

# Offshore Environmental Management Plan (EMP)

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## 1. Introduction

### 1.1 Introduction

This Offshore Environmental Management Plan (EMP) has been prepared by GoBe Consultants Ltd to support North Irish Sea Array Windfarm Ltd's (hereafter referred to as 'The Developer') application for consent for the proposed North Irish Sea Array (NISA) Offshore Wind Farm (hereafter referred to as 'the proposed development').

The proposed development can be grouped into two main areas – offshore and onshore. Two separate plans have therefore been prepared on this basis:

- This Offshore EMP, which refers to all offshore elements of the proposed development; and
- A separate Onshore Construction Environmental Management Plan (CEMP), prepared by Arup, which refers to all onshore elements of the proposed development

This Offshore EMP provides information relating to the environmental management of all offshore works for the proposed development. This will form part of the offshore construction works Contract (hereafter, referred to as 'the Contract')(Figure 1). The methods and principles contained herein, as well as within referenced legislative instruments and published guidance documents, will be adhered to by the Contractor in developing construction method statements and other plans relating to environmental management as required by the Contract.

	WTG Package	Foundation Package	Electrical Transmission Package			
	Wind Turbines	Foundations	Array Cables	Export Cables	Offshore Substation	Onshore Package
Design		FOU Design	Inter-Array Cables Supply		Offshore Substation (including FOU)	FEED for Onshore package
Supply	Wind Turbines Supply	FOU Supply				Export Cables Supply & Offshore Installation
Install.		FOU Installation	T&I Inter-Array Cables			
Vessels	WTG Installation					

Figure 1 – Indicative EPC Contractor Set Up

This Offshore EMP presents minimum environmental management requirements to be adhered to by the Contractor during offshore construction works. This Offshore EMP will be updated following receipt of planning consent to incorporate relevant planning conditions and further details on environmental management measures to be applied during the construction period. The Offshore EMP will be a key construction contract document, which will ensure that all mitigation measures, which are considered necessary to protect the environment, are implemented.

This document will be implemented onsite in conjunction with industry good practice, published guidance documents, and other documents referred to within the Offshore EMP (refer to Section 10.3). It must also be considered in conjunction with the Onshore CEMP prepared for all onshore construction works, and with the Environmental Impact Assessment Report (EIAR) overall.

## 1.2 Purpose of this EMP

The purpose of this Offshore EMP is to document and describe the main activities that will be undertaken to facilitate the proposed development, and to provide a framework that outlines how the Developer will supervise, and any Contractor appointed by the Developer, will manage and implement the mitigation measures described in the EIAR and Natura Impact Statement (NIS), in order to seek to minimise negative environmental effects during the construction of the proposed development.

This document will be further developed by the appointed Contractor, within the parameters assessed in the application particulars, taking into account any conditions of the statutory Approval (which, it is anticipated, will include a requirement for agreement in the content of this Offshore EMP with the relevant planning authority – An Bord Pleanála (ABP)), the results of confirmatory surveys and any additional measures identified during the detailed design. This Offshore EMP will remain a ‘live’ document which will be reviewed regularly and revised as necessary and appropriate. Following completion of the construction phase, periodic inspection and maintenance works will be undertaken.

## 1.3 Structure of this EMP

This Offshore EMP has been structured as follows:

- Introduction describes the purpose of this Offshore EMP;
- Proposed Development Details describes the offshore elements of the proposed development and the offshore construction activities;
- Project Team describes the roles and responsibilities of the construction phase team;
- General Environmental Requirements describes the proposed construction activities;
- Schedule of Environmental Commitments describes the control measures that will be implemented;

- Training and Auditing describes the training and auditing protocols that will be implemented; and
- Communications and Complaints describes the communications and procedure for complaints; and
- Appendices containing management procedures as listed in Section 10.3.1.

#### 1.4 Associated Documents

The EMP is supported by a number of management procedures which focus on key aspects of the environmental management of the proposed development. Some of these documents are included in the EMP as annexes, whilst other stand-alone documents are appended separately to the EIAR. The other relevant documents are listed below:

- Marine Pollution Contingency Procedure (Appendix 1 of this document);
- Emergency Incident Response Procedure (Appendix 2 of this document);
- Marine Mammals Mitigation Protocol (Volume 9, Appendix 14.4);
- Invasive Non-Native Species Management Procedure (Appendix 3 of this document);
- Dropped Objects Procedure (Appendix 4 of this document);
- Waste Management Procedure (Appendix 5 of this document);
- Protocol for Archaeological Discoveries (Appendix 6 of this document);
- Offshore Decommissioning Strategy (Appendix 7 of this document);
- Environmental Vessel Management Plan (Volume 9, Appendix 14.5);
- Vessel Management Plan (Volume 9, Appendix 17.2);
- Fisheries Management and Mitigation Strategy (Volume 9, Appendix 16.2); and
- Lighting and Marking Procedure (Volume 9, Appendix 17.3).

#### 1.5 Updating this EMP

It is important to note that the EMP and the other relevant documents listed above will be developed further in preparation for construction in accordance with the conditions of any permission granted. This EMP will be updated prior to construction, during construction, and prior to commencement of the operational and maintenance phase to focus and detail key aspects of the relevant stages of the proposed development life cycle. Updates may also be required



following unscheduled events, for instance, major personnel or procedure change, or a major incident.

Updates will incorporate details on environmental management measures to be applied during the construction, operation, maintenance and decommissioning phases of the proposed development.

The EMP and associated documents capture the requirements of the EIAR to ensure that the associated environmental management measures are built into these plans, procedures and strategies from an early stage and brought forward into the further phases of construction and operation and maintenance. The commitments made in the EIAR and any associated conditions of consent or requirements agreed with the relevant authorities will always form the basis of these documents.

## 1.6 Scope

In line with requirements of consent conditions, and in line with industry standards and good practice, the EMP covers the following:

- The roles and responsibilities of key stakeholders with respect to environmental management;
- Communication with key stakeholders, including other marine users;
- Mechanisms for reporting environmental issues and EMP compliance to the relevant stakeholders and governments;
- Mitigation measures to prevent adverse impacts to environmental interests with reference to relevant measures detailed in each chapter and management procedure;
- Chemical usage measures;
- Measures to prevent non-native invasive species;
- Procedures for dealing with dropped objects;
- Pollution prevention and contingency measures; and
- Waste management measures.

## 1.7 Aims and Objectives

The principal objective of this document is to provide information on the proposed development and to detail appropriate measures for the avoidance, minimisation and control of adverse environmental impacts associated with the proposed development as identified in the EIAR.

The EMP will form part of the contracts for the construction and operation phases of the proposed development. The methods and principles contained herein will be adhered to by both the

Developer and Contractor personnel through implementation within construction method statements and other procedures relating to environmental management as required throughout construction, operational, and maintenance phases of the proposed development.

This version of the EMP presents minimum environmental management requirements to be adhered to by the Developer and all relevant contractors.

## 2. Proposed Development Details

The proposed development is a combination of offshore infrastructure and onshore infrastructure (refer to EIAR Volume 1, Chapter 1 Introduction).

For clarity, while the proposed development is assessed as a whole in the EIAR and NIS, the boundary between onshore and offshore infrastructure is the high-water mark (HWM) as defined by Ordnance Survey Ireland mapping. Figure 2 illustrates the offshore and onshore infrastructure of the proposed development and the interface between each.

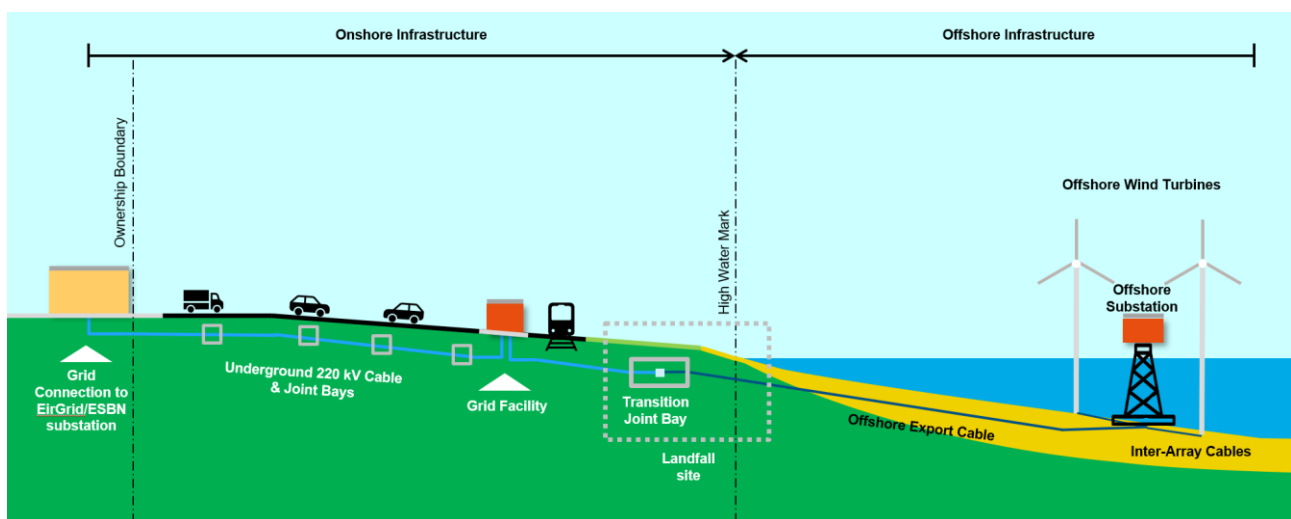


Figure 2 – Indicative Proposed Infrastructure of the proposed development (not to scale)

The offshore infrastructure will consist of the following:

- Array area: This is where the offshore wind farm will be located. This includes the wind turbine generators (WTGs), inter-array cables and the offshore station platform (OSP);
- Offshore Export Cable Corridor: This is where the offshore electrical infrastructure, consisting of 2 No. subsea offshore export cables that will be routed from the offshore station platform to landfall.

These elements are described in further detail in the Offshore Description Chapter and the Offshore Construction Chapter of the EIAR.

The Developer is including two Project Options for consideration within the planning application and in this EIAR to provide necessary flexibility. Further information on the requirement for

flexibility throughout the proposed development is included in Volume 2, Chapter 2: EIA Methodology. At detailed design post-consent stage, just one option will be chosen as the Preferred Option and subsequently constructed. An overview of the key parameters of the two Project Options are provided in Table 1. The design parameters for each of the two Project Options have been described per Project Option where they differ from each other.

Table 1 High Level Overview of the two Project Options for the proposed development.

Parameter	Project Option 1	Project Option 2
Number of WTGs	49	35
WTG tip height (m above lowest astronomical tide)	290	316 outside aviation restricted zone, 311 inside aviation restriction zone*
Rotor Diameter (m)	250	276
Foundation type	Monopiles	Monopiles or multi-leg pin piled jackets (hereafter referred to as 'jackets')
Number of OSPs	1	1
Offshore export cable length (km)	18	18
Inter-array cable length (km)	111	91

\*An aviation restriction zone has been identified by the Developer due to the partial overlap of the array area with a Dublin Airport Instrument Flight Procedure. This is further detailed in Volume 3, Chapter 19: Aviation and Radar.

### 3. Project Organisation and Responsibilities

This initial issue of the Offshore EMP identifies the key roles for the construction works. The contractor will update the Offshore EMP and will set out detailed roles and responsibilities (including named individuals) and an organogram of the team structure.

All Developer personnel, Contractors and Subcontractors will have a responsibility to comply with the requirements of the EMP and all relevant supporting documents. The key roles relevant to the delivery and implementation of the EMP are:

- The Employer;
- Employers Representative;
- Project Manager;
- Construction Manager;
- Design Engineer;
- Environmental Manager;

- Offshore Environmental Clerk of Works (ECoW);
- Fisheries Liaison Officer;
- Marine Coordinator; and
- Supporting Environmental Roles.

### 3.1 Employer

North Irish Sea Array Windfarm Ltd is the Employer (Developer) and has the following responsibilities:

- Post-consent, manages the process towards construction, including liaison with key environmental agencies and stakeholders.
- Undertakes a Client Engineering function, including inspections to ensure that detailed designs, plant, materials and works including scheduling meet the requirements of its construction programme, its functional specifications, its outline designs and its generic standards.
- Continued liaison with key stakeholders including, but not limited to, fishers, landowners and local residents, as required.

### 3.2 Employers Representative

The Employer will employ an independent Environmental Clerk of Works (ECoW) within the Employer's Representative Team to assess the construction of the proposed development and advise the Developer on the implementation of the agreed Offshore EMP. There will be a similar Onshore ECOW appointed as outlined in the CEMP. Further details on the Offshore ECoW is provided in Section 3.5 below.

In 2019, a community liaison officer (CLO) was appointed to begin building awareness of the project among local communities. Since then, the CLO and the wider project stakeholder management team has facilitated engagement with the local community and these role will continue for the duration of the proposed development.

### 3.3 Project Manager

The Project Manager will be responsible for the overall execution and organisation of all environmental related activities, as appropriate. Some of the principal duties and responsibilities of this role will include:

- Overall responsibility for the implementation of the Onshore CEMP and Offshore EMP;
- Allocating the correct resources and facilities in order to ensure the successful implementation of the Onshore CEMP, Offshore EMP; and

- Assist in the management review of the Onshore CEMP and Offshore EMP for suitability and effectiveness.

Prior to each stage of construction commencing, the contractors will prepare or update the management plans required within this Offshore EMP.

### 3.4 Construction Manager

The Construction Manager manages all the works to construct the offshore infrastructure, on behalf of the main contractor. The Construction Manager reports to the Project Manager. In relation to the Offshore EMP, the Construction Manager is responsible for:

#### 3.4.1 Site-Specific Method Statements

- Liaising with the Environmental Manager in preparing site-specific Method Statements for all Works activities where there is a risk of environmental damage, by incorporating relevant Environmental Control Measures and referring to relevant Environmental Control Measure Sheet
- Liaising with the Environmental Manager in reviewing and updating site-specific Method Statements for all Works activities where Environmental Control Measure and Environmental Control Sheets have been altered.
- Liaising with the Environmental Manager where third party agreement is required in relation to site-specific Method Statements, Environmental Control Measures and/or Environmental Control Measure Sheets.

#### 3.4.2 General

- Being aware of all project Environmental Commitments and Requirements.
- Ensuring that all relevant information on project programming, timing, construction methodology, etc., is communicated from the Project Manager to the Environmental Manager in a timely and efficient manner in order to allow pre-emptive actions relating to the environment to be taken where required.
- Ensuring that adequate resources are provided to design and install any environmental interventions.
- Liaising with the Design Engineer and providing information on environmental management to the Design Engineer during the course of the construction phase.
- Liaising with the Project Team in assigning duties and responsibilities in relation to the Offshore EMP to individual members of the main contractor's project staff.

### 3.5 Design Engineer

The Design Engineer is appointed by the Contractor for the works. The Design Engineer reports to the Project Manager and is responsible for:

- Design of the Works.

- Review and approval of relevant elements of the method statements - assisting the Construction Manager with the overall review.
- Overseeing geotechnical aspects of the Works (a geotechnical engineer may be used where required).
- Participating in Third Party Consultations.
- Liaising with Third Parties through the Environmental Manager.

### 3.6 Environmental Manager

An Environmental Manager with appropriate experience and expertise will be employed for the duration of the construction phase to ensure that all the environmental design, control and mitigation measures outlined in the Offshore EMP/EIAR & NIS and supporting planning documentation in relation to all aspects of the environment are implemented. The Environmental Manager will work collaboratively and in consultation with the Offshore ECoW, This Environmental Manager will be awarded a level of authority and will be allowed to stop construction activity if there is potential for adverse environmental effects to occur.

### 3.7 Offshore Environmental Clerk of Works (ECoW)

The Offshore Environmental Clerk of Works (ECoW) will have suitable environmental qualifications and the necessary experience and knowledge appropriate to the role. The ECoW will be delegated sufficient powers under the construction contract so that they will be able to instruct the Contractor to stop works and to direct the carrying out of emergency mitigation / clean-up operations.

The Offshore ECoW will be responsible for carrying out regular monitoring of the implementation of the Offshore EMP and will report monitoring findings as required by the planning consent. The Offshore ECoW will also report monitoring findings in writing to Developer on a regular basis (at least weekly, but immediately in the case of incidents or accidents).

The Offshore ECoW will also coordinate regularly with the Environmental Manager for implementing the Offshore EMP. Unless otherwise agreed between the ECoW, the Site Manager, the competent authorities, or other relevant stakeholders, co-ordination will be required at least weekly (but daily where onshore and offshore works are concurrent at the landfall).

### 3.8 Fisheries Liaison Officer (FLO)

The Developer has employed an FLO since 2019 for the proposed development. The FLO continues to have active engagement with the fishing industry and the key responsibilities of the FLO are outlined below:

- Provide advice to the Developer on fisheries liaison throughout the construction and operation of the proposed development;
- Communicate with the fishing industry, any contractors or sub-contractors, other developers and other users of the sea through appropriate channels;

- Provide information relating to the safe operation of fishing activity throughout the construction and operation of the proposed development;
- Develop and maintain a strong positive working relationship with the local fishing industry;
- Have and maintain a strong knowledge of the fishing industry local to the proposed development;
- Understand the interactions likely to occur between the local fishing industry and the proposed development, and any potential impacts on the fishing industry during construction and operation of the proposed development;
- Ensure that information is made available and circulated in a timely manner to minimise interference with fishing operations and other users of the sea; and
- Maintain availability to receive and respond to fisheries stakeholders and client enquiries, including resolution of fisheries related issues should they arise.

Further details on the wider Fisheries Liaison Team is provided in the Fisheries Mitigation and Monitoring Plan.

### 3.9 Marine Coordinator (MC)

The Marine Coordinator is responsible for supervising all offshore maritime operations. This includes planning and coordinating transportation and logistics activities necessary for the transportation of personnel, equipment, and supplies to offshore wind sites.

The Marine Coordinator will coordinate day-to-day vessel activity in the offshore development area by providing a logistical oversight. The Marine Coordinator will also act as a first point of contact for incident management and must ensure compliance with safety and environmental protection standards.

### 3.10 Supporting Environmental Specialists

The Contractor will be responsible for engaging suitably qualified and experienced professionals, including, where necessary, the following (i.e. depending on the scope of the contract) competent experts:

- Licensed offshore archaeologist;
- Marine mammal observer and PAM operator; and
- Unexploded ordnance (UXO) specialists.

The responsibilities of the experts may include the following, as relevant to their technical area:

- Ensure that all mitigation measures used to protect the environment are in place and are maintained during the works;
- Undertaking and reporting on weekly monitoring and undertaking weekly site inspections;
- Revising the mitigation measures if the monitoring evidence indicates that the measure is not effectively protecting the environment;
- Supervising of any excavation (such as archaeologist), as required;
- Undertaking surveys and monitoring as required;
- Provide toolbox talks to all sub-contractors before they start on site; and
- Carry out surveys and monitoring as detailed in the Offshore EMP, the EIAR and NIS.

## 4. General Environmental Requirements

### 4.1 Introduction

This section outlines the general environmental requirements, measures and controls to be in place during the Offshore construction phase of the proposed development to avoid, reduce or mitigate for adverse effects.

The relevant Contractor will ensure that all sub-contractors adhere to the guidelines set by the Offshore EMP for implementation during work activities.

### 4.2 Method Statements

The implementation of Method Statements for the different activities of the proposed development works shall be completed by the relevant contractor(s) by trained staff or other appropriate experienced personnel, in consultation with specialists as required. Their production shall include a review of the environmental / health and safety risks and commitments, so that appropriate control measures are developed and included within the construction process.

Method Statements will be reviewed by the Developer, Contractor's Project Manager and, where necessary, by an appropriate environmental specialist. Where appropriate, and if required or necessary, Method Statements will be submitted to the relevant regulatory authorities.

Method Statements must contain as a minimum:

- Location and duration of the activity;
- Work to be undertaken and methods of construction;
- Plant and materials to be used;



- Labour and supervision requirements;
- Health, safety, and environmental considerations (including relevant control measures); and
- Permit or consent requirements.

## 5. Schedule of Environmental Commitments

The following sections present the mitigation measures that have been identified within the EIAR and are provided as a schedule of environmental commitments for the proposed development.

### 5.1 Marine Geology, Oceanography and Physical Processes

#### 5.1.1 Embedded Mitigation Measures

The design development process for the proposed offshore development has included a reduction in the overall array area which has a potential beneficial reduction to impacts on marine processes receptors.

#### 5.1.2 Mitigation and Monitoring Measures

Throughout the development stage, the design of the proposed development has evolved such that no additional mitigation or monitoring measures are considered necessary during the construction, operation and decommissioning phases additional to standard asset monitoring already planned for over the operational period, as outlined in Chapter 6.

