Spiorad na Mara Offshore Wind Farm

Offshore Project

Environmental Impact Assessment Report

Non-Technical Summary, Volume 1a

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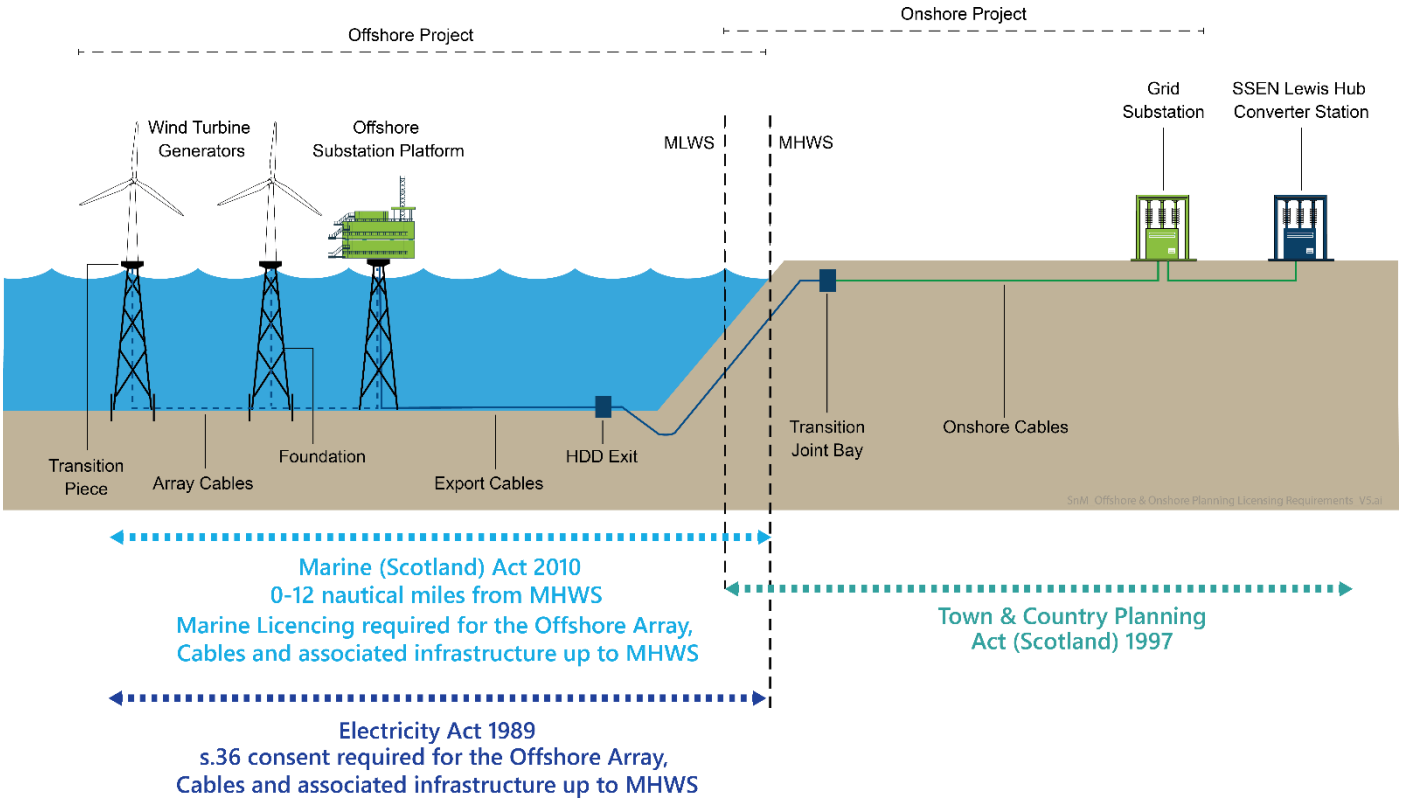
1 INTRODUCTION

1.1 OVERVIEW

1.1.1.1 This Non-Technical Summary (NTS) presents an overview of the component infrastructure of the 'Offshore Project', which is defined as the elements of Spiorad na Mara offshore wind farm which are seaward of Mean High Water Springs (MHWS) (**Plate 1-1**). This NTS provides a summary of project design information and environmental assessment undertaken for the Offshore Project, as set out in the more technical and detailed Environmental Impact Assessment Report (EIAR).

Plate 1-1 Project Overview (some elements of which form optional parts of the project design envelope, such as the Offshore Substation Platform.)



1.1.1.2 This NTS describes, in non-technical language, the Offshore Project and how it has been assessed. This is to provide a clear understanding to anyone interested in the Offshore Project and how it may affect the environment and communities.

1.1.1.3 The Offshore Project is located off the northwest coast of the Isle of Lewis / *Eilean Leòdhais* in the Western Isles / *Na h-Eileanan Siar*, Scotland / *Alba* (see **Plate 1-2**). In 2022, Spiorad na Mara Limited (the 'Applicant') was successfully awarded a lease agreement for the N4 Plan Option in the first ScotWind leasing round.

