Site 6) and Dale Roads (Site 7) will not have any terrestrial components we agree that the Historic Environment (terrestrial archaeology) can be scoped out of the EIA for these areas.

6.11.3. The following designated heritage assets are located within 500m of East Pickard Bay (Site 8):

- Scheduled monuments
  - PE020 Devil's Quoit Burial Chamber
  - PE167 West Pickard Camp
  - PE494 Gravel Bay anti-aircraft battery
- Listed Buildings
  - 5954 Corse Bridge and attached Walled Channel
  - 16583 Seaweed Hut on foreshore
  - 17162 War Memorial
  - 17166 Rocket Cart House
  - 17167 Lookout Tower
- Historic Landscapes
  - HLW (D) 3 Milford Haven Waterway

6.11.4. These designated heritage assets have all been identified in the scoping report apart from scheduled monument PE167 West Pickard Camp which must also be included in the EIA. We consider that the proposed development is unlikely to directly affect any of the historic assets identified above but could have an impact on their settings. This potential impact must be assessed in the EIA/ES using the guidance given in the Welsh Government document "The Setting of Historic Assets in Wales".

6.11.5. The proposed development is outside the boundaries of the registered Milford Haven landscape of outstanding historic interest and it is unlikely that

given the scale of the proposed terrestrial works that it will have more than a local impact, at worst, on the registered historic landscape. Consequently, we consider that the impact of the proposed development on the registered historic landscape can be scoped out of the EIA.

6.11.6. The scoping report has identified that the proposed works could have an impact on undesignated heritage assets and proposes to assess the impact on these in a desk-based assessment carried out in accordance with the standards and guidance set by the Chartered Institute for Archaeologists. This would be an appropriate first stage of assessment for these assets, but further assessment may be required, including geophysical surveys and archaeological evaluation, in order to fully assess any impact on undesignated heritage assets.

6.12. Marine Archaeology

6.12.1. The scoping report has identified relevant data sources for marine archaeology in the vicinity of Sites 6, 7 and 8, and the approach to consider both the direct and indirect impact on the identified historic assets is appropriate. This work must be carried out to the standard outlined by the Chartered Institute for Archaeologists (CIfA)

6.12.2. The elements of the proposed developments that will be visible in the registered Milford Haven landscape of outstanding historic interest are anticipated to have no more than a local impact on the registered historic landscape. Consequently, NRW PS considers that the impact of the propose development on the registered historic landscape can be scoped out of the EIA.

6.13. Landscape, Seascape and Visual Impact Assessment

6.13.1. Table 1.11 of the Evidence Report dated 15 March 2019 proposes that impact on the onshore works on landscape and seascape can be scoped out of the ES. We disagree that the onshore/terrestrial impacts can be scoped out of the EIA/ES. We consider that the onshore works and infrastructure are part of the same project as the offshore development and offshore cable and therefore must be considered within the EIA/ES.

6.13.2. No comments were received from consultees in relation to Landscape, Seascape and Visual Impact Assessment and we have no comment to make on this section of the scoping report. The ES should however include an assessment of impacts on landscape, seascape and visual.

6.14. Socio-economic and Tourism

6.14.1. No comments were received from consultees in relation to socio economic and tourism and we have no comment to make on this section of the report. The ES should however include an assessment of impacts on socio-economic and tourism.

6.15. Other Users

6.15.1. The proposed development has been examined from a technical safeguarding aspect in relation to the management of en route air traffic, and does not conflict with NATS safeguarding criteria.

6.16. Traffic and Transport

6.16.1. Table 1.11 of the Evidence Report dated 15 March 2019 proposes that impact on traffic and transport can be scoped out of the ES. We disagree that the onshore/terrestrial impacts can be scoped out of the EIA/ES. We consider that the onshore works and infrastructure are part of the same project as the offshore development and offshore cable and therefore must be considered within the EIA/ES.

6.16.2. No comments were received from consultees in relation to traffic and transport and we have no comment to make on this section of the report. The ES should however include an assessment of traffic and transport impacts.