### 5.2 Marine Water and Sediment Quality

#### 5.2.1 Embedded Mitigation Measures

Table.1: Embedded mitigation measures for marine water and sediment quality

Measure	Mitigation detail
<b>Construction</b>	
Cable design	HDD of cables will be undertaken in the intertidal zone, thus avoiding direct sediment disturbance in the intertidal zone and minimising increases in suspended sediment. Export and inter-array cables will be buried where practically possible to avoid the requirement for protection measures. The design development process for the proposed offshore development has included a reduction in the overall array area, which has a potential beneficial reduction to impacts on marine physical processes receptors (see the Physical Processes chapter).
Cable specification and installation measures	Development of a detailed CBRA to enable informed judgements regarding burial depth to maximise the chance of cables remaining buried whilst limiting the amount of sediment disturbance to that which is necessary.
Pollution prevention	Marine pollution contingency measures will be implemented as part of Volume 9, Appendix 6.1: Offshore Environmental Management Plan (EMP) to manage the risk of accidental

Measure	Mitigation detail
design measures	<p>spillages from construction equipment or collision incidents. This will include a chemical risk review with information regarding how and when chemicals are to be used, stored and transported in accordance with recognised best practice guidance.</p> <p>Typical measures will include:</p> <ul style="list-style-type: none"> <li>▪ storage of all chemicals in secure designated areas with impermeable bunding (generally to 110% of the volume); and</li> <li>▪ double skinning of pipes and tanks containing hazardous materials.</li> </ul> <p>This measure would reduce the likelihood of potentially harmful pollutants to be released into the marine environment and ensure that potential for contaminant release is strictly controlled.</p>
Pollution prevention management and best practice measures	<p>The Offshore EMP includes Marine Pollution Contingency elements and incorporates procedures to cover accidental spills, potential contaminant release and include key emergency contact details (e.g. Marine Survey Office (MSO), Commissioners for Irish Lights (CIL) and Irish Coast Guard (IRCG) and the proposed development site coordinator). Guidance for Pollution Prevention 5 (GPP5): Works and maintenance in or near water has been used to inform the development of the Offshore EMP.</p> <p>Measures to ensure safe passage of vessels and avoid collision are also captured within Appendix 17.2: Vessel Management Plan (VMP).</p>
Disposal of waste management	<p>The developer commits to the disposal of sewage and other waste in a manner which complies with all regulatory requirements, including but not limited to the International Maritime Organization (IMO) International Convention for the Prevention of Pollution from Ships (MARPOL) requirements.</p>
<b>Operation</b>	
Scour protection and cable protection measures	<p>Development of a Scour Protection and Cable Protection strategy which sets out the details of the protection where there is the potential for scour to develop around wind farm infrastructure, including turbine and substation/ platform foundations and cables. This will be included within the Offshore EMP once the site condition information is available following the detailed site investigation surveys.</p>
Scour protection of other infrastructure	<p>In areas where there is potential for scour pits to develop around the foundations of structure, there is potential for release of sediment and concurrent sediment-bound contaminants into the water column. Therefore, in areas where there is potential for scour pits to occur scour protection will be implemented removing the potential for scour development.</p>
<b>Decommissioning</b>	
Removal of infrastructure	<p>Infrastructure above seabed level will be removed and foundations cut to approximately 1 to 2m below seabed level and it is anticipated that cables, cable protection and scour protection will remain in-situ and there will be secure burial of export cables in the intertidal area. These measures will reduce the potential for seabed disturbance and thus increased suspended sediment concentrations and the release of sediment-bound contaminants. This will be managed as part of the decommissioning strategy within the Offshore EMP.</p>
Assessment of impacts and best practice environmental management	<p>Prior to decommissioning a study of the potential environmental impacts to benthic ecology receptors from the proposed decommissioning activities will be undertaken, considering the baseline environment at the pre-decommissioning stage. All mitigation measures to be captured will be captured within the Rehabilitation Schedule and decommissioning strategy within the Offshore EMP. Any licences or authorisations that might be required will be identified and obtained prior to decommissioning, including any validation, updating or new submission of an EIAR, as required.</p>

## 5.2.2 Mitigation and Monitoring Measures

Mitigation measures that were identified and adopted as part of the evolution of the proposed development design (embedded into the proposed development design) and that are relevant to MW&SQ are listed in Table 9.1. No additional mitigation or monitoring measures are considered necessary for the construction, operation and decommissioning phases specific to the potential impacts on marine water and sediment quality.

## 5.3 Benthic Subtidal and Intertidal Ecology

### 5.3.1 Embedded Mitigation Measures

Table.2: Embedded mitigation measures in relation to benthic subtidal and intertidal ecology

Measure	Mitigation detail
Construction	
Cable installation measures/Cable Burial Risk Assessment	Cable installation measures will seek to minimise adverse impacts to potentially sensitive receptors. It will also set out appropriate cable burial depth in accordance with industry good practice, reducing the risk of cable exposure and based on a cable burial risk assessment. Cables will be buried to a sufficient depth to ensure that they are not exposed by sandwave movements. Where target cable burial depth cannot be achieved during the cable installation process (for any of inter-array, interconnector or export cables), cable armouring will be implemented (e.g. mattresses, or rock placement etc). The suitability of installing rock or mattresses for cable protection will be investigated, based on (inter alia) the seabed current data at the location of interest and a risk assessment of the potential for cable damage to occur. Cable installation measures are captured in the Offshore Environmental Management Plan (EMP)
Cable burial	Cable installation will follow the burial hierarchy, where practicable two attempts will be made to bury cables before cable protection is used.
Landfall	The installation of the offshore export cables at landfall will be undertaken by HDD beneath the intertidal zone which will prevent any direct disturbance to intertidal receptors. The HDD exit pits will be located within the ECC seaward of the LWM at a point where cable installation vessels can operate.
Project Design	Presence of sensitive habitats will be identified through a review of the latest available benthic datasets and pre-construction surveys. Proposed development infrastructure will avoid protected habitats wherever reasonably practicable to an extent not resulting in a hazard for marine traffic and Search & Rescue capability.
Offshore Environmental Management Plan (EMP) <b>(this document)</b>	An Offshore EMP has been developed and will include details of: <ul style="list-style-type: none"> <li>Marine pollution contingency measures to address the risks, methods and procedures to deal with any spills and collision incidents of the authorised project in relation to all activities carried out below the HWM;</li> <li>A chemical risk review to include information regarding how and when chemicals are to be used, stored and transported in accordance with recognised best practice guidance;</li> </ul>

Measure	Mitigation detail
	<ul style="list-style-type: none"> <li>• Marine biosecurity measures detailing how the risk of introduction and spread of invasive non-native species will be minimised;</li> <li>• Waste management and disposal arrangements;</li> <li>• A VMP, to determine vessel routing to and from construction sites and ports, to include a code of conduct for vessel operators; and</li> <li>• The appointment and responsibilities of a company fisheries liaison officer.</li> </ul>
Pre-construction profile survey	Where necessary, before works commence and following reinstatement, a topographical survey of the nearshore subtidal area will be carried out to identify and map the contours of the subtidal HDD exit pit to ensure a profile similar in nature to the profile recorded during the pre-construction survey is reinstated, as far as practicable.
<b>Operation</b>	
EMF and cable protection	Where practicable cables will be buried to reduce the impacts of EMF on sensitive receptors and minimise the requirement for additional cable protection.
<b>Decommissioning</b>	
Assessment of impacts and best practice environmental management	Prior to decommissioning a study of the potential environmental impacts to benthic ecology receptors from the proposed decommissioning activities will be undertaken, considering the baseline environment at the pre-decommissioning stage. All mitigation measures to be captured will be captured within the Rehabilitation Schedule and decommissioning strategy within the Offshore EMP. Any licences or authorisations that might be required will be identified and obtained prior to decommissioning, including any validation, updating or new submission of an EIAR, as required.

### 5.3.2 Mitigation and Monitoring Measures

Mitigation measures that were identified and adopted as part of the evolution of the proposed development design (embedded into the proposed development design) and that are relevant to benthic subtidal and intertidal ecology are listed in Table.2. No additional mitigation or monitoring measures are considered necessary for the construction, operation and decommissioning phases specific to the potential impacts on subtidal and intertidal benthic ecology.

## 5.4 Fish and Shellfish Ecology

### 5.4.1 Embedded Mitigation Measures

Table 3: Embedded mitigation measures in relation to fish and shellfish ecology

Measure	Mitigation detail
<b>Construction</b>	
Marine Pollution Contingency Procedure (MPCP)	Marine pollution prevention and contingency measures will be implemented as part of Volume 9, Appendix 6.1: Offshore Environmental Management Plan (EMP; hereafter the Offshore EMP) to manage the risk of accidental pollution from offshore operations relating to the proposed development (Appendix 2A and

Measure	Mitigation detail
	<p>2B in Offshore EMP). The MPCP will include the following control measures and procedures:</p> <ul style="list-style-type: none"> <li>• A chemical risk review with information regarding how and when chemicals (including vessel fuels) are to be used, stored and transported in accordance with recognised best practice guidance and national and international regulations and commitments;</li> <li>• Navigational safety measures (e.g., guard vessels, safety buoys, lighting of active working zones) to reduce the likelihood of collision events; and</li> <li>• Emergency response methods and procedures to deal with any spills and collision incidents.</li> <li>• Implementation of these measures would reduce the likelihood of potentially harmful pollutants to be released into the marine environment, thereby reducing the likelihood of pollution impacts on sensitive fish and shellfish receptors.</li> </ul>
Offshore Waste Management Procedure	<p>An Offshore Waste Management Procedure setting out waste management and disposal procedures will be implemented as part of the Offshore EMP (Appendix 6 in Offshore EMP). The Waste Management Procedure will include the following measures:</p> <ul style="list-style-type: none"> <li>• Application of the waste hierarchy (prevention, re-use, recycle, recovery, and disposal) to minimise the amount of waste produced, and reduce, as far as possible, the amount of waste that is disposed of in landfill;</li> <li>• Waste disposal procedures, ensuring all waste that cannot be reused, recycled or recovered will be kept onboard vessels and safely disposed of onshore in a suitable licensed waste facility; and</li> <li>• Code of conduct for vessel operators with respect to the discharge of wastewater and handling and storing of hazardous materials.</li> </ul> <p>Implementation of these measures will reduce the likelihood of potentially harmful pollutants to be released into the marine environment, thereby reducing the likelihood of pollution impacts on potentially sensitive migratory fish species.</p>
Environmental Vessel Management Plan (EVMP)	<p>An EVMP will be implemented to minimise the risk of collision, injury and disturbance to marine wildlife during construction activities, which will include a code of conduct for vessel operators when encountering marine species (Volume 9, Appendix 14.5). In addition, vessel movements to and from construction sites and ports will, where feasible, follow existing routes. While the measures are targeted towards marine mammals and birds at sea, they would equally reduce the risk of injury and disturbance to marine turtles and larger mobile receptors, such as basking sharks.</p>
Soft-start procedures during pile driving	<p>During the piling of foundations, each piling event will commence with a soft-start at low hammer energy, followed by gradual ramp-up to the maximum hammer energy required (Section 8.3.4.1 in the Offshore Construction Strategy). This would allow sensitive fish and shellfish receptors to vacate the area before sound energy levels reach levels where lethal or sublethal effects may occur.</p>
UXO Management Measures	<p>The clearance of UXO will follow a mitigation hierarchy, with micro-siting of subsea infrastructure around UXO where practicable. Where avoidance is not possible, relocating the UXO to a safe place and leaving in situ will be considered. Where clearance of UXO is required (i.e. avoidance or relocation is not practicable), removal of the UXO from the site or low order clearance at the UXO location will be adopted where feasible. However, removal of the UXO or low order deflagration of the UXO are not always possible and are dependent upon the individual situations surrounding each UXO. Therefore, a high order</p>

Measure	Mitigation detail
	detonation of the UXO may be required. A case-by-case risk assessment will be undertaken following dedicated geophysical and ROV surveys during the construction phase (Volume 9, Appendix 14.4: Marine Mammal Mitigation Protocol (MMMP), and Offshore EMP).
Noise Abatement System (NAS) during high order UXO clearance	Where auditory injury impact ranges for marine mammals from the use of high order detonations are greater than what can be mitigated using Marine Mammal Observers (MMO), Passive Acoustic Monitoring (PAM) and Acoustic Deterrent Devices (ADD) (e.g., > 7.5 km; e.g. 120kg UXO charge weight plus donor weight), noise abatement will be used to reduce the noise propagated through the water column during detonations (MMMP). This would reduce the impact of UXO clearance noise on sensitive fish and shellfish species.
UXO detonation strategy	If UXO detonations are required for clearance, detonations will not occur within the same 24-hour window as piling operations. Where there may be clusters of UXO requiring detonation, these UXO will not be detonated at the same time (Offshore EMP).
Pre-construction profile survey	Where necessary, before works commence and following reinstatement, a topographical survey of the nearshore subtidal area will be carried out to identify and map the contours of the subtidal HDD exit pit to ensure a profile similar in nature to the profile recorded during the pre-construction survey is reinstated, as far as practicable.
<b>Operation</b>	
Cable burial and cable protection measures	Export and inter-array cables will be buried where practicable to ensure they are not exposed by sediment movements (Section 8.3.10 in the Offshore Construction Strategy). Where cables cannot be buried, additional cable protection measures such as rock placement or mattressing will be applied to achieve adequate cable protection. Up to 20% of cable length is expected to need protection either during initial installation, or throughout the operational phase of the proposed development (Volume 3, Chapter 8). Cable burial or cable protection increases the distance between the cables and electro- and magneto-sensitive receptors, thereby reducing the received EMF (from attenuation of the EMF).
MPCP, Offshore Waste Management Procedure, EVMP	Marine pollution and waste management control measures and vessel operating procedures will be implemented throughout the operational phase of the proposed development, following the same measures and procedures that were implemented during the construction phase.
<b>Decommissioning</b>	
Assessment of impacts and best practice environmental management	Prior to decommissioning a study of the potential environmental impacts to fish and shellfish receptors from the proposed decommissioning activities will be undertaken, considering the baseline environment at the pre-decommissioning stage. All mitigation measures to be captured will be identified within the Rehabilitation Schedule and decommissioning strategy within the Offshore EMP. Any licences or authorisations that might be required will be identified and obtained prior to decommissioning, including any validation, updating or new submission of an EIAR, as required.

#### 5.4.2 Mitigation and Monitoring Measures

Mitigation measures that were identified and adopted as part of the evolution of the proposed development design (embedded into the project design) and that are relevant for fish and shellfish



receptors are listed in Table 3. No additional mitigation or monitoring measures are considered necessary for the construction, operation and decommissioning phases specific to the potential impacts on fish and shellfish ecology.

## 5.5 Marine Mammal Ecology

### 5.5.1 Embedded Mitigation Measures

Table 4 Embedded mitigation measures in relation to marine mammal ecology

Measure	Mitigation detail
<b>Construction</b>	
Marine Pollution Contingency Procedure (MPCP)	<p>An offshore Environment Management Plan (EMP) is provided in Appendix 6.1 and will be implemented to cover the construction, operational and decommissioning phase of the proposed development. The Offshore EMP includes a MPCP to cover accidental spills, potential contaminant release and include key emergency contact details. Key measures in the MPCP include:</p> <ul style="list-style-type: none"> <li>• Compliance with MARPOL;</li> <li>• Spill kits on board all vessels;</li> <li>• Fuel and chemical storage according to relevant storage regulations;</li> <li>• Handling of waste in accordance with relevant waste regulations; and</li> <li>• Vessel refuelling to take place in port.</li> </ul> <p>The measures included in the MPCP would reduce the likelihood of potentially harmful pollutants to be released into the marine environment which may then impact on marine mammal receptors. Further information is provided in Appendix 6.1.</p>
Collision avoidance	<p>The Department of Communications, Marine and Natural Resources released a Marine Notice (No 15 of 2005) for the correct procedures when encountering whales and dolphins in Irish coastal waters (DCMNR 2005). Alongside this Marine Notice, the Irish Whale and Dolphin Group provided a Code of Conduct for all watercraft encountering whales and dolphins (IWDG 2005). These guidelines were drafted specifically for the interactions between small vessels and marine mammals (e.g. whale watching passenger vessels), however the key principals will be followed by all project vessels where practicable to minimise the risk of vessel collisions with marine mammals and disturbance to marine mammals from vessels. These measures are captured within Appendix 14.5 Environmental Vessel Management Plan (EVMP). Other key measures to mitigate collision risk, as described in the EVMP include:</p> <ul style="list-style-type: none"> <li>• When an animal(s) is first sighted, vessels should maintain a steady course (speed and direction) to allow marine mammals to predict the vessel's path;</li> <li>• Where practicable, when an animal(s) is in close proximity (for example 100 – 200 m), vessel speed should be gradually reduced and maintained below 7 knots (in accordance with DCMNR, 2005). The exception to this is when behaviour such as bow riding is</li> </ul>

Measure	Mitigation detail
	<p>experienced, where speed should be maintained on a steady course;</p> <ul style="list-style-type: none"> <li>• If animals are moving in a consistent direction, maintain a parallel course;</li> <li>• Do not cut off individuals by moving across their path;</li> <li>• Avoid deliberately approaching marine mammals when sighted;</li> <li>• Avoid abrupt changes to course or speed should marine mammals approach the vessel, be on course to cross the path of a vessel or bow-ride; and</li> <li>• Transit vessels should maintain a minimum distance of 150 m or more from the coast, particularly when near to known seal haul-out sites during sensitive periods (i.e. moulting and breeding seasons). Vessels should remain in the vicinity of seals for no more than 15 minutes.</li> </ul> <p>Further information is provided in Appendix 6.1.</p>
Pile driving parameters and soft start procedures	<p>In order to reduce the risk of PTS and disturbance to marine mammals during piling activities the maximum hammer energy to be used during pile driving (5,500kJ for monopile, 3,000kJ for multi leg pin-piles). Inclusion of soft-start and ramp up procedures for pile driving have also been incorporated into the design and no simultaneous piling events will occur. This requirement is captured within the MMMP.</p>
<b>Operation</b>	
Marine Pollution Contingency Procedure (MPCP)	<p>The Offshore EMP includes a MPCP to cover accidental spills, potential contaminant release and include key emergency contact details.</p> <ul style="list-style-type: none"> <li>• Key measures in the MPCP include:</li> <li>• Compliance with MARPOL;</li> <li>• Spill kits on board all vessels;</li> <li>• Fuel and chemical storage according to relevant storage regulations;</li> <li>• Handling of waste in accordance with relevant waste regulations; and</li> <li>• Vessel refuelling to take place in port.</li> </ul> <p>The MPCP would reduce the likelihood of potentially harmful pollutants to be released into the marine environment which may then impact on marine mammal receptors.</p>
Collision avoidance	<p>The Department of Communications, Marine and Natural Resources released a Marine Notice (No 15 of 2005) for the correct procedures when encountering whales and dolphins in Irish coastal waters (DCMNR 2005). Alongside this Marine Notice, the Irish Whale and Dolphin Group provided a Code of Conduct for all watercraft encountering whales and dolphins (IWDG 2005). These guidelines were drafted specifically for the interactions between small vessels and marine mammals (e.g. whale watching passenger vessels), however the key principals will be followed by all proposed development vessels where practicable to minimise the risk of vessel collisions with marine mammals and disturbance to marine mammals from vessels. These measures are captured within Appendix 14.5 EVMP. Other key measures from the EVMP are the same as those listed in the construction collision avoidance mitigations section of this table.</p>



Measure	Mitigation detail
<b>Decommissioning</b>	
Collision avoidance	The Department of Communications, Marine and Natural Resources released a Marine Notice (No 15 of 2005) for the correct procedures when encountering whales and dolphins in Irish coastal waters (DCMNR 2005). Alongside this Marine Notice, the Irish Whale and Dolphin Group provided a Code of Conduct for all watercraft encountering whales and dolphins (IWDG 2005). These guidelines were drafted specifically for the interactions between small vessels and marine mammals (e.g. whale watching passenger vessels), however the key principals will be followed by all Project vessels where practicable to minimise the risk of vessel collisions with marine mammals and disturbance to marine mammals from vessels. These measures are captured within the EVMP. Other key measures from the EVMP are the same as those listed in the construction collision avoidance mitigations section of this table.
Assessment of impacts and best practice environmental management	Prior to decommissioning a study of the potential environmental impacts to marine mammal receptors from the proposed decommissioning activities would be undertaken, considering the baseline environment at the pre-decommissioning stage. All mitigation measures to be delivered would be captured within the Rehabilitation Schedule and Offshore EMP. Any licences or authorisations that might be required would be identified and obtained prior to decommissioning, including any validation, updating or new submission of an EIAR, as required.