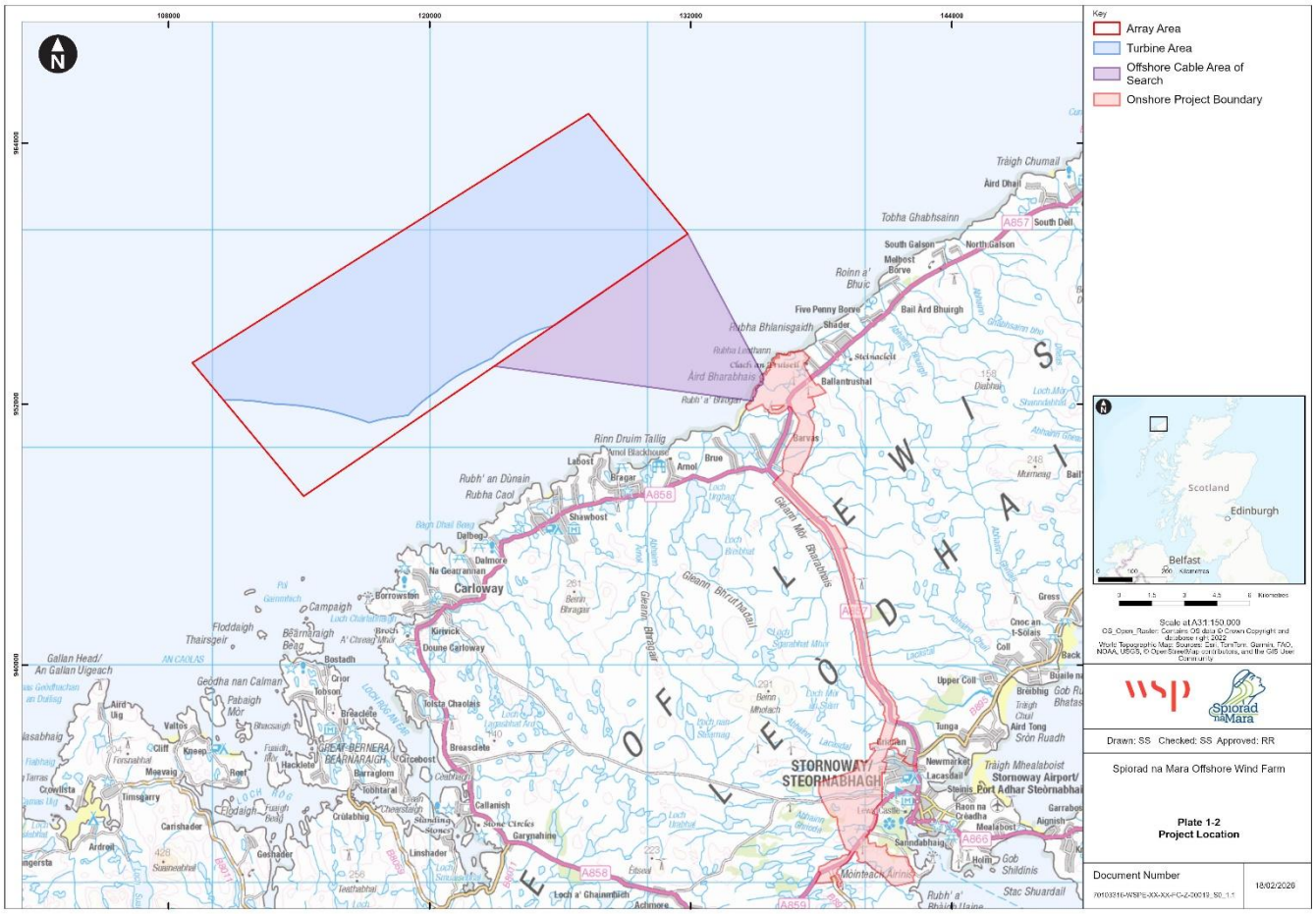
1.1.1.4 The Project consists of both offshore and onshore elements and will generate and transmit renewable electricity to the National Grid. The Applicant has a connection agreement with Scottish and Southern Electricity Networks (SSEN) for a connection to the grid network via SSEN's Alternating Current (AC) Substation and High-Voltage Direct Current (HVDC) Converter Station (referred to as the SSEN Lewis Hub).[1]

1.1.1.5 Due to ongoing design refinement of the onshore elements, the Applicant is submitting separate consent applications for the offshore and onshore elements of the Project. The Offshore Project, which is the focus of this Environmental Impact Assessment Report (EIAR), is defined as the infrastructure and works located seaward of Mean High Water Springs (MHWS). The Onshore Transmission Works (OTW) Project is defined as the infrastructure and works landward of Mean Low Water Springs (MLWS), for which a further consent application will be sought.

1.1.1.6 To ensure the Project is considered holistically, the EIAR considers where elements of the OTW Project have the potential to interact with the Offshore Project, to generate an effect at a common receptor.

[1] The SSEN Lewis Hub is not part of the Project and is to be developed as part of the upgraded Western Isles HVDC Link.

Plate 1-2 Project Location Purpose of this Non-Technical Summary



1.2 PURPOSE OF THIS NON-TECHNICAL SUMMARY

1.2.1.1 The aim of this NTS is to act as a stand-alone document, to provide an overview of the environmental information relating to the proposed Offshore Project. The Offshore EIAR (**Volumes 1 – 3**) provides full consideration and assessment of the Offshore Project and should be referred to for further information.

1.2.1.2 The focus of the EIAR is to enable the local community and other stakeholders, and the Scottish Ministers as the decision-maker, to understand the likely significant environmental effects of the Offshore Project.

1.2.1.3 This NTS includes a description of the Offshore Project, a summary of the consultation process and the Environmental Impact Assessment (EIA) work undertaken. **Table 1.1** provides a summary of each of the sections within the NTS, to assist in navigating the information presented.

Table 1.1 What's included in this Non-Technical Summary

Section	What is it about?
1. Introduction	The remainder of this Introduction section introduces what the Offshore Project is, where it is located and why it is needed. An introduction is also given to the Applicant.
2. Project Description	This section explains how the Offshore Project will be built and how long construction will take.
3. Site selection and alternatives	This section provides a summary history of the design evolution of the Offshore Project and what alternatives have been considered.
4. Approach to Environmental impact assessment	This section explains how the assessment has been undertaken and how it has been informed by consultation and stakeholder engagement.
5. Environmental assessment	This section provides a summary of the approach to environmental assessment and the possible environmental effects experienced as a result of the Offshore Project. For each of the offshore environmental topics, the section provides an overview of how the environmental effects have been assessed, a description of the existing environment, overview of environmental measures to avoid, prevent, reduce or, if possible, offset any identified likely significant environmental effects as a result of the Offshore Project.
6. Glossary of terms and abbreviations	This section explains the meaning of the technical terms that are used in this NTS. It also expands and defines any abbreviations that are used.

1.3 THE APPLICANT

1.3.1.1 Spiorad na Mara Limited is the company that owns the Project. Northland Power Inc. (Northland) is the indirect owner of 75.5% of the share capital and Electricity Supply Board (ESB) indirectly owns the remaining 24.5%. The Joint Venture (JV) between Northland and ESB is formalised by way of a Shareholder Agreement.

1.3.1.2 Northland is committed to advancing clean energy solutions and has established a strong presence in both North America and international markets, particularly in Europe and Asia. ESB is a leading Irish energy company committed to sustainability and reducing carbon emissions, with a strategic focus on decarbonising its operations and increasing its renewable energy capacity with an expanding presence across Great Britain.

1.4 SPIORAD NA MARA OFFSHORE WIND FARM

1.4.1.1 The name for the wind farm, Spiorad na Mara, meaning Spirit of the Sea in Scottish Gaelic was developed through engagement with local community stakeholders and was inspired by Hebridean folklore as well as reflecting the local area, its heritage, culture and history.

1.4.1.2 The Offshore Project (See **Plate 1-2**) is situated off the northwest coast of the Isle of Lewis/*Eilean Leòdhais* and the Array Area is located approximately 5-13 km offshore and is approximately 161 km^2 in size. It will comprise up to 60 Wind Turbine Generators and associated foundations, Offshore Cables, an Offshore Substation Platform (if required), and Landfall elements seaward of Mean High Water Springs. These technical terms are described in the glossary in Section 6. The Offshore Project Boundary is defined as the combination of the Array Area and the Offshore Cable Area of Search. The water depths across the Array Area generally range from 37 m-67 m, except for a localised area in the southwest corner of the Array Area which reaches 72 m. The proposed Wind Turbine Generators and fixed foundations will be located within a Turbine Area of approximately 140 km^2, within the Array Area.