Yours sincerely

Peter Morrison
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Natural Resources Wales

MARINE ENERGY WALES

MARINE ENERGY TEST AREA (META)

Environmental Impact Assessment: Appendices

Appendix 4.3. - Overview of Main Points from META EIA Scoping Opinion

EOR0730

Marine Energy Test Area

Rev: 02

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Prepared by:

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Prepared for:

Marine Energy Wales

A.4.3.1. Overview of main points from META Scoping Opinion

A.4.3.1.1. Following the submission of a Scoping Report for the Marine Energy Test Areas (META) project on 16 November 2018, a Scoping Opinion was received on the 01 April 2019, dated the 28 March 2019, from Natural Resources Wales Permitting Service (NRW PS) and the Marine Management Organisation (MMO), detailing further information that should be included within the META project Environmental Statement.

A.4.3.1.2. This Appendix (Appendix 4.3: 'Overview of main points from the META Scoping Opinion') should be read in conjunction with the full Scoping Opinion (Appendix 4.2) provided by NRW PS and the MMO. The overview provided in this Appendix (Appendix 4.3) provides a succinct summary of points made by NRW PS and the MMO in the Scoping Opinion (28 March 2019). Each chapter (chapters 1-16) details the scoping opinion and consultation responses received relevant to each chapter, and how these have been considered by the Applicant within the assessment presented in each chapter. It is noted that since submitting the Scoping Report (16 November 2019), changes have been made to the META project description, in consultation with NRW PS (01 April 2019). NRW PS advised that the Scoping Opinion could be issued on the basis of these changes (all works associated with the Bombora Wave Energy project including temporary communications cable and onshore control station at East Pickard Bay (site 8)) are no longer within the scope of the META project.), and that the Scoping Opinion would be valid. All Scoping comments relating purely to the Bombora Wave Energy project have therefore not been considered further and are not reflected in the summary of main Scoping Opinion comments presented below.

Non-technical chapters

A.4.3.1.3. In considering the Scoping Report, NRW PS has consulted with various stakeholders and these are outlined on page four of the Scoping Opinion, and section 4.3.2 of chapter 4: Environmental Assessment Methodology.

A.4.3.1.4. Additional Cumulative Impact Assessment (CIA) projects to those listed in the META Scoping Report are advised to be assessed within the CIA section of each chapter within the META Environmental Statement.

A.4.3.1.5. The Non-Technical Summary (Scoping Opinion - section 1): NRW/MMO advise that consideration should be given to whether any other licences or consents are required. Corrections to reference to the Marine Works EIA regulation are provided and advised that these are referenced in the Environmental Statement.

A.4.3.1.6. Proposed development (Scoping Opinion - section 2): NRW/MMO highlights areas in the project description where detail is lacking and requests further clarification on aspects of the project description. Additional comments highlight perceived disparity in dimensions in the maximum and most likely Project Design Envelope tables with clarification sought. Furthermore, in order to determine the most suitable location within the wider test site for marine energy devices, further multi-beam bathymetric surveys should be conducted for each of the test sites. The chosen area should present low sensitivities to impacts caused by the project.

A.4.3.1.7. Consenting (Scoping Opinion - section 3): NRW/MMO states that the Environmental Statement must include a full list of the licences/consents required for the project. In addition, guidance pertaining to the decommissioning of the project is recommended (BEIS, 2019).

A.4.3.1.8. Approach to the EIA (Scoping Opinion - section 4): NRW/MMO provide the parameters that must be included/described in the Environmental Statement, such as a description of the likely significant effects of the project (e.g. direct, indirect, secondary, cumulative, transboundary, short-term, medium-term, long-term, permanent, temporary, positive and negative), methods used to undertake the assessment and difficulties/uncertainty encountered, mitigation and monitoring methods proposed to reduce significant adverse effects, and a description of expected adverse effect from the vulnerability of the project to risks of major accidents or disasters. An additional note is made to ensure that all legal obligations must be met regardless if the UK leaves the EU.

A.4.3.1.9. The assessment (Scoping Opinion - section 5): NRW/MMO advise that impacts on other EU states (transboundary impacts) are considered within each chapter of the Environmental Statement.

Technical Chapters

A.4.3.1.10. Coastal processes (section 6.1): NRW/MMO indicates that bathymetry surveys for all sites, following guidance provided, should be carried out to better understand the sites conditions. Additional impact, 'Impacts to international and nationally designated sites' should be scoped in and assessed within the Environmental Statement. NRW/MMO also highlight that the META project offers a useful opportunity to study the effects of marine devices on the surrounding environment and encourages collaboration with scientific bodies and device developers.