## 5.5.2 Mitigation and Monitoring Measures

Table 5: Mitigation related to marine mammal ecology

Measure	Mitigation detail
<b>Construction</b>	
Geophysical survey monitoring	<ul style="list-style-type: none"> <li>• Geophysical survey equipment sources with a greater than negligible magnitude of impact will be covered by 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (DAHG 2014), which outlines measures to reduce the potential impacts (PTS and disturbance) to negligible levels. Only the SBP is predicted to overlap with the estimated hearing range of relevant marine mammal species. Measures proposed are: <ul style="list-style-type: none"> <li>- A mitigation zone (an area within which mitigation must be applied to prevent instantaneous injury) of 500m radial distance from the SBP source; and</li> <li>- A qualified and experienced marine mammal observer (MMO) will be appointed to monitor for marine mammals and to log all relevant events using standardised data forms in accordance with licensing and regulatory requirements; and</li> <li>- Survey equipment with a source SPL above 170 dB re 1µPa shall commence from a lower energy start-up and increase gradually over a period of 40 minutes.</li> <li>- The start of the acoustic equipment will be delayed if marine mammals are detected within the mitigation zone during the pre-watch, allowing the animals time to move away from the acoustic</li> </ul> </li> </ul>

Measure	Mitigation detail
	<p>source. The start of the source will be delayed for at least 30 minutes following the last sighting within the mitigation zone; and</p> <ul style="list-style-type: none"> <li>- For any breaks in operation of the equipment of 10 minutes the MMO/PAM operator will undertake dedicated monitoring to check no marine mammals are present within the mitigation zone prior to the source restarting; and</li> <li>- For line changes taking longer than 40 minutes, the source will be stopped, then a pre-watch of 30 minutes followed by a soft-start will be required to resume operations.</li> </ul> <p>These measures and further detail on these measures are included in the MMMP (Appendix 14.4).</p>
Pre-construction further noise modelling	Post consent during the pre-construction phase, there will be further noise modelling undertaken with finalised piling and design parameters to confirm impacts on marine mammals, this will be documented within the MMMP (Appendix 14.4).
<p>Piling mitigation, including:</p> <ul style="list-style-type: none"> <li>• Marine Mammal Observers (MMO)</li> <li>• Passive Acoustic Monitoring (PAM) (if required)</li> <li>• Acoustic Deterrent Devices (ADD) (if required)</li> <li>• At-source noise reduction (if required)</li> </ul>	<p>The implementation of a MMMP (see Appendix 14.4) includes measures to ensure the risk of PTS to marine mammals is imperceptible and will be in line with the latest relevant available guidance such as the guidance to manage the risk to marine mammals from man-made sound sources in Irish waters (NPWS 2014). Mitigation measures outlined in the MMMP include those that are considered to be 'industry standard' and are supported by the NPWS (2014) guidance including:</p> <ul style="list-style-type: none"> <li>• A mitigation zone. The mitigation zone will be defined as the maximum potential PTS onset impact range. Noise modelling will be updated, if required, prior to construction once the final design details are known. The DAHG (2014) guidance recommends a mitigation zone of 1,000 m for piling which is greater than the current largest impact range for instantaneous PTS onset modelled for the proposed development (i.e. 810 m). Whilst the SELcum PTS onset ranges are currently larger than this, ADDs are effective at displacing marine mammals at larger ranges and as such can provide cover for impact ranges greater than the advised 1,000m mitigation zone. Additionally, were noise abatement systems to be implemented for the proposed development, the impact ranges would be expected to be reduced compared to those considered in this version of the MMMP.</li> <li>• A qualified and experienced marine mammal observer (MMO) will be appointed to monitor for marine mammals and to log all relevant events using standardised data form.</li> <li>• PAM (if required to supplement to visual observations). PAM will be used as a form of mitigation under hours of darkness and/or low visibility when an MMO cannot visually observe.</li> <li>• In addition, additional mitigation measures that will be implemented to reduce the risk of PTS to negligible levels include the use of ADDs to deter marine mammals from the immediate vicinity of the pile.</li> <li>• Pre-piling deployment of ADDs (if required) Use of ADDs within this protocol follows the JNCC (2010) guidance in the absence of</li> </ul>

Measure	Mitigation detail
	<p>information within DAHG (2014) guidance, as well as best practice followed on recent OWFs in Scottish and English waters.</p> <ul style="list-style-type: none"> <li>In the event that impact ranges predicted by the underwater noise modelling to be undertaken based on the final design for the proposed development post-consent are larger than distances capable of passive mitigation (MMOs and PAM) and ADDs, Noise Abatement Systems (NAS) may be used to minimise the risk of injury. NAS will be used if required to reduce the effect to negligible levels. The MMMP with selected mitigation measures will be updated post consent once a piling contractor is in place and final detailed installation methods are known.</li> </ul>
<p>UXO clearance mitigation measures, including:</p> <ul style="list-style-type: none"> <li>MMO</li> <li>ADD (if required)</li> <li>At-source noise reduction (if required)</li> </ul>	<p>The implementation of a MMMP (Appendix 14.4) with specific measures should UXO clearance be required, to ensure the risk of PTS to marine mammals is imperceptible (not significant levels). The list of measures and procedures, can be modified in accordance with advice received from the regulator and their specialist UXO advisors as appropriate prior to UXO clearance activities commencing. Measures will include:</p> <ul style="list-style-type: none"> <li>If detonation is deemed necessary, a mitigation zone of 1,000 m from the detonation location will be established, within which it will be ensured, through visual observations (trained and experienced MMOs).</li> <li>Where a UXO disposal method has a risk of PTS impact range that may exceed the 1,000m mitigation zone there is a residual risk of auditory injury to marine mammals at a greater range than can be mitigated by monitoring of the 1,000 m mitigation zone alone. Therefore, an ADD will be operated for a pre-determined length of time, concurrent to the pre-detonation search, to deter marine mammals to a greater distance prior to any detonation.</li> <li>Where auditory injury impact ranges from the use of high order detonations are greater than what can be mitigated using MMO/PAM watch and ADD (e.g. &gt; 7.5 km; e.g. 120kg + donor impact ranges shown in Table 7 1), noise abatement will be used. MMO/PAM pre-watch and ADD use will still be required if noise abatement is used.</li> <li>It is recommended for the MMO to continue monitoring the mitigation zone during the detonation procedure and undertake a post-detonation search for at least 15 minutes after the final detonation.</li> </ul>
<b>Operation</b>	
Nil	No mitigation measures are anticipated to be required specifically during the operational phase.

Measure	Mitigation detail
<b>Decommissioning</b>	
Nil	No additional mitigation measures are anticipated to be required specifically during the decommissioning phase. All relevant embedded mitigation measures will still apply.

## 5.6 Offshore and Intertidal Ornithology

### 5.6.1 Embedded Mitigation Measures

Table 6: Embedded mitigation measures in relation to offshore and intertidal ornithology

Measure	Mitigation detail
Refinement and reduction in the offshore development area	<p>Refinements in the offshore development area (as outlined in the Alternatives Chapter) were undertaken to avoid key areas for birds (e.g., avoidance of density hotspots that may indicate key foraging areas where possible, alongside avoidance of breeding colonies and migration corridors where possible). Reducing the extend of the offshore development area also increases distance from Rockabill Island and Lambay Island which leads to a considerable reduction in interaction with bird species that inhabit these SPA colonies.</p> <p>There has been a considerable reduction in the size of the array area from the original MAC boundary. This process considered hotspots of auks, the most abundant species within the survey area, using species heatmaps from raw observations and a modelled approach using MRSea (MRSea Modelling Report). The results of this modelling clearly show high densities of guillemots and razorbills in proximity to Lambay Island during the breeding season. During this time the densities of birds within the array area are comparatively low. Outside of the breeding season there are no clear hotspots throughout the survey area (MAC boundary plus 4km buffer). This process was undertaken for the proposed development, with the array area of the proposed development being reduced by more than 60% from the MAC boundary of 195.9km<sup>2</sup> to the refined array area of 88.5km<sup>2</sup>.</p>
Increase in air draft	<p>The design has increased the WTG air draft, which reduces the collision risk to key vulnerable ornithological receptors by reducing the rotor swept area that is at collision risk height.</p> <p>All turbines in Project Option 1 will have minimum air draft of 40m LAT. Turbines in Project Option 2 will have a minimum air draft of 40m LAT except where they are in the aviation restriction zone where the air draft will be 35m LAT.</p> <p>The number of birds at collision risk height at 40m is considerably reduced compared to 22m. For example, the number of common tern flying at collision risk height is reduced by 90.6% between 22m and 40m. Likewise, kittiwake have a reduction of birds at collision risk height of 82.2% between 22m and 40m, and gulls show a reduction of roughly 65%.</p>
Lighting design	<p>Lighting design will avoid lighting levels that exceed those required to comply with navigational safety, aviation, emergency procedures and general activity to reduce the risk of WTG and OSP lighting attracting birds during periods of bad weather or at night. This measure will be provided as part of the Lighting Management Plan (LMP).</p>
Standard pollution and	<p>Each WTG will be equipped with sensors to enable early detection of fluids and leaks. Spill kits will also be located on each WTG to contain any fluids in the unlikely event of pollutant release. Pollution and waste management is considered within Volume 9,</p>

Measure	Mitigation detail
waste management	Appendix 6.1: Offshore Environmental Management Plan (EMP; hereafter the Offshore EMP).
Assessment of impacts and best practice environmental management	Prior to decommissioning a study of the potential environmental impacts to fish and shellfish receptors from the proposed decommissioning activities would be undertaken, considering the baseline environment at the pre-decommissioning stage. All mitigation measures to be captured would be captured within the Rehabilitation Schedule. Any licences or authorisations that might be required would be identified and obtained prior to decommissioning, including any validation, updating or new submission of an EIAR, as required.

## 5.6.2 Mitigation and Monitoring Measures

### Mitigation

Table 7: Mitigation measures in relation to offshore and intertidal ornithology

Mitigation measure	Description
<b>Construction</b>	
Vessels to avoid birds	Where practicable vessels accessing the offshore development area during construction are to seek to avoid 'rafts' of birds and feeding aggregates to minimise disturbance and displacement. This measure is provided as part of the EVMP.
Use of established navigation routes	Vessel movements will follow, where practicable, existing navigation routes enroute to the array area and offshore export cable, where the densities of divers and seabirds are typically relatively low due to regular vessel presence compared to the wider inshore area. This measure is provided as part of the EVMP.
Avoidance of rafting birds during vessel transit	Avoidance of rafting birds during transiting and within the offshore development area, with particular consideration within the North-west Irish Sea candidate Special Protection Area (cSPA). Vessels will seek to avoid rafting birds and where practicable avoid disturbance to areas with consistently high diver density. This measure is provided as part of the EVMP.
Avoidance of over-revving of engines	Vessels will seek to avoid unnecessary running of engines and idling engines while anchored, in order to minimise noise disturbance. Vessels will shut down engines or maintain low engine power as soon as possible. This measure is provided as part of the EVMP.
Briefing of vessel crew	Vessel crew will be briefed on the purpose and implications of the vessel management practices outlined in the EVMP.
<b>Operation</b>	
Vessels to avoid birds	Where practicable vessels accessing the offshore development area during operation are to seek to avoid 'rafts' of birds and feeding aggregates to minimise disturbance and displacement. This measure is provided as part of the EVMP.

Mitigation measure	Description
Use of existing navigation routes	Vessel movements will follow, where practicable, existing navigation routes enroute to the array area and offshore export cable, where the densities of divers and seaducks are typically relatively low due to regular vessel presence compared to the wider inshore area. This measure is provided as part of the EVMP.
Avoidance of rafting birds during vessel transit	Avoidance of rafting birds during transiting and within the offshore development area, with particular consideration within the North-west Irish Sea cSPA. Vessels will seek to avoid rafting birds and where practicable seek to avoid disturbance to areas with consistently high diver density. This measure is provided as part of the EVMP.
Avoidance of over-revving of engines	Vessels will seek to avoid unnecessary running of engines and idling engines while anchored, in order to minimise noise disturbance. Vessels will shut down engines or maintain low engine power as soon as possible. This measure is provided as part of the EVMP.
Briefing of vessel crew	Vessel crew will be briefed on the purpose and implications of the vessel management practices outlined in the EVMP.
Reduction of vessel activity in sensitive months	During the operational phase the proposed development will reduce vessel activity in the ECC during the most sensitive months for coastal divers (November to March 1st inclusive), where practicable. This measure is provided as part of the EVMP.
<b>Decommissioning</b>	
Vessels to seek to avoid birds	Where practicable vessels accessing the offshore development area during decommissioning are to seek to avoid 'rafts' of birds and feeding aggregates to minimise disturbance and displacement. This measure is provided as part of the EVMP.
Use of existing navigation routes	Vessel movements will follow, where practicable, existing navigation routes enroute to the array area and offshore export cable, where the densities of divers and seaducks are typically relatively low due to regular vessel presence compared to the wider inshore area. This measure is provided as part of the EVMP.
Avoidance of rafting birds during vessel transit	Avoidance of rafting birds during transiting and within the offshore development area, with particular consideration within the North-west Irish Sea cSPA. Vessels will seek to avoid rafting birds and where practicable seek to avoid disturbance to areas with consistently high diver density. This measure is provided as part of the EVMP.
Avoidance of over-revving of engines	Vessels will seek to avoid unnecessary running of engines and idling engines while anchored, in order to minimise noise disturbance. Vessels will shut down engines or maintain low engine power as soon as possible. This measure is provided as part of the VMP.



Mitigation measure	Description
Briefing of vessel crew	Vessel crew will be briefed on the purpose and implications of the vessel management practices outlined in the EVMP.

## Monitoring

The proposed development is committed to participating in the 'East Coast Monitoring Group' (ECMG), to discuss and agree potential strategic monitoring initiatives in relation to offshore ornithology. The need for strategic monitoring, and the level of participation by individual projects, will be determined by the conclusions of the EIAR and NIS process, in consultation with statutory and technical stakeholders, and with a focus on validation and evidence gathering.

If further monitoring is required for the proposed development on a project alone basis, then this will be determined through consultation with relevant stakeholders.

## 5.7 Commercial Fisheries

### 5.7.1 Embedded Mitigation Measures

Table 8: Embedded mitigation measures in relation to commercial fisheries

Embedded mitigation	Justification
<b>Construction</b>	
Fisheries liaison	<p>The Developer is committed to ongoing liaison with fishers throughout all stages of the project, including:</p> <ul style="list-style-type: none"> <li>Continuation of the appointment of a company FLO to continue to maintain effective communications between the project and fishers, in compliance with the Seafood/ORE Engagement in Ireland guidance (Seafood/ORE Working Group, 2023);</li> <li>Appropriate liaison with relevant fishing interests to ensure that they are fully informed of development planning and any offshore activities and works;</li> <li>Timely issue of notifications including Notice to Mariners (NtMs), Kingfisher Bulletin notifications and other navigational warnings to the fishing community to provide advance warning of project activities and associated advisory safe passing distances; and</li> <li>Development of an FMMS (Appendix 16.2) setting out in detail the approach to fisheries liaison and means of delivering co-existence and disruption payments.</li> </ul>
Agreement of lighting and marking with Commissioners of Irish Lights during construction.	Implementation of a buoyed construction area around the site (assumed to be 12 construction buoys during the appropriate phases, in consultation with Commissioners of Irish Lights.
Dropped objects	The approach for dealing with dropped objects, including reporting and recovery of dropped objects where they pose a potential hazard to other marine users, is included in the offshore environmental management plan (EMP).

Embedded mitigation	Justification
	<p>Measures to prevent dropped objects include:</p> <p>Good housekeeping practices, with all wastes correctly stored;</p> <p>Storage of hazardous chemicals as per material safety data sheet (MSDS);</p> <p>Lift planning for over-the-side lifting (including appropriate crane rigging and load ratings, crane operator and rigger training and competency requirements) all lifting equipment will be tested and certified;</p> <p>A ship-to-ship transfer permit will be in place;</p> <p>All deck items will be securely stowed;</p> <p>Transfers of objects will use specialist equipment and consider environmental conditions;</p> <p>Ongoing personnel awareness and training, and dropped object prevention programs (e.g., lanyards on hardhats, hand tools);</p> <p>Safe working procedures to prevent dropped objects;</p> <p>Procedures will be put in place to ensure that the location of any lost material is recorded and that significant objects are recovered - including ROV and boat recovery where practicable;</p> <p>Ongoing personnel awareness and training, and dropped object prevention programs; and</p> <p>Waste Management Plan.</p>
Cable Burial Risk Assessment (CBRA)	<p>CBRA undertaken pre-construction following detailed site investigation surveys including consideration of under keel clearance and appropriate cable protection applied based upon the outcomes. To include consideration of requirements for monitoring of the protection.</p>
Guard vessels	<p>Use of temporary guard vessel during construction phase will be employed if deemed necessary during detailed design stage and following consultation with the relevant statutory authorities, e.g. to protect unlit structures and/or unprotected cable prior to burial.</p>
Advisory safety zones	<p>During construction the proposed development will deploy advisory safety zones around individual structures undergoing installation. Due to a lack of Irish guidance, it is proposed to establish zones based on the relevant UK guidance, UK guidance MGN 654 (Maritime and Coastguard Agency, 2021).</p> <p>Advisory safety zones of up to 500m in radius around individual structures undergoing installation will be established. Advisory safety zones of 50m will be sought for incomplete structures where construction activity may be temporarily paused (and therefore the 500m safety zone has lapsed) such as installed foundations or where construction works are completed but the WTGs have not yet been commissioned.</p>
Advisory safe passing distances	<p>Use of advisory safe passing distances including surrounding vessels that are undertaking sensitive construction, installation, or maintenance works.</p>



Embedded mitigation	Justification
	These vessels are likely to display Restricted in Ability to Manoeuvre (RAM) status.
<b>Operation</b>	
Fisheries liaison	<p>The Developer is committed to ongoing liaison with fishers throughout all stages of the project, including:</p> <ul style="list-style-type: none"> <li>• Continuation of the appointment of a company FLO to continue to maintain effective communications between the project and fishers, in compliance with the Seafood/ORE Engagement in Ireland guidance (Seafood/ORE Working Group, 2023);</li> <li>• Appropriate liaison with relevant fishing interests to ensure that they are fully informed of development planning and any offshore activities and works;</li> <li>• Timely issue of notifications including Notice to Mariners (NtMs), Kingfisher Bulletin notifications and other navigational warnings to the fishing community to provide advance warning of project activities and associated advisory safe passing distances; and</li> <li>• Development of a FMMS (Appendix 16.2) setting out in detail the approach to fisheries liaison and means of delivering co-existence and disruption payments.</li> </ul>
Snagging	In the instance that snagging does occur, the Developer will work to the protocols laid out within the guidance produced by the UK FLOWW group and 'Recommendations for Fisheries Liaison: Best Practice' guidance for offshore renewable developers, in particular Section 11: Dealing with claims for loss or damage of gear as confirmed in the FMMS (Appendix 16.2).
Agreement of lighting and marking with Commissioners of Irish Lights during the operation and maintenance phase.	<p>The Developer is committed to marking and lighting the project in accordance with relevant industry guidance and as advised by relevant stakeholders including in accordance with IALA Recommendation O-139 (IALA, 2013) and Irish Lights requirements. In particular, the use of marine lighting to mark selected peripheral structures.</p> <p>The Developer will also ensure all structures associated with the proposed development are adequately marked on nautical and electronic charts.</p>
Advisory safety zones	During the operational phase, the proposed development will deploy advisory safety zones around any WTG or OSP to protect technicians, crew and vessels on-site during any maintenance works. Safety zones are not a statutory requirement in Ireland meaning they are advisory only, however following UK guidance MGN 654 (Maritime and Coastguard Agency, 2021) the safety zones will be 50m during the operational phase.
Advisory safe passing distances	The proposed development will recommend that advisory clearance distances of up to 500m in radius are observed around cable installation vessels and cable repair vessels during the operational phase.