1.4.1.3 The construction of the Offshore Project is anticipated to take approximately 5 years, with construction beginning in 2028/2029 and the Offshore Project being fully operational in 2032/2033.

1.5 THE ROLE OF RENEWABLE SOURCES OF ENERGY

1.5.1 CLIMATE CHANGE

1.5.1.1 The Paris Agreement, signed in 2015 at the Conference of the Parties (COP21) by 196 countries aims to limit global warming well below 2°C, with efforts to keep it to 1.5°C (United Nations, 2015). In accordance with the Paris Agreement, on 12 December 2020, the UK conveyed its Nationally Determined Contribution. The UK committed to reducing GHG emissions by at least 68% by 2030: compared to 1990 levels. This commitment was strengthened at the Conference of the Parties (COP29) in Baku, Azerbaijan, with the UK committing to a reduction in all Greenhouse Gas emissions by at least 81% on 1990 levels (excluding aviation and shipping emissions) (United Nations, 2024).

1.5.1.2 The Climate Change (Scotland) Act 2009 establishes the framework for reducing Scotland's Greenhouse Gas emissions. In response to the climate crisis, the Scottish Government declared a Climate Emergency in April 2019. The 2019 amendment to the Climate Change (Scotland) Act set an ambitious target to achieve net zero emissions by 2045. This ambition is further secured by other Scottish Policies and Directives, including the Climate Change Plan (2018 – 2032) and the Climate Change (Emissions Reduction Targets) (Scotland) Act 2024.

1.5.2 ENERGY

1.5.2.1 The Energy Act 2013 establishes the legislative framework to enable secure, affordable, and low-carbon energy. The Energy Act 2023 further confirms the UK's commitment to low-carbon energy, by supporting the UK's energy market to achieve energy independence, reliability and resilience by encouraging investment in the development of clean energy. The delivery of clean energy in the UK is also supported by Government strategies set out in the Powering-Up Britain (2023) paper and relevant National Policy Statements (2024).

1.5.2.2 In Scotland, The Scottish Energy Strategy outlines the vision for Scotland's energy system by 2050, emphasising a diverse energy mix to ensure secure and affordable energy. It sets targets for 2030: 50% of energy consumption from renewable sources and a 30% increase in energy productivity. This position is further supported by The Energy Strategy: Policy Statement (2021). Other Policy Statements and Directives, such as the Offshore Wind Policy Statement (2020), outline Scotland's ambitions for offshore wind, supporting the deployment of 11GW by 2030, emphasising the role of offshore wind in achieving Net Zero by 2045 and aligns with the 2017 Energy Strategy. This ambitious commitment is progressed in the Draft Energy Strategy and Just Transition Plan (2023), which aims for over 20 gigawatts of additional renewable energy capacity by 2030.

1.5.2.3 Under the Crown Estate Scotland's (CES) ScotWind leasing process, launched in June 2020, areas that were identified as suitable for renewable energy development were released to potential developers. The ScotWind leasing process resulted in the award of seabed option agreements for 17 sites, with a further three sites awarded in April 2022 as part of the ScotWind clearing process. With the additional clearing process, the ScotWind leasing round surpassed the Scottish Government's target of 11 gigawatts with 27.6 gigawatts of potential energy supply from 20 developments.

1.6 POLICY

Section 36 consent under the Electricity Act 1989

1.6.1.1 Scottish Ministers are responsible for determining applications under section 36 of the Electricity Act 1989 (as amended) for offshore generating stations with a capacity exceeding 1 megawatt within Scottish territorial waters (out to 12 nautical miles (nm) from the shore); or over 50MW in the Scottish offshore region (12 to 200 nm). These applications are processed by the Marine Directorate - Licensing Operations Team (MD-LOT) on behalf of Scottish Ministers.

1.6.1.2 The Offshore Project exceeds 1 MW and is located offshore within 0 to 12 nm and therefore requires section 36 consent to authorise the installation, operation, and maintenance of the offshore electricity generation and associated transmission infrastructure, including the Wind Turbine Generators and Offshore Cables, as well as to establish the overall principle of the development.

The Marine (Scotland) Act 2010

1.6.1.3 The Marine (Scotland) Act 2010 (the 2010 Act) imposes a duty to protect and enhance the marine environment within Scottish territorial waters (from Mean High Water Springs out to 12 nm offshore). It includes measures to promote economic investment and growth in areas such as marine renewables. Key provisions of the Act encompass marine planning; marine licensing; marine conservation; and enforcement.

1.6.1.4 Marine licences are required for the Offshore Project to carry out prescribed marine licensable activities, (such as, but not limited to, the deposition of cables and other objects on or within the seabed) and marine licence applications would be determined by Scottish Ministers under the 2010 Act. The Marine Licence application for the Offshore Project will run concurrently with the section 36 application.

1.6.2 RELEVANT EIA LEGISLATION

1.6.2.1 The EIAR provides the necessary information to satisfy the requirements of the following legislation:

- The Marine Works (EIA) (Scotland) Regulations 2017;
- The Electricity Works (EIA) (Scotland) Regulations 2017.

1.6.3 OTHER CONSENTS AND LEGISLATION

The Habitats and Birds Directives

1.6.3.1 The Habitats Regulations require consideration of potential effects from projects and plans on European sites, which are designated for particular features of conservation, including Special Areas of Conservation (SACs), Special Protection Area (SPAs) and Ramsar sites. A Habitats Regulations Appraisal (HRA) Screening Report (Spiorad na Mara Ltd, 2024) was submitted to the Marine Directorate in September 2024, which outlined the details of the Project and assessed whether there was the potential for the Project, individually or in combination with another plan or project, to have potential for Likely Significant Effect (LSE) on a European site. A HRA Screening Opinion from MD-LOT was received in November 2024 (MD-LOT, 2024).

1.6.3.2 An Offshore Report to inform Appropriate Assessment (RIAA) has been submitted alongside this EIAR to provide MD-LOT with the information required to assist them in undertaking an Appropriate Assessment and determining whether there is any 'adverse effect on site integrity' on European sites from the Offshore Project both alone and in-combination with other plans and projects (including the OTW Project).

Energy Act 2004

1.6.3.3 Sections 105 - 114 of the Energy Act 2004 contain statutory requirements regarding the decommissioning of Offshore Renewable Energy Installations (OREI) and their related electricity lines. Under the terms of the Energy Act, Scottish Ministers may require a person responsible for these installations or lines in Scottish Waters, or in a Scottish part of a Renewable Energy Zone (REZ) to prepare (and carry out) a costed decommissioning programme for submission to and approval by Scottish Ministers.