A.4.3.1.11. Benthic subtidal and intertidal ecology (Scoping Opinion - section 6.2): NRW/MMO highlights the requirement for more detail within the baseline of the Environmental Statement, and surveys may be required to better understand site ecology. The chapter should include salt-meadow features and seek further information from local surveillance groups. Additional impacts have been highlighted for inclusion within the Environmental Statement chapter.

A.4.3.1.12. Fish and shellfish ecology (Scoping Opinion - section 6.3): NRW/MMO highlight impacts relating to tidal turbines and operational phase impacts that should be included within the Environmental Statement. NRW are content that the fish species identified within the Scoping Report adequately characterises the variety of fish present within the Milford Haven Waters, however seahorse should also be considered as they are believed to be present. NRW/MMO advise that potential impacts of underwater noise on fish and shellfish should be scoped into the assessment.

A.4.3.1.13. Marine mammals (Scoping Opinion - section 6.4): NRW/MMO agree with the species identified for assessment and highlights further information for consideration. If this information is utilised in the assessment, no further survey is deemed necessary. They advise that underwater noise should be included for assessment.

A.4.3.1.14. Marine Ornithology (Scoping Opinion - section 6.5): NRW/MMO advise that the list of species and designated sites to assess should be updated to include all sites for which the foraging range of their designated feature intersects the proposed site boundaries. This includes Carmarthen Bay / Bae Caerfyrddin SPA (designated for wintering common scoter), Northern Cardigan Bay / Gogledd Bae Ceredigion SPA (designated for wintering red-throated diver), and Grassholm SSSI/SPA (designated for northern gannet).

A.4.3.1.15. NRW/MMO advise that one year of ornithology data collection may be required to inform the EIA and go on to advise that additional operational surveys may also be required.

A.4.3.1.16. Onshore Ecology (Scoping Opinion - 6.6): there are no longer any onshore works associated with the META project therefore no further consideration has been given to Scoping Opinion comments in relation to onshore ecology.

A.4.3.1.17. Underwater noise (Scoping Opinion - section 6.7): NRW/MMO advise that the assessment must follow the most up-to-date guiding principles in relation to noise modelling, noise sources and noise modelling input data. References are provided. Additionally, limitations and constraints of any approach must be set out. The MOD firing range should be considered within the CIA assessment.

A.4.3.1.18. Onshore Noise and Vibration (Scoping Opinion - section 6.8): there are no longer any onshore works associated with the META project therefore no further consideration has been given to Scoping Opinion comments in relation to Onshore Noise and Vibration.

A.4.3.1.19. Commercial fisheries (Scoping Opinion - 6.9): NRW/MMO advise that they received no comments from consultees on this topic, but that the Environmental Statement should follow the assessment set-out in the Scoping Report.

A.4.3.1.20. Shipping and navigation (Scoping Opinion - 6.10): NRW/MMO highlights sources of information and potential impacts for inclusion within the Environmental Statement. A Navigational Risk Assessment (NRA) must be submitted and include radar and manual observations as well as other requirements for inclusion with the assessment.

A.4.3.1.21. Historic Environment (Scoping Opinion - 6.11): there are no longer any onshore works associated with the META project therefore no further consideration has been given to Scoping Opinion comments in relation to Historic Environment.

A.4.3.1.22. Marine Archaeology (Scoping Opinion - section 6.12): NRW/MMO highlights that any works that may affect marine archaeology must be carried out to the standard outlined by the Chartered Institute for Archaeology.

A.4.3.1.23. Landscape, seascape and visual impact assessment (Scoping Opinion - section 6.13): onshore elements have been excluded from the Environmental Assessment therefore landscape is no longer within the scope of the META project, however potential impacts on seascape has been assessed within the Environmental Statement. No comments have been received pertaining to the seascape.

A.4.3.1.24. Socio-economic and tourism (Scoping Opinion - section 6.14): NRW/MMO note that they received no comments from consultees on this topic, but that the Environmental Statement should follow the assessment set-out in the Scoping Report.

A.4.3.1.25. Other users (Scoping Opinion - section 6.15): NRW/MMO state that this topic was examined from a technical safeguarding aspect and no conflicts with the NATS safeguarding criteria were found.

A.4.3.1.26. Traffic and transport (Scoping Opinion - section 6.16: there are no longer any onshore works associated with the META project therefore no further consideration has been given to Scoping Opinion comments in relation to onshore traffic and transport.