Embedded mitigation	Justification
<b>Decommissioning</b>	
Fisheries liaison	<p>The Developer is committed to ongoing liaison with fishers throughout all stages of the project, including:</p> <ul style="list-style-type: none"> <li>▪ Continuation of the appointment of a company FLO to continue to maintain effective communications between the project and fishers, in compliance with the Seafood/ORE Engagement in Ireland guidance (Seafood/ORE Working Group, 2023);</li> <li>▪ Appropriate liaison with relevant fishing interests to ensure that they are fully informed of development planning and any offshore activities and works;</li> <li>▪ Timely issue of notifications including Notice to Mariners (NtMs), Kingfisher Bulletin notifications and other navigational warnings to the fishing community to provide advance warning of project activities and associated advisory safe passing distances; and</li> <li>▪ Development of a FMMS (Appendix 16.2) setting out in detail the approach to fisheries liaison and means of delivering co-existence and disruption payments.</li> </ul>
Agreement of lighting and marking with Commissioners of Irish Lights during decommissioning.	Implementation of a buoyed decommissioning area around the site (assumed to be 12 decommissioning buoys during the appropriate phases, in consultation with Commissioners of Irish Lights.
Advisory safety zones	<p>During decommissioning the proposed development will deploy advisory safety zones around individual structures undergoing installation. Due to a lack of Irish guidance, it is proposed to establish zones based on the relevant UK guidance, UK guidance MGN 654 (Maritime and Coastguard Agency, 2021).</p> <p>Advisory safety zones of up to 500m in radius around individual structures undergoing installation will be established.</p>
Advisory safe passing distances	<p>Use of advisory safe passing distances including surrounding vessels that are undertaking sensitive decommissioning works. These vessels are likely to display Restricted in Ability to Manoeuvre (RAM) status.</p>
Decommissioning strategy	<p>A decommissioning strategy will be developed to cover the decommissioning phase and included as part of the Offshore EMP and Rehabilitation Schedule. The decommissioning strategy is anticipated to cover the removal of all structures above the seabed; cutting of piled foundations at approximately 1m to 2m below the seabed, with remaining sections fully buried; decision to leave or remove scour protection and buried assets; and secure burial of export cables in the intertidal area.</p>

## 5.7.2 Mitigation and Monitoring Measures

Table 9 Mitigation measures relating to commercial fisheries

Measure	Mitigation description
<b>Construction</b>	
<p>Volume 9, Appendix 16.2: Fisheries Management and Mitigation Strategy (FMMS)</p>	<p>This chapter has concluded significant impacts requiring additional mitigation for Irish demersal otter trawlers targeting Nephrops (<i>Nephrops norvegicus</i>) within the array area during the construction phase of the proposed development. Under the NMPF, where significant impacts are identified, a FMMS should be prepared (Fisheries Policy 2). This is provided as Volume 9 Appendix 16.2.</p> <p>The mitigation measures provided within the FMMS have been developed in consultation with the industry and will continue to be delivered through the FMMS as it remains a live document. The FMMS includes the following key principles and measures relevant to construction:</p> <ul style="list-style-type: none"> <li>• <b>The proposed development will provide a Fisheries Liaison Strategy</b></li> </ul> <p>The implementation of appropriate communication and information transfer strategies is of key importance to assist in minimising interference and facilitating effective co-existence with the fishing industry.</p> <p>The principles of liaison are that:</p> <ul style="list-style-type: none"> <li>• The Developer will undertake regular and routine communications via NtM to provide reasonable time (accounting for adverse weather etc.) to enable operational fishing business decisions to be made;</li> <li>• Continued engagement, constructive two-way communication and proactive dialogue between the fishers, their representatives and other fisheries stakeholders and the Developer is desired and is advantageous to all parties; and</li> <li>• All maritime operations that may have an effect on the commercial fishing sector will be made on a factual and accurate basis, in order to prevent unnecessary escalation of issues.</li> <li>• <b>The proposed development will follow the Seafood / Offshore Renewable Energy (ORE) Working Group Summary guidance (Seafood/ORE Working Group, 2023)</b></li> </ul> <p>The FMMS provides a schedule for liaison and information dissemination. Notice and information will aim to be provided not less than 14 days prior for individual construction vessels mobilisations (where feasible) and weekly construction status updates will be provided.</p> <ul style="list-style-type: none"> <li>• <b>The Developer will minimise the size and duration of advisory safety zones during surveys and other works where safe and practicable to do so.</b></li> <li>• <b>The Developer will provide local fisheries stakeholders with procedures for registering disruption payment claims for loss of/damage to fishing gear in association with surveys and construction activities of the proposed development.</b></li> <li>• <b>Vessels undertaking operations in relation to the proposed development will be working to appropriate safety management systems to ensure safe work practices.</b></li> </ul>

Measure	Mitigation description
	<ul style="list-style-type: none"> <li>• <b>Vessels undertaking operations in relation to the proposed development will only undertake activities prescribed in their line of work.</b></li> <li>• <b>Vessels involved in the construction, operation and maintenance and decommissioning of the proposed development, including guard vessels and survey vessels, will be provided with the relevant lines of communication (as outlined within the FMMS) to minimise interaction with fishing vessels undertaking their normal activities.</b></li> <li>• The proposed development will provide a Co-existence Strategy The Developer regards coexistence as the continuation of both the proposed development and fishing industry activities at the same time within and around the array area and along the ECC. Specifically, these commitments relate to: <ul style="list-style-type: none"> <li>• Proposed development design, i.e. the location and coordination of all wind farm layout infrastructure and cable burial and protection;</li> <li>• The offshore development area represents only 36% of the full MAC boundary area and was reduced as a commitment by the Developer to ensure optimal seabed usage where possible, whilst ensuring the key other marine users are impacted as minimally as possible;</li> <li>• Design of the array area that maximised corridors between turbines for navigation and orientated the turbines in a NNW - SSE direction to facilitate the direction of trawling in this area;</li> <li>• Appropriate notification of survey and construction activities to other marine users and the retention of a FLO and OFLO;</li> <li>• Appropriate lighting and marking of the proposed development and construction vessels;</li> <li>• Appropriate charting of the proposed development and notification of any hazards; and</li> <li>• The adoption of advisory safety zones and a process for marine coordination of all vessel activity.</li> <li>• Code of good practice for all vessels sets out measures for safe navigation, communication, vessel scheduling and reporting of any disruption.</li> <li>• Procedures in relation to gear fastening or loss; set out protocols for securing gear, reporting losses, retrieving lost gear and communicating any entanglement hazards.</li> </ul> </li> <li>• <b>In addition to the commitments above, vessels undertaking operations in relation to the proposed development will be required to follow the mitigation and management measures provided in other documents and management plans committed to by the proposed development. These are referenced within the FMMS and include:</b> <ul style="list-style-type: none"> <li>- The Lighting and Marking Plan (Volume 9, Appendix 17.3); sets out the types, placement and intensity of lights, identification systems and protocols to ensure visibility and safety.</li> </ul> </li> </ul>

Measure	Mitigation description
	<ul style="list-style-type: none"> <li>- The Vessel Management Plan (VMP) (Volume 9, Appendix 17.2); sets out navigational safety measures for the proposed development, including use of advisory safety zones and guard vessels (as appropriate)</li> <li>- The Offshore Environmental Management Plan (EMP) (Volume 8, Appendix 6.1); includes a Dropped object procedure which sets out measures for risk assessment, reporting and retrieval protocols for dropped objects.</li> </ul>
<p>Sustainable Fisheries Community (SFC) (Appendix B within the FMMS Appendix 16.2)</p>	<ul style="list-style-type: none"> <li>• <b>The proposed development will develop and deliver a Sustainable Fisheries Community (SFC)</b></li> </ul> <p>The SFC is a mechanism to deliver long-term proactive fisheries impact mitigation through collaboration and mutual cooperation between the local fishing community and the Developer. It is a live document and will be updated to reflect the current fishing and construction schedule ahead of the construction commencing.</p> <p>The key aim is to establish a SFC focused on the protection and enhancement of a locally sustainable fisheries and marine environment in the waters around the proposed development. This ambition includes the following delivered throughout the lifetime of the proposed development:</p> <ul style="list-style-type: none"> <li>• Collaboration between the Developer and local fishing community.</li> <li>• Provide a definition of what is considered the local fishing community.</li> <li>• Deliver a proactive fisheries impact mitigation process.</li> <li>• Create a mechanism to deliver benefits, both to and from, the local fishing ports.</li> <li>• Work collaboratively to deliver enhancements to the local marine environment.</li> <li>• To, in a broad context, enhance the sustainability of the local fishing community.</li> <li>• Establish ways of collaboratively adding value to local seafood produce.</li> </ul> <p>The SFC will focus on the commercial fishing industry in the long term through such measures such as enhancing stocks, improvements to fishing vessels, improvements that enhance the profit margins of sustainable fishing activities, and the development of new fisheries or other activities. Where construction related impacts occur, and where there are claims to be considered, the developer will require a significant level of supporting evidence for any such claims. It is for this reason that the Developer has gathered extensive fishing activity information, so as to ensure that this lengthy process can be expedited, for known fishers in the area. The Developer will develop a fair, transparent and evidence based disturbance payment scheme for those fishers that can evidence disruption.</p> <p>Further information of the SFC is provided in the FMMS Volume 9 (Appendix 16.2).</p>

Measure	Mitigation description
<b>Operation</b>	
FMMS	<p>This chapter has concluded significant impacts requiring additional mitigation for Irish demersal otter trawlers targeting Nephrops (<i>Nephrops norvegicus</i>) within the array area during operation. Under the NMPF, where significant impacts are identified, a FMMS should be prepared (Fisheries Policy 2). This is provided as Volume 9 Appendix 16.2.</p> <p>The mitigation measures provided within the FMMS have been developed in consultation with the industry and will continue to be delivered through the FMMS as it remains a live document. The key principles and mitigation details are presented earlier in this table and the measures that are relevant to operation are:</p> <ul style="list-style-type: none"> <li>• <b>The Developer will provide a Fisheries Liaison Strategy</b></li> <li>• <b>The Developer will follow the Seafood / Offshore Renewable Energy (ORE) Working Group Summary guidance (Seafood/ORE Working Group, 2023)</b></li> <li>• <b>The proposed development will minimise the size and duration of advisory safety zones during operation and maintenance and other activities where safe and practicable to do so.</b></li> <li>• <b>Vessels undertaking operations in relation to the proposed development will be working to appropriate safety management systems to ensure safe work practices.</b></li> <li>• <b>Vessels undertaking operations in relation to the proposed development will only undertake activities prescribed in their line of work.</b></li> <li>• <b>Vessels involved in the operation and maintenance of the proposed development, including guard vessels and survey vessels, will be provided with the relevant lines of communication (as outlined within the FMMS) to minimise interaction with fishing vessels undertaking their normal activities.</b></li> <li>• <b>The proposed development will provide a Co-existence Strategy</b></li> </ul> <p>In addition to the commitments above, vessels undertaking operations in relation to the proposed development will be required to follow the mitigation and management measures provided in other documents and management plans committed to by the proposed development. These are referenced within the FMMS and include the VMP, LMP and Offshore EMP.</p>
SFC	<ul style="list-style-type: none"> <li>• <b>The proposed development will develop and deliver a Sustainable Fisheries Community (SFC)</b></li> <li>• The SFC is a mechanism to deliver long-term proactive fisheries impact mitigation through collaboration and mutual cooperation between the local fishing community and the Developer. It is a live document and will be updated to reflect the current fishing ahead of the operation commencing.</li> <li>• The key aim is to establish a SFC focused on the protection and enhancement of a locally sustainable fisheries and marine</li> </ul>

Measure	Mitigation description
	<p>environment in the waters around the proposed development. This ambition includes the following delivered throughout the lifetime of the proposed development, including the operational phase:</p> <ul style="list-style-type: none"> <li>• Collaboration between the Developer and local fishing community.</li> <li>• Provide a definition of what is considered the local fishing community.</li> <li>• Create a mechanism to deliver benefits, both to and from, the local fishing ports.</li> <li>• Work collaboratively to deliver enhancements to the local marine environment.</li> <li>• To, in a broad context, enhance the sustainability of the local fishing community.</li> <li>• Establish ways of collaboratively adding value to local seafood produce.</li> </ul> <p>The engagement with the local fisheries around the SFC will commence ahead of construction. Whilst consideration of the potential deliverables of the SFC has already commenced, the full and final detail of the long term aspects to help create a sustainable fisheries in the area will be developed over time. Delivering these broad ranging benefits to the local fishing community as relevant to the proposed development will continue into the operational phase.</p>
<b>Decommissioning</b>	
FMMS	<p>This chapter has concluded significant impacts requiring additional mitigation for Irish demersal otter trawlers targeting Nephrops (<i>Nephrops norvegicus</i>) within the array area during decommissioning. Under the NMPF, where significant impacts are identified, a FMMS should be prepared (Fisheries Policy 2). This is provided as Volume 9 Appendix 16.2.</p> <p>The mitigation measures provided within the FMMS have been developed in consultation with the industry and will continue to be delivered through the FMMS as it remains a live document. The key principles and mitigation details are presented earlier in this table and the measures that are relevant to decommissioning are:</p> <ul style="list-style-type: none"> <li>• <b>The proposed development will provide a Fisheries Liaison Strategy</b></li> <li>• <b>The proposed development will follow the Seafood / Offshore Renewable Energy (ORE) Working Group Summary guidance (Seafood/ORE Working Group, 2023)</b></li> <li>• <b>The proposed development will minimise the size and duration of advisory safety zones during surveys and other works where safe and practicable to do so.</b></li> <li>• <b>Vessels undertaking operations in relation to the proposed development will be working to appropriate safety management systems to ensure safe work practices.</b></li> </ul>



Measure	Mitigation description
	<ul style="list-style-type: none"> <li>Vessels undertaking operations in relation to the proposed development will only undertake activities prescribed in their line of work.</li> <li>Vessels involved in the construction, operation and maintenance and decommissioning of the proposed development, including guard vessels and survey vessels, will be provided with the relevant lines of communication (as outlined within the FMMS) to minimise interaction with fishing vessels undertaking their normal activities.</li> <li>The proposed development will provide a Co-existence Strategy</li> <li>In addition to the commitments above, vessels undertaking operations in relation to the proposed development will be required to follow the mitigation and management measures provided in other documents and management plans committed to by the proposed development. These are referenced within the FMMS and include the VMP, LMP and Offshore EMP.</li> </ul> <p>The FMMS is a live document and will be updated to reflect current (at the time of decommissioning) fishing practices and liaisons to reflect best practice at that point in time.</p>
SFC	<ul style="list-style-type: none"> <li><b>The proposed development will develop and deliver a Sustainable Fisheries Community (SFC)</b></li> </ul> <p>The SFC is a mechanism to deliver long-term proactive fisheries impact mitigation through collaboration and mutual cooperation between the local fishing community and NISA. It is a live document and will be updated to reflect the current fishing ahead of decommissioning commencing, to provide a mechanism for dealing with this transitional phase for the fisheries.</p> <p>The key aim is to establish a SFC focused on the protection and enhancement of a locally sustainable fisheries and marine environment in the waters around the proposed development.</p>

## 5.8 Shipping and Navigation

### 5.8.1 Embedded Mitigation Measures

Table 10 Embedded mitigation measures in relation to shipping and navigation

Measure	Mitigation detail
<b>Construction</b>	
Advisory safe passing distances	Advisory safe passing distances may be deployed around ongoing work being undertaken by a construction or maintenance vessel with notice of these promulgated through Notices to Mariners and Marine Notices (where deemed appropriate).
Buoyed construction area	A buoyed construction area around the array will be implemented during the appropriate phases in agreement with Irish Lights and as outlined in Appendix 17.3: Lighting and Marking Plan (LMP).



Measure	Mitigation detail
Cable protection	Cable protection (burial or external protection) will be implemented and monitored, as determined by a cable burial risk assessment post consent.
Compliance with relevant regulator guidance	The proposed development will be compliant with the relevant regulator guidance noting that the draft version published by DoT is generally aligned with UK Marine Guidance Note (MGN) 654.
Guard vessel(s)	Where appropriate, guard vessels will be used to ensure adherence with advisory passing distances.
Liaison with IRCG in relation to SAR resources	The Developer will liaise with the IRCG in relation to SAR resources to ensure the Emergency Response Cooperation Plan (ERCoP) is in place post consent.
Lighting and marking	Lighting and marking of the array in agreement with Irish Lights and in line with International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) G1162. A separate LMP is provided in Appendix 17.3.
Marine coordination for proposed development vessels	Marine coordination will be implemented to manage proposed development vessels. A separate Vessel Management Plan (VMP) is provided in Appendix 17.2.
Marking on nautical charts	There will be appropriate marking of all offshore infrastructure associated with the offshore development area on UKHO Admiralty charts.
Proposed development compliance with international marine regulations	All proposed development vessels will comply with international marine regulations as adopted by the Flag State including International Regulations for Preventing Collisions at Sea (COLREGs) and International Convention for the Safety of Life at Sea (SOLAS). A separate VMP is provided in Appendix 17.2.
Promulgation of information	Information relating to the proposed development will be circulated via Notices to Mariners and other appropriate media including via the project Fisheries Liaison Officer (FLO) and Marine Notices (where deemed appropriate).
Structure Exclusion Zone	An area within the array area within which no surface piercing structure will be located inclusive of blade overfly. This area will ensure that a minimum 3nm gap between the Rockabill islands and the array is maintained.
<b>Operation</b>	
Advisory safe passing distances	Advisory safe passing distances may be deployed around ongoing work being undertaken by a maintenance vessel with notice of these promulgated through Notices to Mariners and Marine Notices (where deemed appropriate).
Cable protection	Cable protection (burial or external protection) will be implemented and monitored, as determined by a cable burial risk assessment post consent.
Compliance with relevant regulator guidance	The proposed development will be compliant with the relevant regulator guidance noting that the draft version published by DoT is generally aligned with UK Marine Guidance Note (MGN) 654.
Guard vessel(s)	Where appropriate, guard vessels will be used to ensure adherence with advisory passing distances.
Lighting and marking	Lighting and marking of the array in agreement with Irish Lights and in line with International Association of Marine Aids to Navigation and

Measure	Mitigation detail
	Lighthouse Authorities (IALA) G1162. A separate LMP is provided in Appendix 17.3.
Marine coordination for proposed development vessels	Marine coordination will be implemented to manage proposed development vessels during operation. A separate VMP is provided in Appendix 17.2.
Marking on nautical charts	There will be appropriate marking of all offshore infrastructure associated with the offshore development area on UKHO Admiralty charts.
Minimum blade clearance	There will be a minimum blade clearance of more than 22 m above highest Astronomical Tide (HAT) in line with industry good practice and MGN 654. The lowest minimum blade clearance associated with the proposed development is 35m above LAT associated with selected WTGs for Project Option 2.
Proposed development vessel compliance with international marine regulations	All proposed development vessels will comply with international marine regulations as adopted by the Flag State including COLREGs and SOLAS.
Promulgation of information	Information relating to the proposed development will be circulated via Notices to Mariners and other appropriate media including via the FLO and Marine Notices (where deemed appropriate).
Structure Exclusion Zone	An area within the array area within which no surface piercing structure will be located inclusive of blade overfly. This area will ensure that a minimum 3nm gap between the Rockabill islands and the array is maintained. See Figure 17.8.
WTG design and layouts	Consideration will be given to navigational safety and SAR with respect to WTG and layout design (with respect to the 500m LoD), including acceptable levels of SCADA systems.
<b>Decommissioning</b>	
Advisory safe passing distances	Advisory safe passing distances may be deployed around ongoing work being undertaken by a decommissioning vessel with notice of these promulgated through Notices to Mariners and Marine Notices (where deemed appropriate).
Buoyed decommissioning area	A buoyed construction decommissioning area around the array area will be implemented during the appropriate phases in agreement with Irish Lights as outlined in the LMP in Appendix 17.3.
Compliance with relevant regulator guidance	The proposed development will be compliant with the relevant regulator guidance noting that the draft guidance published by the DoT is generally aligned with UK Marine Guidance Note (MGN) 654.
Guard vessel(s)	Where appropriate, guard vessels will be used to ensure adherence with advisory passing distances.
Liaison with IRCG in relation to SAR resources	The Developer will liaise with the IRCG in relation to SAR resources to ensure the ERCoP is in place post consent.
Marine coordination for proposed development vessels	Marine coordination will be implemented to manage proposed development vessels. A separate VMP is provided in Appendix 17.2.

Measure	Mitigation detail
Proposed development vessel compliance with international marine regulations	All proposed development vessels will comply with international marine regulations as adopted by the Flag State including COLREGs and SOLAS.
Promulgation of information	Information relating to the proposed development will be circulated via Notices to Mariners and other appropriate media including via the project FLO and Marine Notices (where deemed appropriate).

### 5.8.2 Mitigation and Monitoring Measures

Mitigation measures that were identified and adopted as part of the evolution of the proposed development design (embedded into the proposed development design) and that are relevant to shipping and navigation are listed in Table 10 and not considered again here. No additional mitigation and monitoring measures specific to shipping and navigation were identified in assessment.

## 5.9 Offshore Archaeology and Cultural Heritage

### 5.9.1 Embedded Mitigation Measures

Table 11 Embedded mitigation measures in relation to offshore archaeology and cultural heritage

Measure	Mitigation detail
<b>Construction</b>	
HDD Installation	Use of HDD to entirely avoid any direct impact from cable corridor preparation and laying within the intertidal zone will decrease the magnitude of impact on these receptors to negligible.