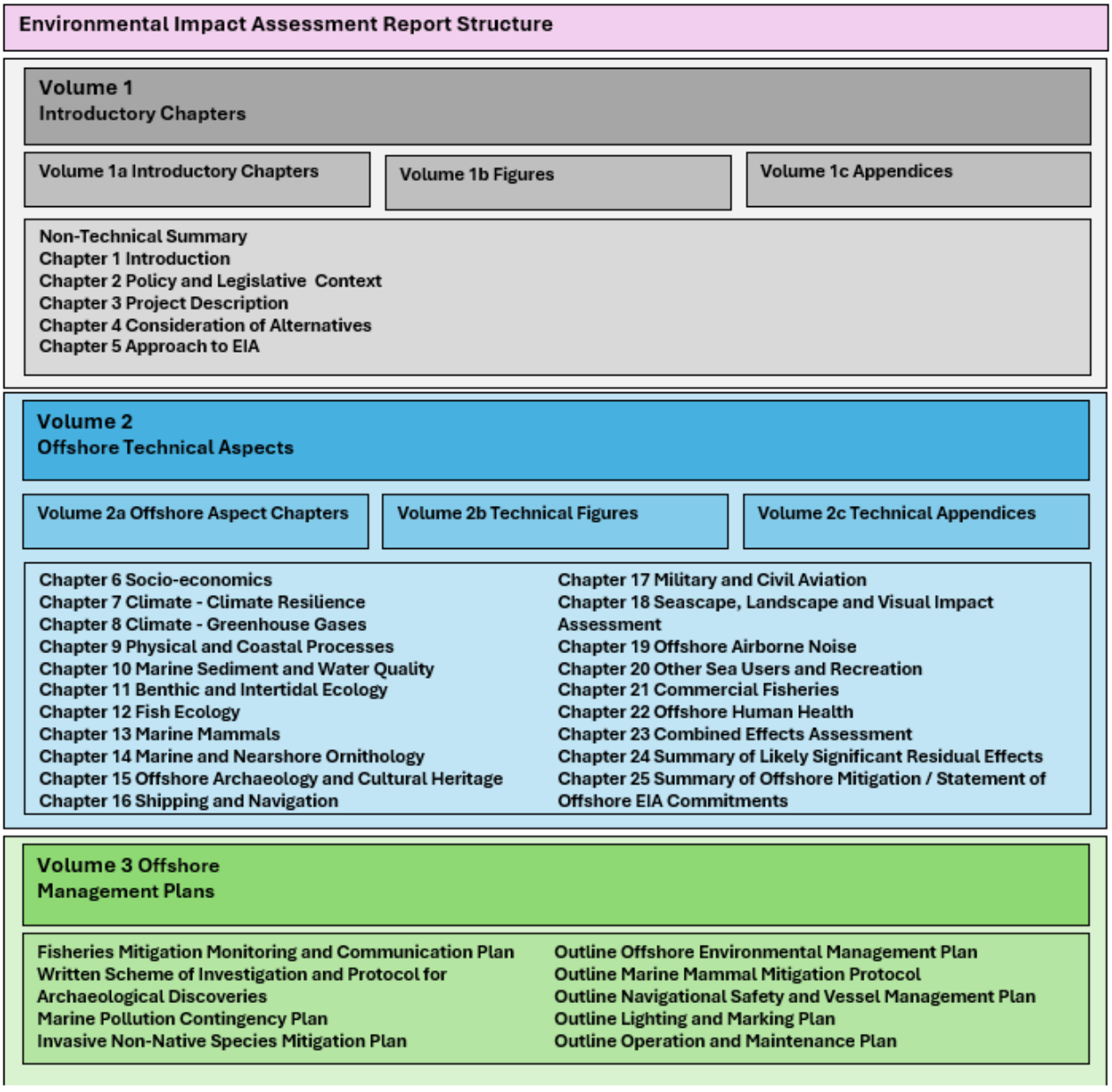
1.6.3.4 Section 95 and Schedule 16 of the Energy Act 2004 set out the basic requirements for applying for a safety zone to be placed around or adjacent to an Offshore Renewable Energy Installations (OREI). The standard dimension of a safety zone around the installation, during construction, major maintenance, possible extension or decommissioning is 500 metres.

1.7 STRUCTURE OF THE EIAR

1.7.1.1 To direct the reader to aspects relevant to the offshore application, this EIAR comprises three volumes, as outlined below, and shown in **Plate 1-3**.

- **Volume 1: Introductory chapters** (comprising Volume 1a (chapters); Volume 1b (figures); and Volume 1c (appendices));
- **Volume 2: Offshore technical aspects** (comprising Volume 2a (chapters); Volume 2b (figures); and Volume 2c (appendices));
- **Volume 3: Management Plans**.

Plate 1-3 EIAR Structure



2 PROJECT DESCRIPTION

2.1 INTRODUCTION

2.1.1.1 This section provides a summary of the activities and infrastructure associated with the Offshore Project, over the construction, operation and maintenance and decommissioning phases, defining the parameters for which section 36 consent and Marine Licence applications are being sought. This information is presented in further detail in **Chapter 3: Project Description**, **Volume 1a**.

2.1.1.2 The key parts of the offshore infrastructure that are explained in this section are:

- **Wind Turbine Generators**: these are devices that turn wind power into electrical energy.
- **Foundation types**: these are the types of structures that fix the Wind Turbine Generators to the seabed.
- **Array Cables**: these are electrical cables under the sea that connect the Wind Turbine Generators together and then either to land, or to an Offshore Substation Platform, depending on the final design of the Offshore Project.
- **Offshore Substation Platform**: this is a structure that might be needed to house electrical components that allow the electrical voltage to be changed so that it can connect to the national grid onshore.
- **Export Cables**: these are electrical cables under the sea that connect the Offshore Substation Platform to the land.
- **Landfall**: This is the location where the Export Cables / Array Cables meet the coast.

2.1.1.3 Some of these parts of the Project infrastructure are still being designed. The inclusion of design optionality as part of a parameter-based design envelope within Environmental Impact Assessment is widely understood and accepted for major infrastructure projects in the UK, providing that this is clearly communicated to the regulator and other stakeholders and consultees.

2.1.1.4 As particular design elements of the Offshore Project will be determined in the future in response to the development of the detailed design prior to construction, the Applicant has adopted a Project Design Envelope (PDE) approach in this EIAR. The Project Design Envelope Approach ensures that the environmental aspect assessments in this EIAR (**Chapter 6 – Chapter 23**, **Volume 2a**) have assessed appropriate 'maximum' parameters (known as the Maximum Design Scenario), which define the location, design and size of the Offshore Project. Consequently, future design decisions will be within the Maximum Design Scenario assessed, and therefore the likely significant effects of the final design will be equal to or less than the likely significant effects assessed for the Maximum Design Scenario.