### 5.9.2 Mitigation and Monitoring Measures

Table 12: Mitigation measures in relation to offshore archaeology and cultural heritage

Measure	Mitigation description
<b>Construction</b>	
Archaeological review of geophysical and geotechnical datasets	Additional geophysical and geotechnical surveys will be undertaken prior to construction. In order to identify known and potential / currently unknown archaeological receptors, in line with EPA guidelines (EPA 2022) to facilitate avoidance of impacts (for example, in areas of currently partial geophysical survey coverage such as the array) the archaeological review of the additional geophysical and geotechnical datasets will be undertaken for the footprint of direct and indirect impacts prior to construction, and supporting operation & maintenance and decommissioning stages of the proposed development. The final locations of infrastructure within the 500m Limit of Deviation won't be confirmed until detailed site investigation and detailed design have been undertaken.

Measure	Mitigation description
	<p>The archaeological review of these additional survey data will enhance the design of the final positions of seabed infrastructure (e.g. WTGs, OSP, inter-array cabling) to facilitate avoidance of known and potential archaeological receptors.</p> <p>This mitigation applies to direct and indirect physical disturbance of archaeological receptors.</p>
<p>Archaeological Exclusion Zones (AEZs)</p>	<p>The main mitigation for the protection of known archaeological receptors is avoidance, in line with EPA guidelines (EPA 2022). The implementation and monitoring of Archaeological Exclusion Zones (AEZs) achieves this for the identified high value offshore archaeology and cultural heritage receptors.</p> <p>This mitigation applies to direct and indirect physical disturbance of archaeological receptors.</p>
<p>Protocols for Archaeological Discoveries (PAD)</p>	<p>A PAD is a system for reporting and investigating unexpected archaeological discoveries encountered during the different phases of the proposed development, with a Retained Archaeologist providing guidance and advising industry staff on the implementation of the PAD. A PAD also makes provision for the implementation of temporary exclusion zones around areas of possible archaeological interest, for prompt archaeological advice, and, if necessary, for archaeological inspection and recording of important features prior to further activities in the vicinity. The PAD provides a mechanism to comply with legislation, including notification to the NMS.</p> <p>This mitigation applies to direct and indirect physical disturbance of archaeological receptors. The PAD is captured within the Offshore EMP.</p>
<p><b>Operation</b></p>	
<p>AEZs</p>	<p>The main mitigation for the protection of known archaeological receptors is avoidance, in line with EPA guidelines (EPA 2022). The implementation and monitoring of Archaeological Exclusion Zones (AEZs) achieves this for the identified high value offshore archaeology and cultural heritage receptors.</p> <p>This mitigation applies to direct and indirect physical disturbance of archaeological receptors.</p>
<p>PAD</p>	<p>A PAD is a system for reporting and investigating unexpected archaeological discoveries encountered during the different phases of the proposed development, with a Retained Archaeologist providing guidance and advising industry staff on the implementation of the PAD. A PAD also makes provision for the implementation of temporary exclusion zones around areas of possible archaeological interest, for prompt archaeological advice, and, if necessary, for archaeological inspection and recording of important features prior to further activities in the vicinity. The PAD provides a mechanism to comply with legislation, including notification to the NMS.</p> <p>This mitigation applies to direct and indirect physical disturbance of archaeological receptors. The PAD is captured within the Offshore EMP.</p>
<p><b>Decommissioning</b></p>	
<p>AEZs</p>	<p>The main mitigation for the protection of known archaeological receptors is avoidance, in line with EPA guidelines (EPA 2022). The implementation and monitoring of Archaeological Exclusion Zones (AEZs) achieves this for the identified high value offshore archaeology and cultural heritage receptors.</p> <p>This mitigation applies to the direct disturbance of archaeological receptors.</p>

Measure	Mitigation description
PAD	<p>A PAD is a system for reporting and investigating unexpected archaeological discoveries encountered during the different phases of the proposed development, with a Retained Archaeologist providing guidance and advising industry staff on the implementation of the PAD. A PAD also makes provision for the implementation of temporary exclusion zones around areas of possible archaeological interest, for prompt archaeological advice, and, if necessary, for archaeological inspection and recording of important features prior to further activities in the vicinity. The PAD provides a mechanism to comply with legislation, including notification to the NMS.</p> <p>This mitigation applies to the direct disturbance of archaeological receptors.</p>

## 5.10 Aviation and Radar

### 5.10.1 Embedded Mitigation Measures

Table 13 Embedded mitigation measures in relation to aviation and radar

Measure	Mitigation description
<b>Construction</b>	
Compliance with IAA lighting and marking requirements	The offshore infrastructure would be designed and constructed in accordance with the requirements of the IAA and the Commissioners of Irish Lights (CIL) in terms of the notification, charting, marking and lighting of obstacles in order to protect air and marine navigation. Refer to Section 19.4.5.1. for further details and Volume 9, Appendix 17.3: Lighting and Marking Plan.
Compliance with IAA requirements for the promulgation of obstacle locations	At least three months before the erection of offshore infrastructure, the required obstacle parameters will be supplied to the IAA and the CIL. Refer to Section 19.4.5.2 for further details.
WTG design parameters within aviation restricted zone	Project Option 2 WTGs within the 3nm buffer areas of Dublin Airport's ATCSMAC sectors 1 and 2 will have a reduced air draft and corresponding reduced tip height of 311m above LAT. This is to ensure that the minimum required obstacle clearances of sectors 1 and 2 are not infringed.
Compliance with relevant regulator guidance (MGN 654 requirements)	The proposed development will be compliant with the relevant regulator guidance noting that the draft version published by DoT is generally aligned with UK Marine Guidance Note (MGN) 654. Refer to Volume 3, Chapter 17: Shipping and Navigation for further details.
Consultation with the DoD Adherence to DoD issued NOTAMs and NtMs, and DoT issued Marine Notices	Prior to installation of the offshore export cable, engagement will be undertaken with the DoD and the following of NOTAMs, NtMs and Marine Notices relating to Gormanston Danger Area EID1 will ensure that installation schedules do not conflict with IAC firing range activities.
<b>Operation</b>	

Measure	Mitigation description
Compliance with IAA lighting and marking requirements	The offshore infrastructure would continue to be lit during operation in accordance with the requirements of the IAA and the CIL in terms of the notification, charting, marking and lighting of obstacles in order to protect air and marine navigation. Refer to Section 19.4.5.1. for further details and Appendix 17.3.
Compliance with IAA requirements for the promulgation of obstacle locations	Within three months of construction completion, updated obstacle information will be supplied to the IAA and the CIL. Refer to Section 19.4.5.2 for further details.
WTG design parameters within aviation restricted zone	Project Option 2 WTGs within the 3nm buffer areas of Dublin Airport's ATCSMAC sectors 1 and 2 will have a reduced air draft and corresponding reduced tip height of 311m above LAT.
Compliance with MGN 654 requirements	The fixed layouts for Project Option 1 and Project Option 2 comply with MGN 654 requirements with regards to SAR emergency access to the array area.
<b>Decommissioning</b>	
Compliance with IAA lighting and marking requirements	The offshore infrastructure would continue to be lit through the decommissioning phase in accordance with the requirements of the IAA and the CIL in terms of the notification, charting, marking and lighting of obstacles in order to protect air and marine navigation. Refer to Section 19.4.5.1. for further details and Appendix 17.3.
Compliance with IAA requirements for the promulgation of obstacle locations	Updated relevant information will be supplied to the IAA and the CIL, as detailed in Section 19.4.5.2.
WTG design parameters within aviation restricted zone	Project Option 2 WTGs within the 3nm buffer areas of Dublin Airport's ATCSMAC sectors 1 and 2 will have a reduced air draft and corresponding reduced tip height of 311m above LAT.
Compliance with MGN 654 requirements	The fixed layouts for Project Option 1 and Project Option 2 comply with MGN 654 requirements with regards to SAR emergency access to the array area.
Assessment of impacts and best practice environmental management	Prior to decommissioning a study of the potential impacts to aviation and radar receptors from the proposed decommissioning activities would be undertaken, considering the baseline environment at the pre-decommissioning stage. All mitigation measures to be captured would be captured within the decommissioning strategy within the Offshore EMP. Any licences or authorisations that might be required would be identified and obtained prior to decommissioning, including any validation, updating or new submission of an EIAR, as required.

### 5.10.2 Mitigation and Monitoring Measures

Mitigation measures that were identified and adopted as part of the evolution of the proposed development design (embedded into the proposed development design) and that are relevant to



aviation and radar are listed in Table 13. Effects during construction, operation and decommissioning are not considered to be significant, therefore no further mitigation or monitoring measures are considered necessary.

## 5.11 Infrastructure and Other Users

### 5.11.1 Embedded Mitigation Measures

Table 14 Embedded mitigation measures in relation to infrastructure and other users

Measure	Mitigation detail
<b>Construction</b>	
Pre-construction surveys	Pre-construction surveys will be carried out that involve geophysical and magnetometer surveys used to identify existing assets. This may include out of service cables located in a different area to their chartered location due to outdated location techniques, which will reduce the risk of direct impacts or damage to subsea cables and pipelines during construction.
Structure Exclusion Zone	As part of managing potential impacts to shipping and navigation, the proposed development has incorporated a Structure Exclusion Zone, into the design. This is an area within the array which excludes all surface infrastructure (inclusive of blade overfly) and enables a 3nm separation between surface infrastructure and the Rockabill islands to be maintained. This gap between the array area and the Rockabill islands is referred to as the Rockabill gap and provides sea room to facilitate the safe passage of vessels. Additionally, it is anticipated that potential other users of the Rockabill gap will be able to safely navigate in the presence of other activities.
Advisory safety zones	Advisory safety zones of up to 500m around infrastructure under construction will be communicated during construction. Where appropriate, guard vessels and/or guard buoys will also be used to ensure adherence to advisory safety zones or advisory passing distances, as defined by risk assessment, to mitigate any impact which poses a risk to surface navigation during construction. An advisory safety zone of 50m will be implemented for incomplete structures at which construction activity may be temporarily paused.
Advanced vessel warnings	Details of the proposed development will be promulgated in advance of construction, via Notice to Mariners (NtM) to ensure mariners are aware of the planned works. This information will include associated advisory safety zones and advisory passing distances.
Updated nautical charts	The provision of relevant data and information will be provided to the relevant authorities/charting bodies for the updating of nautical and electronic charts.
Consultation with the DoD Adherence to DoD NtMs and/or Marine Notices	Prior to installation of the export cable, engagement will be undertaken with the DoD and the following of, NtMs (and/or Marine Notices) relating to Gormanston Danger Area EID1 will ensure that installation schedules do not conflict with Irish Air Corps (IAC) firing range activities.
Cable burial and cable protection measures	Exposed and/or inappropriately managed cables may potential impact on vessels looking to anchor within proximity to the offshore development area. Export and inter-array cables will be buried where practicable to ensure they are not exposed by sediment movements (Section 8.3.10 in the Offshore Construction



Measure	Mitigation detail
	<p>Strategy). Where cables cannot be buried, additional cable protection measures such as rock placement or mattressing will be applied to achieve adequate cable protection. Up to 20% of cable length is expected to need protection either during initial installation, or throughout the operational phase of the proposed development (see the Offshore Construction Strategy).</p> <p>Cable specification and installation measures are determined within the offshore Environmental Management Plan (EMP) and include a detailed Cable Burial Risk Assessment (CBRA) to enable informed judgements regarding burial depth to increase the likelihood of cables remaining buried whilst limiting the amount of sediment disturbance to that which is necessary. This sets out appropriate cable burial depth in accordance with industry good practice, reducing the risk of cable exposure.</p> <p>A cable burial risk assessment (CBRA) will be developed that will set out the appropriate installation methods to be used during the construction phase. During construction, sections of export cable might be left exposed whilst awaiting a suitable method of installation. A temporary exclusion zone may therefore be required until the cable can be buried.</p>
Vessel route management	<p>Indicative transit corridors (vessel routing to and from construction sites and ports) will be define in advance of the construction phase, in consultation with the Marine Survey Office (MSO). A vessel management plan (VMP) will be implemented and will include a code of conduct for vessel operators. These measures will reduce the risk of disturbance and displacement of with infrastructure and other users.</p> <p>The VMP is provided in Appendix 17.2 and will be updated through the phases of the proposed development.</p>
Marine pollution contingency measures – chemical risk review	<p>Marine pollution contingency measures will be implemented as part of the offshore EMP to manage the risk of accidental spillages from construction equipment or collision incidents. This includes a chemical risk review with information regarding how and when chemicals are to be used, stored and transported in accordance with recognised best practice guidance. This measure will reduce the likelihood of potentially harmful pollutants to be released into the marine environment which may then impact on fish and shellfish receptors.</p>
<b>Operation</b>	
Structure Exclusion Zone	<p>The proposed development design has incorporated a Structure Exclusion Zone, an area within the array which excludes all surface infrastructure (inclusive of blade overfly) and enables a 3nm separation between surface infrastructure and the Rockabill islands to be maintained. This gap between the array area and the Rockabill islands is referred to as the Rockabill gap and provides sea room to facilitate the safe passage of vessels. Additionally, it is anticipated that potential other users of the Rockabill gap will be able to safely navigate in the presence of other activities.</p>
Advanced vessel warnings	<p>Details of the proposed development will be promulgated in advance of any work that is not routine during operation via NtM to ensure mariners are aware of the planned works. This information will include associated advisory safety zones and advisory passing distances.</p>
Advisory safety zones	<p>Advisory safety zones of up to 500m around the relevant infrastructure will be communicated during substantial maintenance activities (such as major component replacement). Where appropriate, guard vessels and/or guard buoys will also be used to ensure adherence with advisory safety zones or advisory passing distances, as defined by risk assessment, to mitigate any impact which poses a risk to surface navigation</p>

Measure	Mitigation detail
	<p>during construction, maintenance and decommissioning phases. Such risks may include partially installed structures or cables, extinguished navigation lights or other unmarked hazards.</p> <p>An advisory safety zone of 50m will be implemented for incomplete structures at which construction activity may be temporarily paused.</p>
Updated nautical charts	The provision of relevant data and information will be provided to the relevant authorities/charting bodies as/if required for the updating of nautical and electronic charts.
Consultation with the DoD Adherence to DoD issued NtMs and/or Marine Notices	Prior to management or repair of the offshore export cable, engagement will be undertaken with the DoD and the following of NtMs (and/or Marine Notices) relating to Gormanston Danger Area EID1 will ensure that installation schedules do not conflict with IAC firing range activities.
<b>Decommissioning</b>	
Structure Exclusion Zone	The proposed development incorporated a Structure Exclusion Zone, an area within the array which excludes all surface infrastructure (inclusive of blade overfly) and enables a 3nm separation between surface infrastructure and the Rockabill islands to be maintained. This gap between the array area and the Rockabill islands is referred to as the Rockabill gap and provides sea room to facilitate the safe passage of vessels. Additionally, it is anticipated that potential other users of the Rockabill gap will be able to safely navigate in the presence of other activities.
Advanced vessel warnings	<p>Details of the proposed development will be promulgated in advance of decommissioning via NtM to ensure mariners are aware of the planned works.</p> <p>This information will include associated advisory safety zones and advisory passing distances.</p>
Advisory safety zones	<p>Advisory safety zones of up to 500m around the relevant infrastructure will be communicated during decommissioning. Where appropriate, guard vessels and/or guard buoys will also be used to ensure adherence with advisory safety zones or advisory passing distances, as defined by risk assessment, to mitigate any impact which poses a risk to surface navigation during decommissioning. Such impacts may include partially installed structures or cables, extinguished navigation lights or other unmarked hazards.</p> <p>An advisory safety zone of 50m will be implemented for incomplete structures at which construction activity may be temporarily paused.</p>
Updated nautical charts	The provision of relevant data and information will be provided to the relevant authorities/charting bodies for the updating of nautical and electronic charts.
Consultation with the DoD Adherence to DoD issued NtMs and/or Marine Notices	Prior to decommissioning of the offshore export cable, engagement will be undertaken with the DoD and the following of NtMs (and/or Marine Notices) relating to Gormanston Danger Area EID1 will ensure that installation schedules do not conflict with IAC firing range activities.

Measure	Mitigation detail
Assessment of impacts and best practice environmental management	Prior to decommissioning a study of the potential environmental impacts to infrastructure and other users from the proposed decommissioning activities should be undertaken, taking into account the baseline environment at the pre-decommissioning stage. All mitigation measures to be captured would be captured within the decommissioning strategy within the Offshore EMP. Any licences or authorisations that might be required would be identified and obtained prior to decommissioning, including any validation, updating or new submission of an EIAR, as required.

### 5.11.2 Mitigation and Monitoring Measures

Mitigation measures that were identified and adopted as part of the evolution of the proposed development design (embedded into the proposed development design) and that are relevant to I&OU are listed in Table 14. No additional mitigation and monitoring measures specific to infrastructure and other users were identified in assessment.

## 5.12 Offshore Bats

### 5.12.1 Embedded Mitigation Measures

There are no embedded mitigation measures that have been included within the proposed development design that are specific to the reduction of impacts and effects on offshore bats as their presence is uncertain. However, those measures that have been implemented through the design development process to reduce impacts on birds (refer to the Ornithology Chapter) may potentially benefit offshore bats, should they be present within the array area. This includes the reduction in the size of the array area, from the extent of the MAC boundary, and the increase in lowest blade tip height above LAT. These elements have been considered within the parameters for assessment.

### 5.12.2 Mitigation and Monitoring Measures

Significant effects cannot be ruled out, due to the precautionary principle, in relation to impacts due to collision and barotrauma on the inferred bat population at Rockabill based on the current baseline. Further monitoring is required as set out Volume 3, Chapter 35: Offshore Bats. No further mitigation is proposed at this time.

## 6. Training and Awareness

### 6.1 Overview

The Developer will ensure that Contractors and Subcontractors have appropriate environmental management resources and procedures in place. The Developer's Environmental Manager will evaluate Contractor compliance with environment and consents requirements and will review appointed contractor documentation to ensure compliance with the EMP. Risk Assessment and

Method Statements (RAMS) will be submitted 10 days prior to the start of works for approval by the Environmental Manager, no works can commence until the RAMS are approved.

During construction, the Environmental Manager is responsible for delivering environmental training and promoting awareness in relation to environmental management through various means including;

- Inductions;
- Toolbox talks
- Awareness materials (e.g. Environmental notices, Marine Notices, Notice to Mariners) ; and
- Onsite audits

The Developer's Environmental Manager will review all training documentation, before it's delivered.

The Environmental Manager will ensure that a dedicated section is included within wider contractor project inductions for the proposed development to cover environment and consents issues, highlighting the key environmental sensitivities and considerations. All Developer personnel, Contractors and Subcontractors will receive a project induction.

The Environmental Manager will also deliver specific training on the purpose, requirements and procedures of the EMP and associated Annexes, through a series of toolbox talks. Toolbox talks will be designed to convey key points to project personnel in a clear and concise manner (IEMA, 2008). Toolbox talks will also be scheduled, and delivered by specific personnel such as the ECoW/MMO/PAM operator, in advance of specific construction or operational and maintenance activities (for example, piling activities), identifying specific control measures and mitigation requirements.

In addition to presentations and talks, the Environmental Manager will prepare a series of awareness materials, which may include training packs, posters, signs and newsletters. The delivery of material shall be coordinated with the Contractors to ensure best use of any training opportunity.

Training will take place regularly throughout the lifetime of the proposed development in order that project personnel (including any new personnel) are kept up to date with any changes to requirements or procedures. A record of the training will be maintained by the Developer's Environmental Manager.

The Developer's Environmental Manager will assume responsibility for the provision of environmental training and promoting awareness to project personnel during the operational and maintenance phase of the proposed development. The Developer's Environmental Manager may delegate these responsibilities to a Contractor, if appropriate, during the operational and maintenance phase of the proposed development.

## 6.2 Personnel Induction Procedure

All personnel working on site/vessels will have a site/vessel induction that details the importance of good environmental practice and inform them of the environmental sensitivities of the area during construction of the proposed development. Induction records will be retained and made available to the Developer upon request.

At minimum, the environmental component of the site induction shall cover the following items:

- Key contacts of environmental responsibility;
- Environmental documentation of relevance (e.g. Environmental Management Plan, Dropped Objects procedure etc.);
- Environmental aspects and impact issues associated with the scope of work;
- Key mitigation measures employed;
- Environmental regulatory requirements; and
- Environmental incident, complaint and emergency reporting and response processes.

Daily/weekly briefings will provide specific information to personnel involved in certain activities. These talks will highlight environmental risks and confirm control measures to implement so as to mitigate the likelihood of the work impacting on the environment. Records of attendees will be retained and must be made available to the Developer upon request.

Subjects of relevance to the offshore works for inclusion within toolbox talks may comprise, but are not limited to:

- The pile driving procedure and associated mitigation protocols (i.e. Marine Mammal Monitoring Plan (MMMP));
- Archaeological Exclusion Zones (AEZs) and the necessary mitigation measures to be followed;
- Dealing with oil and chemical spills;
- Type of spill kits and their use;
- Storage and handling of hazardous material (according to Control of Substances Hazardous to Health (COSHH));
- Minimising waste;
- Waste separation, appropriate storage and Duty of Care;

- General good environmental actions and 'house-keeping';
- Environmental Incident Reporting; and
- Other consent constraints and considerations that a package of works may require to consider.

### 6.3 Environmental Notices

At least one environmental notice board will be present on each vessel to display copies of relevant environmental management information, which may include but are not limited to:

- The Developers Environmental Policy;
- Key Contacts and details;
- Contractors Environmental Policy;
- Relevant Environmental Notices or alerts;
- Site plans including locations of ecologically/archaeologically sensitive areas; and
- Emergency Response Flowcharts including contact details.

### 6.4 Monitoring, Auditing and Reporting

To ensure compliance with this EMP and associated consent documentation, the Developer and its contractors will develop a monitoring programme for the proposed development, which will comprise both inspections and audits. Observations from inspections and audits shall be collected, recorded in inspection or audit template reports, issued to contractors for closure of actions. The close out of these items will be required within designated timeframes. Each contractor working on the proposed development must maintain adequate records of environmental information and audits to demonstrate compliance with both legal and the Developer's environmental requirements. The Developer will assess compliance with relevant environmental legislation and consent commitments as part of the proposed developments monitoring programme.

Audits will focus on compliance with this EMP and will be completed by the Developer on key construction packages. Audits will be agreed and arranged with the contractors at least 4 weeks in advance and prior to any vessel mobilising to the project. All actions raised from the audit will be recorded by the Developer and the contractors must address and close out actions in a timely manner.

A monthly report will be required from each contractor and sub-contractor which will be recorded and monitored by the Developer. Required Data will be as follows:

- Environmental Near Miss Incidents

- Environmental Incidents
- Notice from Regulatory Authority
- Confirmed Environmental Complaint

Compliance with the EMP will be monitored through a series of audits carried out by the Environmental Manager (where appropriate) throughout the construction and operational and maintenance phases. This will include a scheduled audit following the delivery of a toolbox talk, to ensure that the requirements and procedures have been understood. This may involve site visits and conversations with project personnel to monitor awareness. The Environmental Manager (where appropriate) will develop specific checklists, informed by review of this EMP and Contractor RAMS, to facilitate the audit process.

The following environmental audits will be completed:

- The Developer may carry out audits at any time, but at least once per quarter;
- During construction, the Environmental Manager will undertake environmental audits on a monthly basis and will maintain a record of all completed audit forms, and records of corrective action and close outs; and
- The Environmental Manager will also undertake audits of sub-Contractors, on a quarterly basis and provide an audit report to the Developer's Environmental Manager within 2 weeks of the audit being undertaken.

Details and findings of all monitoring and audit activities will be recorded. Any observations or corrective actions arising from audits and inspections will be addressed, with procedures updated in this EMP as required.

The Environmental Manager will be delegated sufficient powers under the construction contract so that they will be able to instruct the Contractor to stop works and to direct the carrying out of emergency mitigation / clean-up operations.

The Applicant will also have stop works authority, in the event of a non-conformance identified during an external audit.

## 7. Communications

### 7.1 Communication and Engagement

#### 7.1.1 Internal Communication

- The Contractors will put in place an Internal Communication Strategy which will include procedures for effective internal communications. The strategy, which will be finalised



by the contractor(s) will include measures such as the following: A site management meeting which will include environmental issues on the agenda;

- The Environmental Manager will report on environmental issues to the site management meetings; and
- The Environmental Manager will attend the weekly meetings.

### 7.1.2 Community Liaison and Stakeholder Liaison

The Developer will take all reasonable steps to engage with stakeholders in the local community, focusing on those who may be affected by the construction works including residents, businesses, community resources and specific vulnerable groups.

This function will be led by a dedicated Community Liaison Officer (CLO), who currently represents the Developer.

The Developer will establish a Communications Management Plan, which will specify the approach and protocol in relation to community and stakeholder engagement which the contractor(s) must support and adhere to.

Communication with the local community and other relevant stakeholders will be undertaken at an appropriate level and frequency throughout construction.

The Developer recognises the importance of effective community liaison in order to reduce nuisance to relevant stakeholders, to ensure public safety and welfare and to help ensure the smooth running of construction activities. Important actions in ensuring good relations are:

- Early engagement with communities to build awareness of construction elements;
- Providing frequent and detailed information for the public both in advance and during construction (particularly nearby sensitive receptors);
- Providing the correct points of contact and being responsive; and
- The implementation of a 'good neighbour' policy, as far as possible. Key aspects of this policy include:
  - Early implementation of the policy i.e. from the commencement of construction;
  - Reduction of nuisance factors;
  - Maintaining access to neighbouring premises;
  - Clear and concise information; and
  - Undertaking timely liaison with stakeholders.

### 7.1.3 External Communications

The Developer, supported by the contractor(s), will facilitate regular consultation in accordance with the specifications and cooperate with this Plan. The Developer will carry out external communications, notifications (such as NtM) and reporting in relation to proposed development activities in line with the commitments made in the EIAR and in compliance with the requirements of the consent conditions.

Details of the available communication channels/points of contact for members of the public to contact the FLO, the ECoW and the contractor(s) during construction will be established in advance of the commencement of construction and displayed around working areas.

#### 7.1.4 Advance Notice of Works

The Developer, with the support of the contractor(s) will ensure that local residents, businesses, occupiers, general users of the area and stakeholders are informed in advance of construction activities that may affect them. Relevant obligations and procedures in relation to advance notice of works will be identified in the Communications Management Plan.

All notifications will detail the nature, estimated duration and working hours. All notifications will include a project-specific contact number to which any enquires can be directed. The developer, with the support of the contractor(s) will be responsible for preparing and issuing the notifications subject.

## 7.2 Environmental Complaints

The developer with the support of the contractor(s) will establish a process for handling all enquiries, including complaints. All enquiries will be recorded, and a log will be maintained to include details of the response and action taken. This will be available upon request for inspection to statutory stakeholders. All enquiries, whether a query or a complaint, will be dealt with in a timely manner.

The ECoW/FLO will be immediately informed of any environmental-related issues that have been raised. Where appropriate, the ECoW/FLO in consultation with the Developer, will be responsible for informing relevant stakeholders and statutory bodies.

## 7.3 Incident Reporting

See Appendix 2 for emergency incident procedures as it pertains to reporting. Appendix 2 details reporting procedures as it pertains to marine pollution.

## 7.4 Dropped Objects

In the course of operations objects may be dropped in the marine environment. Dropped objects will be reported in line with the requirements of the Maritime Usage Licence (MUL). Refer to Appendix 4 for full details.

## 8. Environmental Control Measures

The following sections provide an overview of the environmental control measures that will be followed during the relevant phases of the proposed development. Where appropriate they reference to an appendix or additional standalone plans for further detail on those measures which must also be adhered to.

### 8.1 Marine Pollution and Contingency Planning

Appendix 1 this Offshore EMP provides the key principles of how the Developer intends to manage marine pollution and contingency planning.

### 8.2 Marine Species

In the unlikely event that a wildlife incident occurs, such as injury to a marine mammal, or an observed fish or bird mortality, the Contractor or responsible member of staff will notify the Developer's Environmental Manager or Offshore ECoW as soon as practicable (e.g. in accordance with the Environmental VMP), with details of the activity taking place, photographs, and weather conditions present as a minimum. The Developer's Environment Manager or the Offshore ECoW will follow up with the relevant regulatory authority, as required. See section Appendix 2 of this document, for further details on the Environmental Incident Reporting Procedure.

Other mitigation and management measures relevant to encountering marine wildlife are contained in the following documents:

- Marine Mammal Mitigation Protocol (Volume 9; Appendix 14.4); and
- Environmental Vessel Management Plan (Volume 9; Appendix 14.5).

### 8.3 Marine Archaeology

#### 8.3.1 Archaeological Exclusion Zones

AEZs will be implemented for these receptors within the offshore development area or where an AEZ around a receptor outside the offshore development area would encroach on the offshore development area. These are illustrated in Figure 18.5 of the Offshore Archaeology and Cultural Heritage Chapter and are as follows:

- for all receptors assigned a high value which may be impacted, an AEZ of 100m buffer is required: defined around the extent of the feature if mapped, or otherwise a central location or the reported position as appropriate; and
- for all receptors assigned a high value discrimination rating but which have no potential for impact due to being outside the offshore development area no AEZ is required.

Table 15: AEZs within the offshore development area

Site ID	Description	UTM30N Easting	UTM30N Northing	Recommended AEZ buffer
WA7000	High value, potential for impact	289332	5946816	100m
WA7001	High value, potential for impact	289796	5946725	100m
WA7002	High value, potential for impact	297073	5949027	100m
WA7003	High value, no potential for impact	297403	5947223	None: outside the ECC boundary by c.450m
WA7004	High value, no potential for impact	297387	5947239	None: outside the ECC boundary by c.450m
WA7005	High value, no potential for impact	298783	5947415	None: outside the ECC boundary by c.450m
WA7006	High value, potential for impact	299034	5948785	100m
WA7007	High value, potential for impact	302666	5951085	100m
WA7008	High value, potential for impact	303126	5951304	100m
WA7009	High value, potential for impact	311154	5944559	100m
WA7010	High value, potential for impact	299052	5948791	None, covered by AEZ for WA7006
WA7011	High value, potential for impact	299029	5948771	None, covered by AEZ for WA7006
WA7012	High value, potential for impact	302665	5951077	None, covered by AEZ for WA7007
WA7013	High value, potential for impact	303061	5951326	100m

### 8.3.2 Protocol for Archaeological Discoveries

The procedure to be followed on discovering any marine archaeology during the construction, operation and decommissioning phases of the proposed development are set out in the Archaeological Management Procedures (Appendix 6).

## 8.4 Vessel Management and Other Marine Users

The approach to vessel management and mitigation of potential impacts on shipping, navigation and other marine users are set out in the following plans;

- Vessel Management Plan (Volume 9, Appendix 17.2);
- Lighting and Marking Plan (Volume 9, Appendix 17.3); and
- Fisheries Mitigation and Management Strategy (Volume 9, Appendix 16.2).

Specific measures covered by these plans include:

- The adoption of advisory safety zones;
- Appropriate notification of activities to other marine users;
- A clear process of marine coordination of all vessels and vessel activity;
- Appropriate marking and lighting of vessels;
- Appropriate marking and lighting of the proposed development; and
- Vessel transit planning, commercial fisheries relations and management of commercial fisheries interactions.

## 8.5 Marine Invasive Non-Native Species

The procedure to be followed for the management of marine invasive non-indigenous species during the construction and operational and maintenance phases of the Proposed Development is set out in the Invasive Non-Indigenous Species Management Procedure (see Appendix 4).

Following legislative requirements and guidance, specific measures that will be adopted by Contractors and Subcontractors are as follows:

- All relevant vessels (400 gross tonnes (GT) or more, and those certified to carry 15 or more persons) to carry an International Anti-fouling System Certificate (AFS), in accordance with the Sea Pollution (Control of Harmful Anti-fouling Systems on Ships) Regulations 2008, for the purpose of giving effect to the International Convention on the Control of Harmful Anti-fouling Systems on Ships 2001;

- All vessels of 24 metres or more (but less than 400 GT) must carry a declaration on AFS, signed by the owner or authorised agent, and accompanied by appropriate documentation;
- All ship hull inspections and biofouling management measures shall be documented by the Contractors (and their sub-Contractors), and recorded;
- All submersible equipment, for instance, ROVs, shall be subject to documented pre-mobilisation and post-use checks, for the presence of marine growth, to ensure that equipment is free of marine growth prior to and post-use;
- All ships of 400 GT and above will be required to have onboard an approved Ballast Water Management Plan (BWMP) and Ballast Water Record Book. They must also be surveyed and issued with an International Ballast Water Management Certificate. Vessels of less than 400 GT shall meet the requirements of the BWM Convention; and
- Meet any agreed timescales for BWM Convention compliant Ballast Water Treatment Systems (BWTS) to be installed on relevant vessels (in line with vessel types and their International Oil Pollution Prevention re-certification dates).

## 8.6 Waste Management

### 8.6.1 General Waste Management Measures

During construction, the Developer requires that all Contractors (and their Sub-Contractors) comply with the Offshore Waste Management Procedure (Appendix 5) and Chapter 31: Resource and Waste Management, which provides details of all waste management procedures for activities and details of expected waste arisings. The Environmental Manager will be responsible for compliance with this document.

Prior to commencement of the works, the Environmental Manager will confirm compliance with the Waste Management Procedure to Project Director.

The Environmental Manager will be responsible for ensuring this document is maintained during the operational and maintenance, and decommissioning phase of the Proposed Development.

### 8.6.2 Offshore Waste Management Measures

Appendix 5 of this Offshore EMP provides the key principles of how the Developer intends to manage offshore waste during construction and throughout operation.

## 8.7 UXO Management Measures

During the construction of offshore wind farms in Europe, there is potential to encounter UXO originating from historical military action or modern munitions. This poses a health and safety risk where it may be located at or near the planned location of infrastructure and associated vessel activity, and therefore it is necessary to survey for and manage this risk.

Studies to date indicate the array area to be low risk and one area within the ECC near the coast in the southwest is considered medium risk of encountering UXOs. (Alpha Associates, 2021)

If UXOs are found, depending on their nature, they can be avoided by rerouting / relocating cables or foundations. If that is not technically feasible, high-order detonation; low-order deflagration; removal/ relocation; and other less intrusive means of neutralising the UXO may be employed. A case-by-case risk assessment will be undertaken following dedicated geophysical surveys..

Where a target is confirmed as non-UXO the device may be recovered for onshore disposal where practicable.

The impact of detonating in situ on marine species has been assessed and appropriate mitigation measures and controls are provided in the Marine Mammal Mitigation Protocol (Volume 9; Appendix 14.4).

## 8.8 Decommissioning Strategy

The exact approach to decommissioning will be confirmed at a later stage in the lifetime of the project but well in advance of any decommissioning activities and in accordance with any legislative requirements and consent conditions. Approval from the relevant authorities will be sought once decommissioning approaches and programmes begin to be developed and detailed decommissioning proposals will be prepared and submitted for approval as part of this process. For decommissioning, it is anticipated that the following approaches might be included within these proposals:

1. All structures above the seabed will be completely removed.
2. Piled foundations will be cut approximately 1m - 2m below the seabed and removed, with due consideration made of likely changes in seabed level across the array area (it is not thought to be reasonably practicable to remove entire piles from the seabed, as this may cause damage to the seabed environment, but endeavours will be made to ensure that the sections of pile that remain in the seabed are fully buried and made safe to ensure they do not become to stop protrusions and hazards).
3. Any scour protection will be left in situ and would only be removed if it was less impactful to do so.
4. Where appropriate, buried assets such as cables will be left in situ - Where discussions with stakeholders and regulators identify the need for cables to be wholly or partially removed, this would require the removal of seabed material or cable protection measures to allow access. Cable ends would be weighted and returned to the seabed and securely buried. The rock protection or concrete mattresses over the cables will only be displaced as much as necessary to remove the cables if requested by the authorities to do so at the time.
5. In the intertidal area, the export cables will be left in place in the seabed with the cable ends cut, sealed and securely buried.

Appendix 8 of this Offshore EMP provides a strategy of how the Developer intends to manage the decommissioning of the proposed development.



## 8.9 Rehabilitation Schedule

As a requirement of the Section 96(1) of the Maritime Area Planning Act 2021 (“MAP Act”), a Rehabilitation Schedule is required for the proposed development and this is provided within Volume 9, Appendix 8.2. This document provides the details of the proposed programme of rehabilitation and an outline approach to rehabilitation for each of the relevant topics or receptors which would meet the requirements set out in Section 96 of the MAP Act.

The proposed programme of rehabilitation is summarised as follows:

- Review of monitoring outcomes from the pre-construction, post-construction and operational period.
- Undertake pre-decommissioning survey/s to confirm the state (condition) of relevant receptors (i.e. seabed, water quality, wildlife, natural habitats, landscape and seascape).
- Consult with relevant stakeholders to agree the appropriate rehabilitation actions accounting for the monitoring and survey outcomes. As set out in section 96(2) of the MAP Act, this may be or include one or more than one of: decommissioning; removal; partial removal; re-use; burying or encasing of infrastructure; or the removal of any deposited or waste material.
- Confirm the decommissioning requirements (as outlined in Appendix 8.2) and which must take account of this Rehabilitation Schedule to achieve restoration to a satisfactory state, or to enable reuse.
- Where any such restoration has been completed, a further programme of post-decommissioning monitoring will be agreed with the relevant authorities and undertaken to confirm any other actions necessary to maintain it in a satisfactory state.

## 9. References

Cook, E.J., Macleod, A. Payne, R.D., and Brown, S. (2014) edited by Natural England and Natural Resources Wales (2015) Marine Biosecurity Planning – Guidance for producing site and operation-based plans for preventing the introduction and spread of non-native species in England and Wales.

The International Convention on the Control of Harmful Anti-Fouling Systems on Ships (AFS Convention) (2001)

International Convention for the Control and Management of Ships’ Ballast Water and Sediments (BWM Convention) (2004)

## APPENDIX 1 – Marine Pollution Contingency Procedure

### Introduction

This Marine Pollution Contingency Procedure (MPCP) sets out the measures to protect project personnel and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to the proposed development.

This procedure has been prepared by the Developer to set out emergency response plans including cooperation procedures with the Irish Coastguard (IRCG) for the construction, operation and decommissioning phases of the Proposed Development.

Copies of this MPCP are to be held in the following locations:

- Developer Head Office
- At the premises of any agent, Key Contractor or Subcontractor acting on behalf of the Developer;
- All site offices dealing with marine operations;
- All vessels involved in Construction and Operation and Maintenance activities; and
- With the ECoW(s).

### Roles and Responsibilities

#### Developer

In the event of an emergency associated with the proposed development, or at sea involving its personnel and/or vessels, the Developer is responsible for providing immediate rescue and first aid medical response, to a level appropriate for the circumstances of the proposed development and its location. The Developer is also responsible for immediately alerting IRCG of an emergency and for liaising and cooperating with the relevant Marine Rescue Centre to resolve the emergency.

The Developer is also obliged, under international maritime agreements and practices e.g. Safety of Life At Sea (SOLAS) convention, to provide assistance, where it is possible to do so, to other vessels or persons in danger at sea within or nearby the proposed development, and/or when requested to assist by IRCG.

The Developer may also need to provide its own vessel(s) and other assets to respond or react to other maritime emergencies e.g., pollution or a drifting vessel which presents an actual or possible threat to the safety of life or property at sea within or nearby the proposed development.

#### Principal Contractor

The Principal Contractor will be appointed by the Developer and has overall responsibility for:

- Updating and delivering the finalised MPCP on behalf of the Developer; and
- Ensuring all procedures in the MPCP are followed.

#### Contractors / Sub-contractors

Contractors and sub-contractors will be responsible for undertaking construction works in accordance with the MPCP.

#### Offshore ECoW

The ECoW will review contractor pollution response documents and arrangements to ensure compliance with this MPCP. The ECoW will provide advice to the Primary Responder as required in relation to potential environmental risk arising from oil or chemical spills.

#### Marine Pollution Incident

In case of an environmental incident or accident, all relevant authorities (including IRCG, the port authorities, Environmental Protection Agency (EPA)) will be informed. This is usually carried out automatically by IRCG. However, some of the mentioned bodies may request to receive a notification directly from the Project Manager.

The Marine Co-ordinator will be responsible for reporting pollution incidents to IRCG.

The following stages will be referred to in the case of an environmental incident or accident, as outlined in Figure 2 below.