2.2 KEY DESIGN OPTIONALITY RETAINED AT THIS STAGE

2.2.1.1 This section sets out the elements of the Offshore Project design where optionality has been retained at this stage of the design evolution with respect to Wind Turbine Generators and their foundations, and the energy transmission infrastructure.

2.2.1.2 The offshore wind industry continues to evolve in an effort to improve safety, efficiency and to reduce costs. The Applicant therefore requires flexibility in respect of Wind Turbine Generator choice or foundation types to ensure that they are not precluded from taking advantage of new, safer or more cost-effective technology which may become available between the development of the EIAR and the Offshore Project's construction.

2.2.2 WIND TURBINE GENERATORS

2.2.2.1 The Applicant requires flexibility in respect of Wind Turbine Generator choice to ensure that they are not precluded from taking advantage of new, safer or more cost-effective technology. To reflect this, the PDE presents 2 bounding scenarios that provide key maximum design parameters for assessment. Intermediate configurations (such as 52 WTGs with a blade tip height between 293.8 m and 338.4 m where the total rotor swept area falls within the defined swept area parameter) may also be deployed, on the basis that they fall within these bounding scenarios.

2.2.2.2 **Plate 2-1** provides an illustration of the parts which make up a WTG.

2.2.2.3 The Wind Turbine Generator parameters are described in further detail in **Chapter 3: Project Description**, **Volume 1a**, in summary these include:

- Up to 44 of the largest offshore Wind Turbine Generator type, with a maximum blade tip height of 338.4 m above Mean Sea Level (MSL), with a 30 m blade clearance above MSL, and associated foundations.
- Up to 60 of the smallest Wind Turbine Generator type, with a maximum blade tip height of 293.8 m above MSL, with a 30 m blade clearance above MSL, and associated foundations.

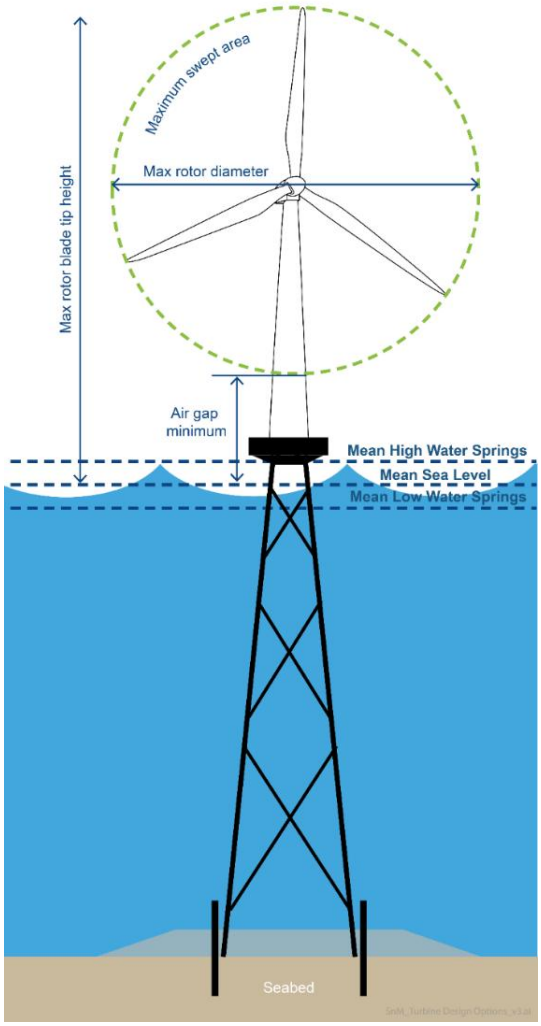
2.2.3 FOUNDATION TYPES

2.2.3.1 A range of foundation types and combinations of installation methods have been retained within the Project Design Envelope. These include:

- Multi leg jacket with pin piles installed by:
    - drilling and grouting pin piles; or
    - driving pin piles.
- Hybrid multi leg jacket with gravity base.

2.2.3.2 The foundation options are described in further detail in **Chapter 3: Project Description**, **Volume 1a** and represent the basis for the Maximum Design Envelope, for example jackets with up to 4 legs are included meaning that jackets with 3 legs could be deployed.

Plate 2-1 Wind Turbine Generator Schematic



2.3 Energy Transmission Infrastructure

2.3.1.1 The electrical design of the wind farm transmission system requires two High Voltage Alternating Current (HVAC) substations; one on the west side and one on the east side of Lewis/ *Leodhais*. These substations are required to transform and maintain the voltage of the electricity from the Wind Turbine Generators so that it is suitable for onward transmission and fulfil a critical role in the safe transmission of electricity.

2.3.1.2 As stated in **Section 1**, the OTW Project is subject to a separate consent application. That application includes the Landfall Substation on the west of Lewis/*Leodhais*, which may be required depending on the final design (see Scenario1 and Scenario 2 below). The OTW Project application also includes the substation on the east side of Lewis/*Leodhais* called the Grid Substation, which will receive electricity and connect the Project to the planned Lewis Hub Converter Station. The SSEN Lewis Hub is not part of the Project and is to be developed as part of the upgraded Western Isles HVDC Link under a separate application for consent.

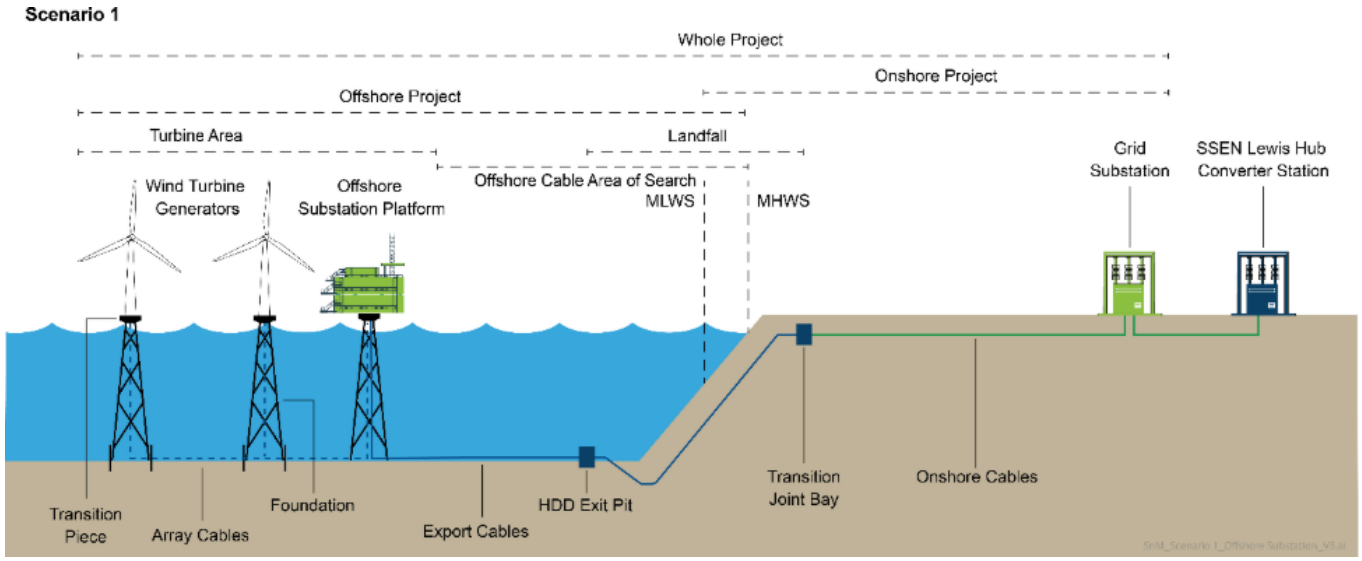
2.3.1.3 For the substation on the west side of the island, there are two scenarios to connect the Wind Turbine Generators to the Grid Substation:

***Scenario 1*: *An Offshore Substation Platform within the Turbine Area* (*Plate 2-2*)**

- 'Array Cables' will connect and transmit electricity from the Wind Turbine Generators to the Offshore Substation Platform;
- 'Export Cables' will transmit the collated power from the Offshore Substation Platform to the Landfall;
- At the Landfall, the 'Export Cables' will connect to the 'Onshore Cables' in Transition Joint Bays;
- The Onshore Cables will be buried and transmit the generated electricity to the Grid Substation.

2.3.1.4 If an Offshore Substation Platform is needed then it will consist of a foundation structure that connects to the seabed and supports a topside structure above the sea surface that houses electrical equipment.

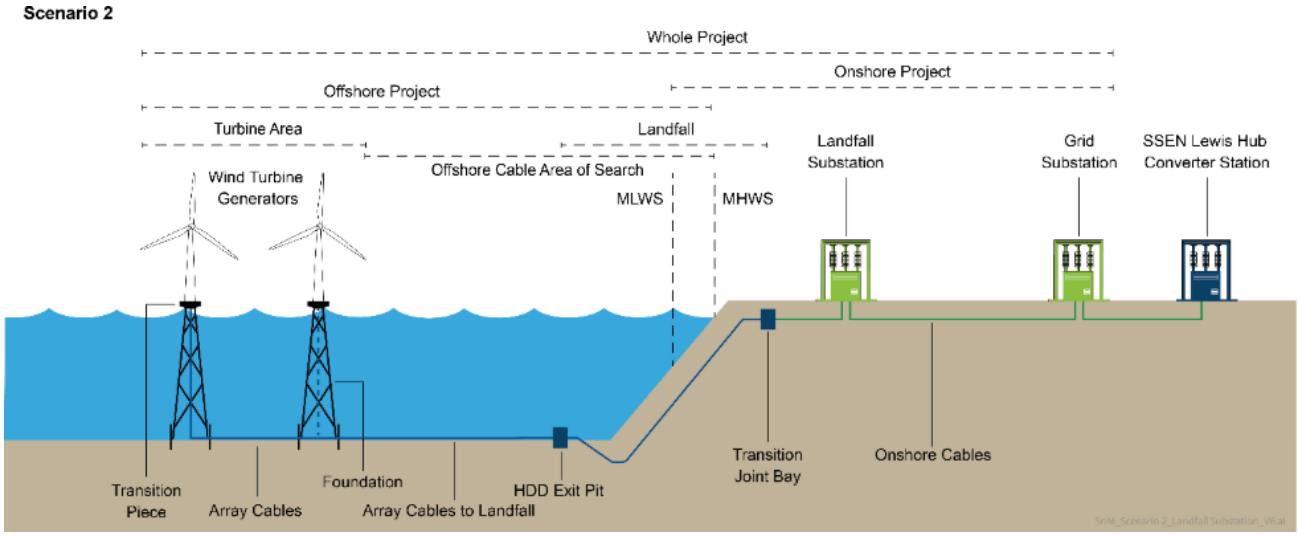
Plate 2-2 – Energy Transmission Infrastructure Scenario 1



***Scenario 2*: *An Onshore Landfall Substation* (*Plate 2-3*)**

- 'Array Cables' will connect multiple Wind Turbine Generators together in a string sequence;
- 'Array Cables to Landfall' will transmit the generated electricity from the last Wind Turbine Generator in the string sequence to the Landfall and connect to the Onshore Cables in Transition Joint Bays;
- From the Transition Joint Bays, the Onshore Cables will connect to the Landfall Substation on the west of the Isle of Lewis/*Eilean Leòdhais*;
- The collected power will be transmitted from the Landfall Substation to the Grid Substation via buried Onshore Cables

Plate 2-3 – Energy Transmission Infrastructure Scenario 2



2.3.1.5 As the Offshore Substation Platform would be within the Turbine Area, it has been assessed in this EIAR. The Onshore Landfall Substation and Grid Substation will be assessed within the separate consent application for the OTW Project, although they are considered within **Chapter 6 – Chapter 22, Volume 2a** where there is the potential for effects of the OTW Project to interact with the Offshore Project at a common receptor.

2.4 OFFSHORE PROJECT INFRASTRUCTURE

2.4.1.1 The Offshore Project boundary consists of three areas:

- **Array Area**: the total area within which the Wind Turbine Generators, associated foundations, Offshore Cables and the Offshore Substation Platform (if required) will be located;
- **Turbine Area**: a reduced area within the Array Area, within which all infrastructure that appears above the sea surface will be located;
- **Offshore Cable Area of Search**: which will accommodate the Array Cables to Landfall or the Export Cables along with the Horizontal Directional Drilling (HDD) Exit Pit Area.

2.5 SITE PREPARATION ACTIVITIES

2.5.1 PRE-CONSTRUCTION SURVEYS

2.5.1.1 Prior to the construction of the Offshore Project, surveys will likely be required to evaluate seabed conditions, identify potential hazards, and determine the suitability of the seabed for foundation installation, cable installation and any other seabed preparatory works, such as boulder clearance. The findings will build upon similar surveys that have already been undertaken to inform the EIA and the design evolution to date.

2.5.1.2 This is an important step to inform the final design, such as the final locations of the Wind Turbine Generators and cables, and the methods required to install them.

2.5.2 SEABED PREPARATION

2.5.2.1 Once all of the pre-construction activities have been completed, the seabed within the Offshore Project boundary will be prepared for the construction of the Offshore Project.