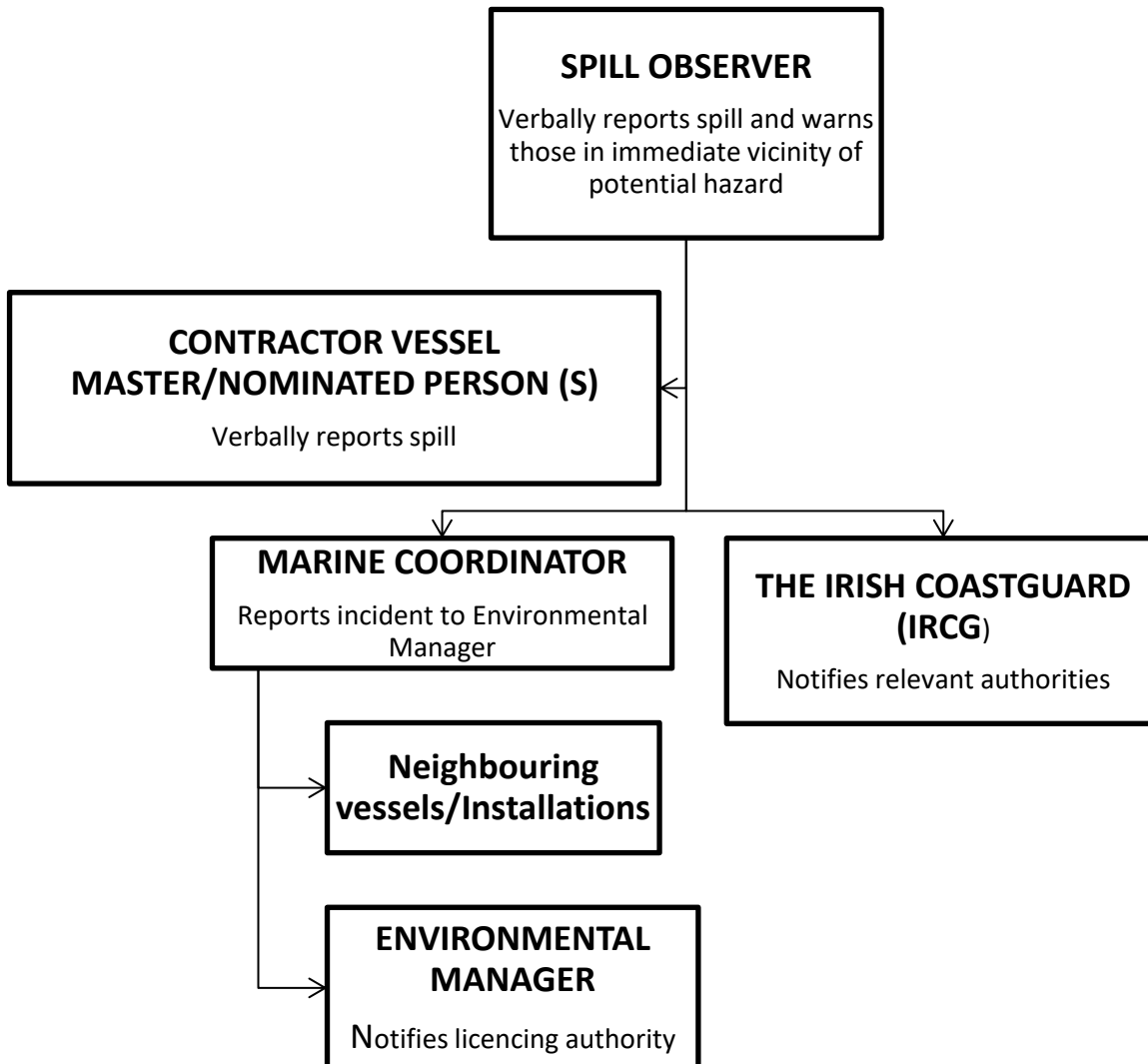


Figure 2 Marine Pollution Incident Reporting Stages

### Liaison Agreements between the Developer and IRCG

The Developer shall work to the principle that the first response to any incident shall be at the location of the incident, whether this is within or nearby the Proposed Development, or on a vessel. This applies equally to the construction, O&M and decommissioning phases.

Therefore, the Developer requires a certain standard and capability from the Contractors with whom it engages, with regards to wind farm work activities. These standards and competencies are, however, limited to what is practicable in respect of the vessels, structures and personnel.

In the event of an incident, the Developer will at no point position itself, unless requested by IRCG, between the IRCG and any party involved in an incident associated with the Proposed

Development. Therefore, all communications in respect of an incident will be directly between those involved and IRCG, unless IRCG advise otherwise. The Developer will however place its Marine Coordinator (MC) at the immediate disposal of the IRCG. This ensures effective communication of all information relevant to the incident.

The salient points of this procedure are that:

- All offshore incidents are, in the first instance, managed by the associated or responsible vessels;
- In the event of an incident, all vessels trigger their own Emergency Response Plan (ERP), which must ensure immediate contact is made to the IRCG, and, in parallel, contact is made to the Developer (via the Project Manager) and the main contract party involved in the activity;
- The main contract party and the Developer shall cooperate between themselves and as per the directions of the IRCG; and
- The Developer's team will take guidance from MGN 654 or any superseding guidance released by IRCG prior to consent in terms of requirements regarding shut-down (partial or complete) of the wind farm during Search and Rescue (SAR) operations, conducted within or passing through the wind farm.

In line with the Safety, Health and Welfare at Work (General Application) Regulations 2016, the Developer will also report any injuries or fatalities to the Health and Safety Authority.

### Spill Scenarios

The severity of effects from a spill are dependent on a wide range of factors, including:

- The volume of oil or chemical spilled;
- The physical and chemical nature of the product;
- The location of the spill and proximity of shoreline or other sensitivities;
- The weather and sea state conditions during and following the spill; and
- Hydrographic conditions.

Potential spill scenarios are dictated by the hydrocarbon and chemical inventories on the vessels and offshore installations. In practice, due to precautions such as training, operating procedures and engineered solutions, the majority of the spills that may occur are likely to be small.

For general oil spill response, it is common to divide levels of response into three tiers, according to the severity of the spill and the resources required to combat it. The three tiers are commonly defined as follows (Table 12.1):

Table 12.1: Oil spill response tiers

<b>Tier 3</b>
Spills that require national and/or international resources.
<b>Tier 2</b>
Spills that require local or regional resources as an enhancement to the on-site resources.
<b>Tier 1</b>
Operational type spills at or near the facility which can be handled by on site resources.

**Potential Spill Scenarios and Control Measures for The Proposed Development**

Table 12.2 below sets out the potential spill scenarios and control measures for the Proposed Development.

Table 12.2: Potential spill scenarios and control measures for the Proposed Development

Potential Pollutant	Spill Scenario	Control Measures	Likely Tier
Hydrocarbons Intermediate Fuel Oil (IFO) and Marine Gas Oil (MGO) (Diesel)	<b>Vessel refuelling</b> Loss of fuel during vessel to vessel refuelling at sea or refuelling at port.	The Developer and/or contractors will undertake operationally necessary refuelling at sea as required, to fuel vessels that are extremely restricted in their capability to leave station to take on fuel, such as jack ups. Preparation and review of task-specific risk assessments, method statements and fuel transfer planning tools and checklists.	Tier 2
	<b>Equipment refuelling</b> Loss of fuel during refuelling of equipment (on vessel or on turbine/offshore substation platform (OSP)).	Refuelling of vessels or equipment offshore shall, where practicable, only commence during daylight and in good weather conditions. Refuelling operations will be planned in advance. Fuel transfer operations will be carefully conducted under the supervision by an appointed responsible person on board (e.g. Chief Engineer) and in accordance with each vessel's stipulated procedure and checklist. A bunker plan shall be developed and posted on the Bridge and in the Machinery Control Room. Before fuel transfer starts a meeting will be held with all ship staff involved in the operation and the following subjects should be discussed, as a minimum: Bunker plan, including any anticipating changes; Risk assessment; Individual roles and responsibilities in the process; Emergency situations; and Bunkering Checklists. Only hoses fitted with non-return valves shall be used for the offshore transfer of fuel or other fluids. Vessels over 400 GRT will carry a SOPEP in compliance with The Merchant Shipping (Prevention of Oil Pollution) Regulations 1996.	Tier 1



Potential Pollutant	Spill Scenario	Control Measures	Likely Tier
		<p>Vessels over 400 GRT will carry an Oil Record Book in compliance with The Merchant Shipping (Prevention of Oil Pollution) Regulations 1996. In the Oil Record Book following particulars are entered:</p> <ul style="list-style-type: none"> <li>Details of fuel and oil bunker operations;</li> <li>Disposal of sludge (oil residues);</li> <li>Discharge overboard or disposal otherwise of machinery space bilge water;</li> <li>Condition of oil discharge monitoring and control systems;</li> <li>Accidental or other exceptional discharges of oil;</li> <li>Additional operational procedures and general remarks; and</li> <li>Appropriate training of personnel and supervision of activity.</li> </ul> <p>Compliance with conditions related to vessel refuelling are set out in Merchant Shipping Notice (MSN) 1829 "Ship to Ship Transfer Regulations 2010/2012".</p> <p>A visual lookout will be made at all times during fuel transfer operations to verify hose integrity throughout the transfer and in order to spot any leaks immediately.</p> <p>All storage tanks and/or areas shall be bunded to at least 110% of the total oil storage inventory volume.</p> <p>Personnel shall be trained in spill prevention awareness, and in the use of spill kits.</p> <p>Spill kits shall be readily available for mopping up any minor spills.</p> <p>Regular inspection and maintenance of equipment.</p> <p>The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc., special oil gutter ways etc. will be regularly inspected and drained or cleaned.</p> <p>Oil pressure pipes and fuel oil pipes and fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.</p>	

Potential Pollutant	Spill Scenario	Control Measures	Likely Tier
	<b>Vessel to vessel collision</b> Loss of fuel from collision between two vessels.	Embedded mitigation measures across all project phases of the proposed development such as: Advisory safe passing distances may be deployed around ongoing work being undertaken by a construction or maintenance vessel.	Tier 2 (possibly but unlikely Tier 3)
	<b>Vessel to structure allision</b> Loss of fuel from allision between vessel and structure (e.g., wind turbine).	Buoyed construction area around the array will be implemented during the appropriate phases in agreement with Irish Lights. Guard vessel (s), where appropriate, will be used to ensure adherence with advisory passing distances. Lighting and marking of the array in agreement with Irish Lights and in line with International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) G1162. Separate Lighting and Marking Plan (LMP) will be produced as per consultation discussions. Marine coordination will be implemented to manage project vessels. There will be appropriate marking of all offshore infrastructure associated with the proposed development on UKHO Admiralty charts. All project vessels will comply with international marine regulations as adopted by the Flag State including COLREGs and International Convention for the Safety of Life at Sea (SOLAS). Information relating to the proposed development will be circulated via Notices to Mariners and other appropriate media including via the Fisheries Liaison Officer (FLO). Consideration will be given to navigational safety and SAR with respect to WTG and layout design, including acceptable levels of SCADA systems.	Tier 2 (possibly but unlikely Tier 3)
	<b>Vessel stranding/grounding</b>	Embedded mitigation measures across all project phases of the Proposed Development such as:	Tier 2 (possibly but unlikely Tier 3)

Potential Pollutant	Spill Scenario	Control Measures	Likely Tier
	Loss of fuel due to vessel stranding/grounding.	<p>Marine coordination will be implemented to manage project vessels.</p> <p>All project vessels will comply with international marine regulations as adopted by the Flag State including COLREGs and International Convention for the Safety of Life at Sea (SOLAS).</p> <p>Information relating to the proposed development will be circulated via Notices to Mariners and other appropriate media including via the FLO.</p>	
	<p><b>Failure of plant or equipment</b></p> <p>Release of fuel due to failure of plant or equipment.</p>	<p>All equipment shall be operated and maintained in good order and in accordance with legal requirements.</p> <p>All plant and equipment shall only be operated by adequately trained and competent personnel.</p> <p>All storage tanks and/or areas shall be banded to at least 110% of the total oil storage inventory volume.</p> <p>The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc., special oil gutter ways etc. will be regularly inspected and drained or cleaned.</p> <p>Oil pressure pipes and fuel oil pipes and fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.</p>	Tier 1
	<p><b>Spillage during use of equipment</b></p> <p>Small spills during equipment operation.</p>	<p>Preparation and review of task-specific risk assessments and method statements.</p> <p>Personnel shall be trained in spill prevention awareness, and in the use of spill kits.</p> <p>Spill kits shall be readily available for mopping up any minor spills.</p> <p>The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc., special oil gutter ways etc., will be regularly inspected and drained or cleaned.</p>	Tier 1

Potential Pollutant	Spill Scenario	Control Measures	Likely Tier
		Oil pressure pipes and fuel oil pipes and fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.	
Lubricating Oil / Hydraulic Oil	<p><b>Incident</b> Loss of lubricating/hydraulic oil from collision between two vessels, or allision between vessel and structure, or stranding/grounding of vessel.</p>	<p>Embedded mitigation measures across all phases of the proposed development such as:</p> <p>Advisory safe passing distances may be deployed around ongoing work being undertaken by a construction or maintenance vessel.</p> <p>Buoyed construction area around the array will be implemented during the appropriate phases in agreement with Irish Lights.</p> <p>Guard vessel (s), where appropriate, will be used to ensure adherence with advisory passing distances.</p> <p>Lighting and marking of the array in agreement with Irish Lights and in line with International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) G1162. Separate Lighting and Marking Plan (LMP) will be produced as per consultation discussions.</p> <p>Marine coordination will be implemented to manage project vessels.</p> <p>There will be appropriate marking of all offshore infrastructure associated with the proposed development on UKHO Admiralty charts.</p> <p>All project vessels will comply with international marine regulations as adopted by the Flag State including COLREGs and International Convention for the Safety of Life at Sea (SOLAS).</p> <p>Information relating to the proposed development will be circulated via Notices to Mariners and other appropriate media including via the Fisheries Liaison Officer (FLO).</p> <p>Consideration will be given to navigational safety and SAR with respect to WTG and layout design, including acceptable levels of SCADA systems.</p>	Tier 2 or Tier 1

Potential Pollutant	Spill Scenario	Control Measures	Likely Tier
	<p><b>Leakage within WTGs</b> Leakage of lubricating gear oil, hydraulic oil or grease within nacelle.</p>	<p>All equipment shall be operated and maintained in good order and in accordance with legal requirements.</p> <p>The inventory of lubricating gear oil is limited within the turbine nacelle as there is no conventional gear box (direct drive).</p> <p>Turbine sensors will enable early detection of loss of fluid and leaks.</p> <p>There is a banded area within the nacelle to collect lubricating oil in the unlikely event of a leak.</p> <p>Gear oil seals shall be routinely checked during planned maintenance programmes.</p>	Tier 1
	<p><b>Leakage within OSPs</b> Leakage of transformers.</p>	<p>All equipment shall be operated and maintained in good order and in accordance with legal requirements.</p> <p>Transformer oil seals shall be routinely checked during planned maintenance programmes.</p>	Tier 1
	<p><b>Spillage during use of equipment</b> Small spills during equipment operation.</p>	<p>Preparation and review of task-specific risk assessments and method statements.</p> <p>Personnel shall be trained in spill prevention awareness, and in the use of spill kits.</p> <p>Spill kits shall be readily available for mopping up any minor spills.</p> <p>Fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.</p>	Tier 1
	<p><b>Failure of plant or equipment</b> Release of lubricating oil due to failure of plant or equipment.</p>	<p>All equipment shall be operated and maintained in good order and in accordance with legal requirements.</p> <p>All plant and equipment shall only be operated by adequately trained and competent personnel.</p>	Tier 1

Potential Pollutant	Spill Scenario	Control Measures	Likely Tier
Chemicals	<p><b>Incident</b> Loss of chemical load from vessel collision/allision, or stranding/grounding of vessel.</p>	<p>Chemicals will, where relevant, be selected, stored and managed in accordance with the Offshore Chemical Regulations 2002 (as amended). Embedded mitigation measures across all project phases of the Proposed Development such as:</p> <ul style="list-style-type: none"> <li>▪ Advisory safe passing distances may be deployed around ongoing work being undertaken by a construction or maintenance vessel.</li> <li>▪ Buoyed construction area around the array will be implemented during the appropriate phases in agreement with Irish Lights.</li> <li>▪ Guard vessel (s), where appropriate, will be used to ensure adherence with advisory passing distances.</li> <li>▪ Lighting and marking of the array in agreement with Irish Lights and in line with International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) G1162. Separate Lighting and Marking Plan (LMP) will be produced as per consultation discussions.</li> <li>▪ Marine coordination will be implemented to manage project vessels.</li> <li>▪ There will be appropriate marking of all offshore infrastructure associated with the proposed development on UKHO Admiralty charts.</li> <li>▪ All project vessels will comply with international marine regulations as adopted by the Flag State including COLREGs and International Convention for the Safety of Life at Sea (SOLAS).</li> </ul>	Tier 1

Potential Pollutant	Spill Scenario	Control Measures	Likely Tier
	<p><b>Leakage within WTG</b> Leakage of coolant or transformer fluid within nacelle.</p>	<p>All equipment shall be operated and maintained in good order and in accordance with legal requirements. Turbine sensors will enable early detection of loss of fluid and leaks. There is a bunded area within the nacelle to collect lubricating oil in the unlikely event of a leak. Equipment including hoses, pipes and seals shall be routinely checked during planned maintenance programmes. Chemicals will, where relevant, be selected, stored and managed in accordance with the Offshore Chemical Regulations 2002 (as amended).</p>	Tier 1
	<p><b>Spillage during use</b> Spillage of paints, paint thinners, solvents, cleaning fluids etc during use.</p>	<p>Reparation and review of task-specific risk assessments and method statements. Personnel shall be trained in the correct handling and use of chemicals. Personnel shall be trained in spill prevention awareness, and in the use of spill kits. Spill kits shall be readily available for mopping up any minor spills. All hazardous substances shall have a safety data sheet (SDS) which is intended to provide procedures for handling or working with that substance in a safe manner. The handling and use of chemicals and hazardous substances shall be in compliance with the information on the SDS. COSHH assessments should be conducted for Development specific hazardous substances. Segregated storage facilities will be used to control the separation of hazardous substances. Chemicals will, where relevant, be selected, stored and managed in accordance with the Offshore Chemical Regulations 2002 (as amended).</p>	Tier 1



## Training

Training will be given to all relevant Project staff on their responsibilities for preventing pollution and procedures to follow in the event of an emergency incident including who should be notified.

The conventional view of a Tier 3 scenario is one involving an exceptionally large volume of spilled oil, for example from a major ship-sourced accident, or other such rare but highly significant event. However, a Tier 3 response may also be required for more modest volumes, perhaps where Tier 2 arrangements may be largely absent or overwhelmed, highly sensitive areas threatened, or highly specialised strategies being required that are not available locally.

Full major emergency response drills will be conducted every quarter, to ensure that all personnel, including the Marine Coordinator, can demonstrate understanding and compliance with the MPCP's requirements.

## Monitoring

### Mitigation Measures

To ensure all mitigation measures put in place are maintained and continue to be effective, monitoring will be carried out to ensure compliance of the works with the measures detailed in this MPCP.

### Equipment

Regular checks of equipment will be undertaken by the Contractor to identify any oil or fuel leaks and to confirm the condition of the equipment. Records will be kept of all inspection findings for review. Regular checks for visual evidence of contamination, leaks or spillages will also be made nearby working areas and in areas of water discharge.

All machinery will be maintained in a good condition and any maintenance required is to be undertaken in controlled areas.

### Recording

Records will be kept for all initial, final and routine monitoring inspections of all mechanical plant and working construction areas, as well as ecological and environmental issues. These records will be stored in an agreed location on site and be available for internal and external monitoring as required.

Record sheets will detail the date, location of inspection, frequency, findings, appropriate person/s notified and identified actions as necessary. Records of any spills detailing the location, date/time, volume, material spilt, clean-up operation, investigation/report/lessons learnt will also be kept.

## APPENDIX 2 – Emergency Incident Response Procedure

### Introduction

All incidents associated with activities throughout construction and operation and maintenance phases of the proposed development, including environmental incidents and non-conformance with the measures set out in this EMP, will be reported and investigated using the procedures that will be set out below.

### Roles and Responsibilities

#### Developer

In the event of an emergency associated with the Proposed Development, or at sea involving its personnel and/or vessels, the Developer is responsible for providing immediate rescue and first aid medical response, to a level appropriate for the circumstances of the Proposed Development and its location. The Developer is also responsible for immediately alerting IIRCG of an emergency and for liaising and cooperating with the relevant Marine Rescue Centre to resolve the emergency.

The Developer is also obliged, under international maritime agreements and practices e.g. Safety Of Life At Sea (SOLAS) convention, to provide assistance, where it is possible to do so, to other vessels or persons in danger at sea within or nearby the Proposed Development, and/or when requested to assist by IIRCG.

The Developer may also need to provide its own vessel(s) and other assets to respond or react to other maritime emergencies e.g., pollution or a drifting vessel which presents an actual or possible threat to the safety of life or property at sea within or nearby the Proposed Development.