- Seabed preparation will comprise the clearing of boulders that could obstruct the installation of offshore infrastructure and the installation of offshore cables. Specialised equipment may be used to clear boulders from the seabed;
- To achieve a flat surface for the installation of Wind Turbine Generator (or Offshore Substation Platform) foundations and Offshore Cables, the placement of geotextile and/or gravel mattresses may be required;
- Following initial site investigations, it is not anticipated that unexploded ordnance (UXO) clearance will be required for the Offshore Project and as such clearance of UXO is not included in this EIAR or associated applications. However, should a requirement for UXO clearance become known following pre-construction surveys, the activity would be consented separately and ultimately, safely disposed of from the seabed.

2.6 CONSTRUCTION PHASE

2.6.1.1 An indicative construction programme for the Offshore Project is presented in **Table 2.1**. The programme illustrates the anticipated duration of the major construction/installation elements. The anticipated worst-case total construction duration is 5 years, during which construction works offshore and onshore would overlap.

2.6.1.2 It is anticipated that offshore construction works could commence in 2028/29, with an estimated completion in 2032/2033, with working hours expected to be 24 hours, 7 days a week during the construction period. Works within the offshore environment will only be undertaken during the April-October period, except for offshore Landfall construction works located within the HDD Exit Pit Area. This approach ensures that construction activities are aligned with favourable weather conditions and minimises disruptions to the local marine environment.

2.6.1.3 Details of the construction programme for OTW Project will be set out in the Onshore Project application, however it is understood to be over approximately the same period as the Offshore Project and it is anticipated that the construction period for each Onshore Substation will be around 36 months. The total expected duration of construction works relating to the cable route will be 2-3 years, within that 2028/9 - 2032/3 period.

2.6.1.4 A number of vessels will be required to complete the Offshore Project, including survey vessels, seabed preparation vessels, main installation vessels and their support vessels, crew transfer vessels, scour protection vessels, cable protection vessels and helicopters. Helicopters may be used for crew transfer during the construction phase.

Table 2.1 Indicative Construction Programme

	Year 1				Year 2				Year 3				Year 4				Year 5			
Activity	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Site Preparation																				
Foundation Installation																				
WTG and OSP (if required) Installation																				
Offshore Cable Installation																				
Landfall HDD installation																				
OTW Project Construction																				

2.7 OPERATION AND MAINTENANCE PHASE

2.7.1.1 After commissioning, the operational lifetime of the Offshore Project is expected to be 35 years. Operation and maintenance activities can be divided into two main categories, scheduled and unscheduled maintenance.

2.7.1.2 Operation and maintenance activities are based on the key principle that the Offshore Project will be designed to operate under minimal supervisory input, with the overall operation and maintenance strategy to be finalised once the operation and maintenance base and the final specifications of the Offshore Project are known. The operation and maintenance plan will take account of general practices as described in the **Outline Operation and Maintenance Plan**, **Volume 3**.

2.8 DECOMMISSIONING

2.8.1.1 At the end of the operational lifetime of the Offshore Project, it is anticipated that all structures above the seabed will be removed. The decommissioning sequence will generally be the reverse of the construction sequence and involve similar types and numbers of vessels and equipment. The decommissioning duration is anticipated to take a similar amount of time as the construction of the Offshore Project, although this indicative timing may reduce.

2.8.1.2 The provision of a Decommissioning Programme prior to the construction of the Offshore Project is a statutory requirement of the Energy Act 2004 and the Scotland Act 2016. The Applicant will follow all relevant guidance at the time of writing the Decommissioning Plan and all decommissioning activities will comply with all relevant legislation and guidance at that time.

2.8.1.3 At the end of the operational life of the Offshore Project, the Applicant will undertake an assessment to understand the viability for a design life extension (or repowering) versus decommissioning. If decision is made to seek to extend the design life beyond what has been assessed in the EIAR, the legislation and guidance in place at that time will be followed by the Applicant in consultation with regulators.

3 SITE SELECTION AND CONSIDERATION OF ALTERNATIVES

3.1 INTRODUCTION

3.1.1.1 The Offshore Project site selection and design evolution process has been a fundamental part of the EIA. It has been an iterative process which has been guided by detailed specialist engineering, environmental assessment and engagement with local stakeholders, regulatory stakeholders and non-governmental organisations. **Chapter 4: Consideration of Alternatives, Volume 1a** of the EIAR describes the reasonable alternatives that were considered during the EIA process.

3.2 SCOPING STAGE REFINEMENTS

3.2.1 Site Selection

3.2.1.1 The Sectoral Marine Plan for Offshore Wind Energy set the strategic framework for the first cycle of seabed leasing by Crown Estate Scotland for commercial-scale offshore wind and provides the strategically planned spatial footprint for offshore wind development in Scotland/*Alba*.

3.2.1.2 17 Draft Plan Options for the future development of commercial-scale offshore wind energy in Scotland/*Alba,* were developed using Opportunity and Constraints analysis and were subject to a Sustainability Appraisal and multiple assessments, supported by a period of public consultation between December 2019 – March 2020. Following this, 15 Plan Options were published in the Sectoral Marine Plan and adopted by Crown Estate Scotland. After completing a series of desk-based studies, the Applicant chose 1 of the 15 Plan Options, N4, as its preferred location for a fixed-bottom offshore wind development. The Applicant therefore submitted a bid into the ScotWind Process, which was accepted by Crown Estate Scotland.

3.2.1.3 The N4 Plan Option was refined from a 200 km^2 area to a 161 km^2 area, with due consideration of the technical, environmental and human constraints and the resultant implications for the energy yield of a potential development.

Grid Connection

3.2.1.4 In 2022, the National Grid Electricity Systems Operator (NGESO, predecessor prior to establishment of NESO) published the recommendations in *Pathway to 2030: Holistic Network Design (HND)* (NGESO, 2022). This included the North Scotland region, which the Project is a part of. The design recommended within Pathway to 2030: Holistic Network Design for the Project to connect to the Grid was to a new substation at Arnish/*Àirini*, on the Isle of Lewis/*Eilean Leòdhais*.

3.2.1.5 The Project will connect to the grid at the proposed Scottish and Southern Electricity Networks (SSEN) Lewis Hub (Alternating Current (AC) Substation and High-Voltage Direct Current (HVDC) Converter Station), with onward connection to the mainland via the SSEN Western Isles Connection Project.