Table 12.3: Contact details of responsible parties (not exhaustive)

Position	Name	Telephone	Email
Marine Coordinator	Contact details will be added to the finalised procedure iteration.		
Project Manager			
Project Director			
Lead Commissioning Manager			
Project Safety, Health and Wellbeing Manager			
Environmental Manager			
24hr Emergency Contact			

Position	Name	Telephone	Email

## APPENDIX 3 – Invasive Non-Native Species Management Procedure

### Introduction

Introduction of Invasive Non-Native Species (INNS) can alter community composition through changes in predation or competition for resource, which can lead to a change in habitat, or loss of native species. The introduction of such invasive species can be via vessel or through contaminated (i.e. colonised by invasive species) equipment.

This INNS management procedure (INNSMP) details how marine works (including construction, operation and maintenance and decommissioning of subsea structures) and vessel operations will follow best guidance, preventing and reducing the risk of possible spread or introduction of Invasive Non-Native Species (INNS) into the waters of the proposed development. The method employed in this INNSMP follows the GB Invasive Non-Native Species Strategy (2023 to 2030) (GB INNS, 2023), although consideration has also been given to guidelines from Invasive Species Ireland (ISI, 2021), noting that these are for the aquaculture industry. The INNS Strategy (2023 to 2030) involves a three-tier approach:

- Prevention: Prevent all INNS from entering the waterbody in question;
- Rapid response: Detection of INNS as early as possible, monitor and possible eradication of INNS present; and
- Control and containment: Should proliferation of INNS be too great for eradication, control and containment of populations will be required.

The Developer approaches the management for INNS with a focus on “Prevention”, in line with the INNS Framework Strategy, with a view to avoiding ‘rapid response’ and ‘control and containment’ methods.

The INNSMP will be updated prior to construction and will remain a ‘live’ procedure throughout the lifetime of the project, with periodic updates during the phases of the Proposed Development.

### Roles and Responsibilities

#### The Developer

Requiring the implementation of the INNS management procedures and monitoring and/or clearance/disposal of INNS at the Proposed Development (via its Contractors and Subcontractors).

#### Environmental Clerk of Works (ECoW)

Quality assurance of the INNS management procedures. Monitoring Contractor/Subcontractor compliance with these procedures during all phases of the Proposed Development, reporting any incidents with INNS.

### Environmental Manager

Delegated responsibility for the practical implementation of the INNS management procedures.

### Contractor and Subcontractor

Implementation of and adherence to INNSMP and early notification of the presence of INNS to or via Biosecurity Manager.

### Non-Native Species Management Methodology

In order to make an accurate risk assessment of the Proposed Development and derive a suitable INNSMP, a stepwise approach was taken as discussed in detail below.

#### Step 1: Understanding the site

The characteristics of the proposed development site should be provided to include the following:

- Salinity of the site;
- The presence of any man-made structures; and
- Whether INNS are present within/on site.

#### Step 2: Understand how INNS may be introduced or spread to the site

In addition to understanding the site characteristics, any structures present and the existing presence of INNS, consideration of pathways by which INNS may be introduced or spread are needed. The step should be iterative and revisited when the INNSMP is due for review. The questions and associated risk included in Table 12.4 have been adapted from Cook et al. (2014) and provide the type of questions to consider when creating an INNSMP.

Table 12.4: Example of questions and risk to consider whilst creating an INNSMP (Cook et al., 2015)

Question	Yes = High	Yes = Medium	Yes = Low
1. Is the vessel over 400 gross tonnes (gt), with a BWM Convention compliant Ballast Water Management Plan, System and certificate?			
2. Is the vessel over 400 gross tonnes (gt), with an AFS Convention (2001) compliant Anti Fouling System and certificate?			
3. Has the vessel/ equipment just arrived from the local area?			

4. Has the vessel/ equipment had an anti-fouling coating applied to submerged structures within the last 12 months (or time recommended by manufacturer)?			
5. Are all the visible submerged surfaces of vessels or equipment to be deployed free of bio-fouling (a green 'slime' is OK)?			
6. Do the visible submerged surfaces of vessels or equipment to be deployed have more than a green 'slime' coating?			
7. Does the vessel or equipment to be deployed have noticeable clumps of algae and/ or animals clinging to the visible parts?			
8. Has the vessel/ equipment just arrived from another country or region with similar environmental conditions (e.g., seawater temperature)?			
9. Has the vessel/ equipment just arrived from a water body known to have INNS present?			
10. Does the vessel/ equipment spend long periods of time stationary at sites in between anti-fouling treatments?			
11. Is the vessel 'slow moving', such as a construction barge or drilling rig?			

### Step 3: Understand the site activities which risk the introduction of INNS

The next step is to identify the main activities which take place at the site or as part of the operation/event, particularly those that could lead to the introduction and/or release of marine INNS at the site. Often this step involves a simple approach of listing all activities, using information obtained through the first two steps.

Many activities will pose negligible or no risk of introducing and/or releasing marine INNS, for example activities undertaken in areas remote from the marine environment and as such, are not required to be included in this procedure. However, caution is advised when considering any activity carried out adjacent to the water and which may include both vessels and structures.

Cook *et al.* (2014) provide a list of potential activities representing risk of introduction and/or releasing INNS. Of these those which are relevant to offshore renewables, but applicable ones include:

- use of construction barge and slow moving vessels;
- using vessels from locations outside local water body;
- removal of old structures/equipment;
- cleaning of hull and associated structures; and

- maintenance of equipment and vessels.

#### Step 4: Biosecurity Control Measures

Once the project's activities are understood, identify the prevention measures undertaken to minimise the risk of introducing and/or spreading INNS. Initially this step involves a simple approach of listing all activities, using information obtained through the first two steps which will inform the identification and development of control measures which should be effective, simple, realistic and easily translatable into instructions to others.

To ensure that control measures are appropriate a number of issues should be considered:

- who will be responsible for undertaking the action;
- what actions will be employed to minimise the risk of introducing and/or releasing INNS;
- where will control measure be applied; and
- when will control measure be applied.

#### Step 5: Biosecurity Surveillance, Monitoring and Reporting Procedures

The early detection of INNS on a site is essential to facilitate their containment and potential eradication. Consequently, all staff and other site users should be encouraged to report any unusual sighting to the Environmental Manager.

This step outlines those procedures to be followed in the event of discovering and positively identifying an INNS on site. As part of this process the following should be considered:

- identifying who is responsible for surveillance and monitoring of the site; and
- adding actions to encourage vessel owners who use the site to be vigilant and report any sightings of concern.

#### Step 6: Contingency Plan

In the event that 'prevention' and 'rapid response' methods, as outlined above in this section, fail, a contingency plan will be created by the Contractor's Environmental Manager and will be delivered to all relevant personnel by appropriately qualified personnel, e.g., ECoW(s). This document should be short, provide a step-by-step approach and be accessible to all staff. This plan will review the identified activities listed in the INNSMP and derive actions based on the failure of the biosecurity control measures attributed to the listed activities.

#### Evaluation and Review

Following completion of the INNSMP, a clear recording system and review date will be put in place to accurately record the results of any checks or actions taken. Similarly, formal steps should be



put in place to ensure that the Environmental Manager is informed of the potential introduction and/or release of INNS.

A programme for the review of site and operation plans should be drawn up to refine and update the INNSMP as required.

### **Mitigation**

Any vessels used for the delivery of materials to site will adhere to industry legislation, codes of conduct and/or best practice to reduce the risk of introduction or spread of INNS.

## APPENDIX 4 – Dropped Objects Procedure

In the course of operations objects may be dropped in the marine environment. Materials dropped at sea can constitute a significant hazard to other sea users and the marine environment. Licensees must report dropped object incidents to the nearest local coastguard station by telephone at the first opportunity. In instances where the dropped object poses a hazard to other mariners, licensees should also ensure that a Notice to Mariners is issued to alert relevant parties.

In the first instance, when an object has been dropped into the marine environment, the vessel master, and the Developer (Client) vessel representative should be immediately informed, and the event recorded in the vessel log. The Contractor shall immediately identify the location of the dropped object and deploy buoys and lights etc. in order to ensure the safety of shipping and, when appropriate, immediately take steps to salvage the dropped object.

It is the responsibility of the licensee to ensure that any contractor, or person involved in construction/maintenance work on their behalf, is made aware of, and adheres to, the dropped objects procedure that has been put in place. This procedure will include the following mitigation measures as a minimum:

- Good housekeeping practices, with all wastes correctly stored;
- Storage of hazardous chemicals as per material safety data sheet (MSDS);
- Lift planning for over-the-side lifting (including appropriate crane rigging and load ratings, crane operator and rigger training and competency requirements) all lifting equipment will be tested and certified;
- A ship-to-ship transfer permit will be in place;
- All deck items will be securely stowed;
- Transfers of objects will use specialist equipment and consider environmental conditions;
- Ongoing personnel awareness and training, and dropped object prevention programs (e.g., lanyards on hardhats, hand tools);
- Safe working procedures to prevent dropped objects;
- Procedures will be put in place to ensure that the location of any lost material is recorded and that significant objects are recovered – including ROV and boat recovery where practicable; and
- Ongoing personnel awareness and training, and dropped object prevention programs.

The Contractor must make all reasonable attempts at retrieval including surveying the seabed, if required, as part of the investigations into the retrieval of the Dropped Object.

A report shall then be submitted to the Developer detailing the investigation process and concluding with the details of the retrieved Dropped Object. However, in the event a Dropped Object cannot or has not been retrieved, the report will need to demonstrate the investigation process in attempting to retrieve the Dropped Object, why the Dropped Object cannot or has not been retrieved and include an assessment of the risk (including hazards to navigation, fishing equipment, marine flora and fauna and water quality) of the Dropped Object remaining in situ. An assessment of risk should also take the following into account to justify the Dropped Object remaining in situ:

- The legislative or regulatory requirement to recover the Dropped Object;
- The likelihood of successfully retrieving the Dropped Object;
- The risk and potential harm the Dropped Object poses to the environment, flora and fauna and other sea users;
- The risks associated with recovery; and
- The timing of recovery operations.

## APPENDIX 5 – Offshore Waste Management Procedure

### Introduction

The following aspects of the proposed development are particularly relevant to the resource and waste assessment:

- Design: throughout the design for the proposed development, consideration has been given to the minimisation of resource usage and the generation of waste through retention of material on site and material reuse;
- Construction phase: waste will be generated from offshore seabed preparation works, offshore installation works,. General construction waste and municipal waste will also be generated during the construction phase. During the construction of the proposed development, material usage will be minimised, and material will be reused, where possible;
- Operational phase: waste will be generated from maintenance activities related to the operation of the proposed development; and
- Decommissioning phase: waste will be generated from the decommissioning of both the offshore and onshore infrastructure related to the proposed development.

The detailed final Waste Management Procedure will remain a live procedure and will be used to describe the progress on site against waste management forecasts also to be developed alongside this procedure. This will also allow for any changes either to the works or to accommodate new legislative requirements.

### The Waste Hierarchy

The proposed development and its contractors will employ the principles of the waste hierarchy and set out in Directive 2008/98/EC on waste and repealing certain Directives and Directive 2018/851 of the European Parliament and as implemented by the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011), as amended.

The waste hierarchy supports the need to achieve efficient use of material resources, minimise the amount of waste produced (or otherwise increase its value as a resource) and reduce, as far as possible, the amount of waste that is disposed of in landfill. Key stages of the waste hierarchy are outlined below.

### Prevention

The majority of opportunities to minimise the amount of waste occur during the design stage:

- Designing out waste – ensuring that waste reduction is planned in from project inception to completion;
- Designing for longevity;
- Designing for adaptability or flexibility;
- Designing for disassembly; and
- Using systems, elements of materials that can be reused or recycled.

Designing out waste opportunities will be investigated by the proposed development; these opportunities will be identified during detailed design and will be set out in the finalised Waste Management Procedure.

The overall objective for managing surplus materials will be to maximise material reuse, reduce vessel movements as far as possible in handling such materials, and reduce the amount of material that must be taken for management onshore.

### Re-Use

Non-hazardous excavated spoil will be reused on site where possible. The consideration of resources in the context of this assessment includes a review of the potential for beneficial reuse of materials arising from the construction of the proposed development (e.g., excavated soil and stones). If excavated material is not required for the construction of the proposed development, the appointed contractor will screen the material for suitable end uses including other construction projects beyond the proposed development, with priority to be given to activities which are higher up the waste hierarchy. The material would then be considered as a resource for reuse beyond the proposed development insofar as is reasonably practicable and may be notified to the EPA as a by-product, as appropriate.

### Recycle

The Contractor will consider the use of recycled materials where possible, subject to cost and availability.

### Disposal

All waste that cannot be reused, recycled or recovered will be kept onboard the vessel and safely disposed of onshore in a suitable licensed waste facility.

### Waste Categories

At a strategic level, the key waste types generated from the construction of the Proposed Development can be classified as follows:

- Inert – wastes that will not cause adverse effects to the environment when disposed of, or do not decompose and they have no potentially hazardous content when deposited in a landfill.
- Non-hazardous – wastes that will decompose when buried resulting in the production of methane and carbon dioxide.
- Hazardous – wastes that are harmful to human health or the environment (for example, causing pollution of watercourses) if they are incorrectly handled, stored, treated or disposed of. Hazardous wastes may have one or more of the following properties: explosive, corrosive, flammable, highly flammable, infectious, oxidising or sensitising.

### Vessels

All vessels will operate under international standards according to the MARPOL (maritime pollution) Convention with respect to wastewater and food waste discharges.

### Storage of Waste

Any waste generated during offshore construction works will be segregated and stored in designated containers and returned to port by the appointed contractor to be collected and delivered to an authorised waste facility.

Waste arising from the works associated with the offshore elements of the proposed development will be segregated based on its classification as non-hazardous or (potentially) hazardous on board the vessels.

## APPENDIX 6 – Protocol for Archaeological Discoveries (PAD)

### Introduction

The PAD is a system for reporting and investigating unexpected archaeological discoveries encountered during the different phases of the proposed development, with a Retained Archaeologist providing guidance and advising industry staff on the implementation of the PAD. The PAD also makes provision for the implementation of temporary exclusion zones around areas of possible archaeological interest, for prompt archaeological advice, and, if necessary, for archaeological inspection of important features prior to further activities in the vicinity.

The protocol can be implemented in conjunction with many types of proposed works and is designed to operate when it is not practical or safe for an archaeologist to be present. Works that may require an archaeological protocol include geotechnical surveys, UXO surveys, pre-lay grapnel runs, clearance works, construction, operation, decommissioning, or any other works with the potential for the discovery of material on the seabed and/or recovery of material to the surface. Method Statements relating to these activities should include provision for reporting discoveries through a protocol.

### Protocols

#### Reporting

Any discoveries by Project Staff are reported to the Offshore ECoW, Vessel Master, a Construction Foreman, or any other person in a position to control the immediate works. The ECoW will in turn inform the Retained Archaeologist and the Developer's 's Project Manager(s).

The Retained Archaeologist will in turn liaise with, the Developer and/ or their representative, the Archaeological Curator(s) and others, as necessary. Provision will be made by the Developer and/ or their representative, in accordance with the PAD, for the prompt reporting/ recording to the Archaeological Curator(s) of archaeological remains encountered or suspected during the works. If the find is recovered and constitutes 'wreck' within the terms of the Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023, then the Retained Archaeologist will compile a Report of Wreck and Salvage to be signed by the Client and sent to the Receiver of Wreck within 28 days of recovery. Should a find comprise material suspected to be from an aircraft lost while in military service, both the Receiver of Wreck and the Department of Defence will be notified by the Client as advised by the Retained Archaeologist, as the material will still be considered 'wreck' under the Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023. . With regards recovery of 'wreck', the Client and/or their representative will be responsible for the legal obligations under the Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 and all correspondence with the Receiver of Wreck. If recovered material is held by the Retained Archaeologist, it is essential they are included in all correspondence with the Receiver of



Wreck and are aware of any updates or changes to the reports (commonly known as droits) associated with the material.

For discoveries of high archaeological importance, call-out investigations could be instituted, following discussions with the Archaeological Curator(s).

### Training and Awareness

As the Protocol for Archaeological Discoveries (PAD) is designed to operate when an archaeologist is not present, it is recognised that for the Protocol to be effective, relevant participants (should receive Protocol Awareness training from the Retained Archaeologist or appropriate alternative. Project Staff involved with the following works in particular should undergo training: UXO survey(s), pre-lay grapnel runs, clearance works, and any other works with potential for the discovery of material on the seabed and/ or recovery of material to the surface. This will ensure that staff are familiar with the PAD, are able to recognise finds of archaeological potential, understand how to record them, and are aware of the reporting process.

Protocol Awareness talks can be undertaken by the Retained Archaeologist for all relevant staff, through short 'Toolbox Talks', and hard copies of the Protocol can be made available for use on board vessels. The relevant staff on applicable pre-construction, construction, operation and decommissioning vessels will be informed of the Protocol, details of the find types that may be of archaeological interest, and the potential importance of any archaeological material encountered.

## APPENDIX 8 – Offshore Decommissioning Strategy

### Overall Approach

It is anticipated that any offshore decommissioning process will involve similar activities to the construction process but that these will be undertaken in reverse, with removal of above surface structures initially (blades, nacelle, turbine, towers, and transition piece) followed by removal of foundations and associated subsurface infrastructure. It may be decided that the removal of foundations, pilings, scour protection and inter-array / offshore export cabling may cause greater environmental impacts than leaving in-situ and that if safe to do so, then certain infrastructure may be cut at or just below the seabed with cabling left buried.

The exact approach to decommissioning will meet any statutory requirements or guidance set out in relevant legislation at the time of decommissioning. The approach to decommissioning would be documented in a Decommissioning Plan and Programme which will be subject to consultation with the Maritime Area Regulatory Authority (MARA) / relevant stakeholders as required. There will be a rehabilitation schedule which will be part of the proposed development Maritime Area Consent (MAC) and will be available publicly. The rehabilitation schedule will include the proposed rehabilitation programme, timelines, and estimated costs.

### Offshore infrastructure to be decommissioned

#### WTGs and OSP

WTGs will be removed by reversing the methods used to install them. Decommissioning vessels will be used to remove the rotor blades, nacelle and the tower sections and then transport all the components to a dedicated facility for processing and reuse/recycling/disposal.

#### Cables

It is envisaged that, where appropriate, buried assets such as cables will be left in situ when the proposed development is decommissioned. Discussions with stakeholders and regulators may identify the need for cables to be wholly or partially removed.

Should cables be removed, this would require the removal of seabed material or cable protection measures to allow access. Using a grapnel, the cables will be raised from the seabed, cable sections cut and recovered to an onshore facility for processing, reuse, recycling and/or disposal. The remaining ends would be weighted and returned to the seabed. The rock protection or concrete mattresses over the cables will only be displaced as much as necessary to remove the cables. The removed cables themselves will be taken to a suitable recycling facility where possible.

At the HDD exit pit, to minimise the environmental disturbance during decommissioning, the offshore export cables will be left in place in the seabed with the cable ends cut, sealed, and securely buried as a precautionary measure. Partial removal of the cable may be achieved by

pulling the cables back out of the ducts. This may be preferred to recover and recycle the copper and/or aluminium and steel within them.

### Vessels

Decommissioning is currently based on reverse installation and the assumptions about number of vessels and their movements is therefore the same as described for construction of the wind farm in Section 8.4 of the Offshore Construction Chapter.

### Environmental Control Measures

All environmental control measures are contained within the Offshore Environmental Management Plan (EMP) and those that are specific to decommissioning are included.

Prior to decommissioning a study of the potential environmental impacts to marine mammal receptors from the proposed decommissioning activities would be undertaken, considering the baseline environment at the pre-decommissioning stage. All mitigation measures to be delivered would be captured within the Rehabilitation Schedule and Offshore EMP. Any licences or authorisations that might be required would be identified and obtained prior to decommissioning, including any validation, updating or new submission of an EIAR, as required.

The rehabilitation schedule will refer to the measures that are pertinent to the control and management of impacts for the following topic/receptors:

- Seabed, wildlife and natural habitats;
- Water quality; and
- Landscape and seascape.

### Consultation

- Consultation will be undertaken in the years preceding decommissioning on both the decommissioning strategy and any environmental assessment undertaken, in order to minimise the impact on the environment and stakeholders.

### Costs and Financial Security

The Developer, as the Holder of the MAC, will comply with the requirements for a Rehabilitation Bond as set out in section 21 of the MAC. Since this information will be submitted not later than 60 days prior to the commencement of any works under the Development Permission (MAC section 21.2), the information provided at that stage will be based on the available information at the time and will be updated through the approval of the Decommissioning Plan.

### Rehabilitation Schedule

Appendix 6.2: Rehabilitation Schedule provides an outline approach to rehabilitation for each of the relevant topics or receptors which would meet the requirements set out in Section 95 of the MAP Act. The exact requirements will be agreed through detailed consultation and assessment with the relevant authorities at the time.