3.3 OFFSHORE REFINEMENTS SINCE THE SCOPING STAGE

3.3.1 ARRAY AREA REFINEMENTS

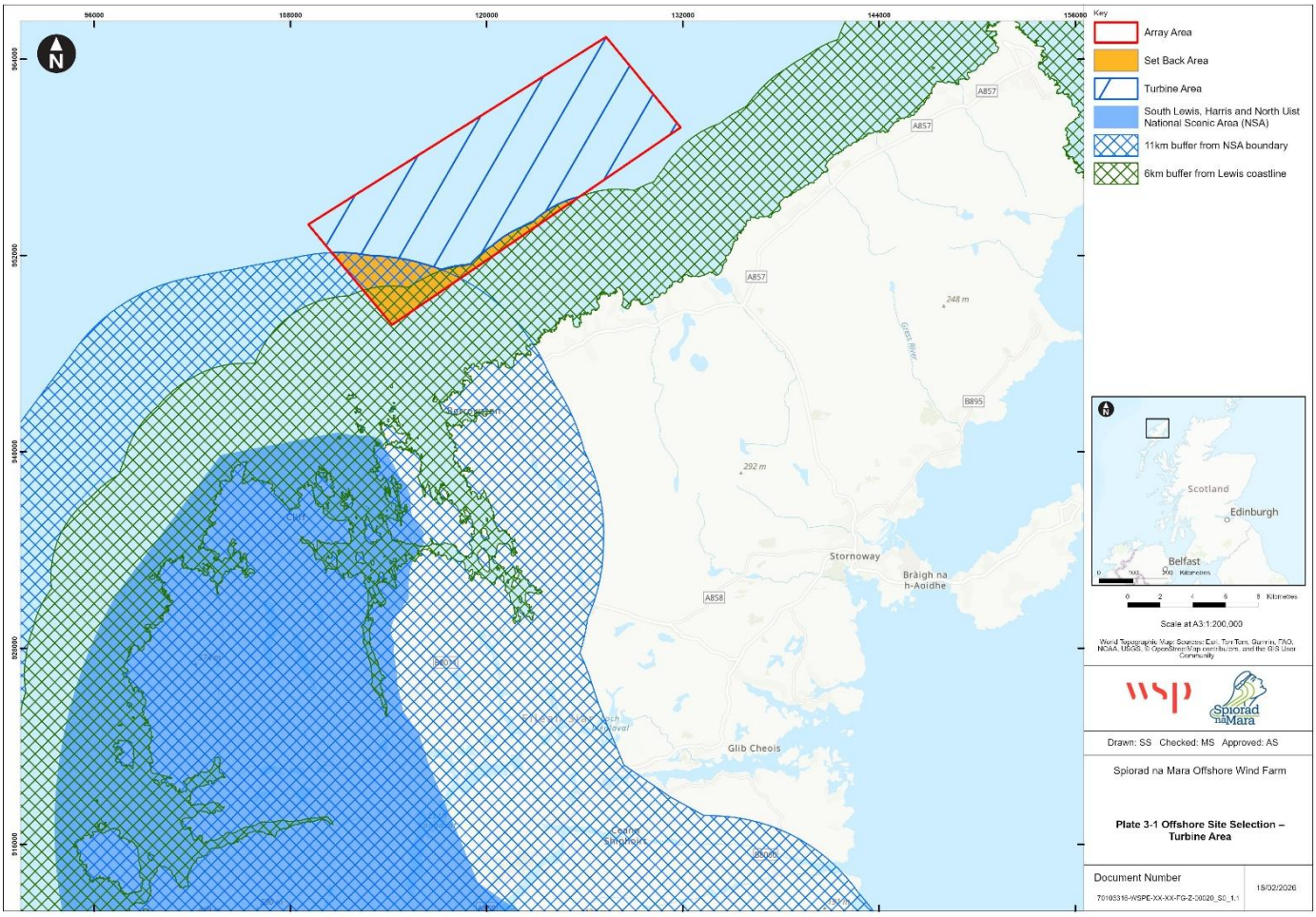
3.3.1.1 In response to consultation responses provided via the Scoping Opinion, subsequent consultation with NatureScot and the public was undertaken on the Isle of Lewis/*Leodhais*. As a result, a design review of the Array Area was undertaken, which refined the Offshore Project parameters that had been determined during the Scoping phase of the Project.

3.3.1.2 Further feedback received during Public Consultation 1 (2024) highlighted concerns from the local community with respect to the visual impact of the Offshore Project. In response to this, a setback distance of 11km from the National Scenic Area and a 6km setback distance from the coastline of the Isle of Lewis/*Leodhais* was established, to create the Turbine Area (**Plate 3-1**).

3.3.1.3 This refinement ensures that impacts on the Special Landscape Qualities of the North Uist National Scenic Area and regionally distinctive parts of the west coast of Lewis/*Eilean Leòdhais* have been minimised in the project design. It also responded to community feedback about the anticipated visual impact of the Wind Turbine Generators.

3.3.1.4 The refinement of the Turbine Area also contributed to reducing impacts on birds, fish, and shipping and navigation while responding to technical constraints and to maximising capacity to achieve the objectives of the Project.

Plate 3-1 Turbine Area Refinement



3.3.2 WIND TURBINE GENERATORS

3.3.2.1 The EIA Scoping Report defined the maximum parameters for the Wind Turbine Generators as up to 66 turbines with a blade tip height of 380 m above mean sea level. This number was refined prior to Public Consultation 1, with further feedback from the local community emphasising the importance of minimising the visual impacts of the Offshore Project. In response to this feedback, the Applicant further reduced the maximum parameters in the Project Design Envelope, including the number of Wind Turbine Generators, blade tip height and blade width.

3.3.2.2 The Applicant also increased the Minimum Blade Tip Clearance (Air Gap) above mean sea level to 30 m, which is considered to be the feasible height for the Air Gap at this time, when considering engineering risk, safety at sea, and collision risk impact to seabirds.

3.3.2.3 **Table 3.1** presents the design refinement for the Wind Turbine Generators, before and after Public Consultation 1.

Table 3.1 Summary of Wind Turbine Generator design parameter refinement

	Scoping Stage	Pre-Application Consultation 1	Application Submission
Number of Wind Turbine Generators	Up to 66	48 – 66	44 – 60
Blade tip height (metres above mean sea level)	380	365 – 300	339 - 293
Minimum Blade Tip Clearance (Air Gap) (metres above mean sea level)	22	22	30

Turbine Layout

3.3.2.4 At this stage of the Project, Wind Turbine Generator and Offshore Cable layout is indicative within the Turbine Area and the final layout will be determined during design optimisation based on further investigations and in communication with stakeholders post-consent.

3.3.2.5 For the purposes of assessment in this EIAR, a 'grid' layout optimises the available space, constituting the highest density layout of Wind Turbine Generators, and is therefore a realistic worst-case for potential effects associated with seascape, landscape and visual.

3.3.3 FOUNDATION TYPE

3.3.3.1 The selection of foundation types for the Offshore Project was primarily driven by engineering feasibility. Environmental factors were considered alongside the key feasibility considerations of ground conditions, water depth, metocean and wind conditions, fabrication and installation requirements/constraints, turbine size and constructability.

3.3.3.2 Screening and semi-qualitative assessment of different foundation types concluded that jacket foundations with driven (using percussive piling, which is a method for hammering a structure into the seabed) or drilled and grouted pin piles were identified as the most suitable option for the majority of the site, with alternative options identified as mitigation for specific installation or supply chain risks.

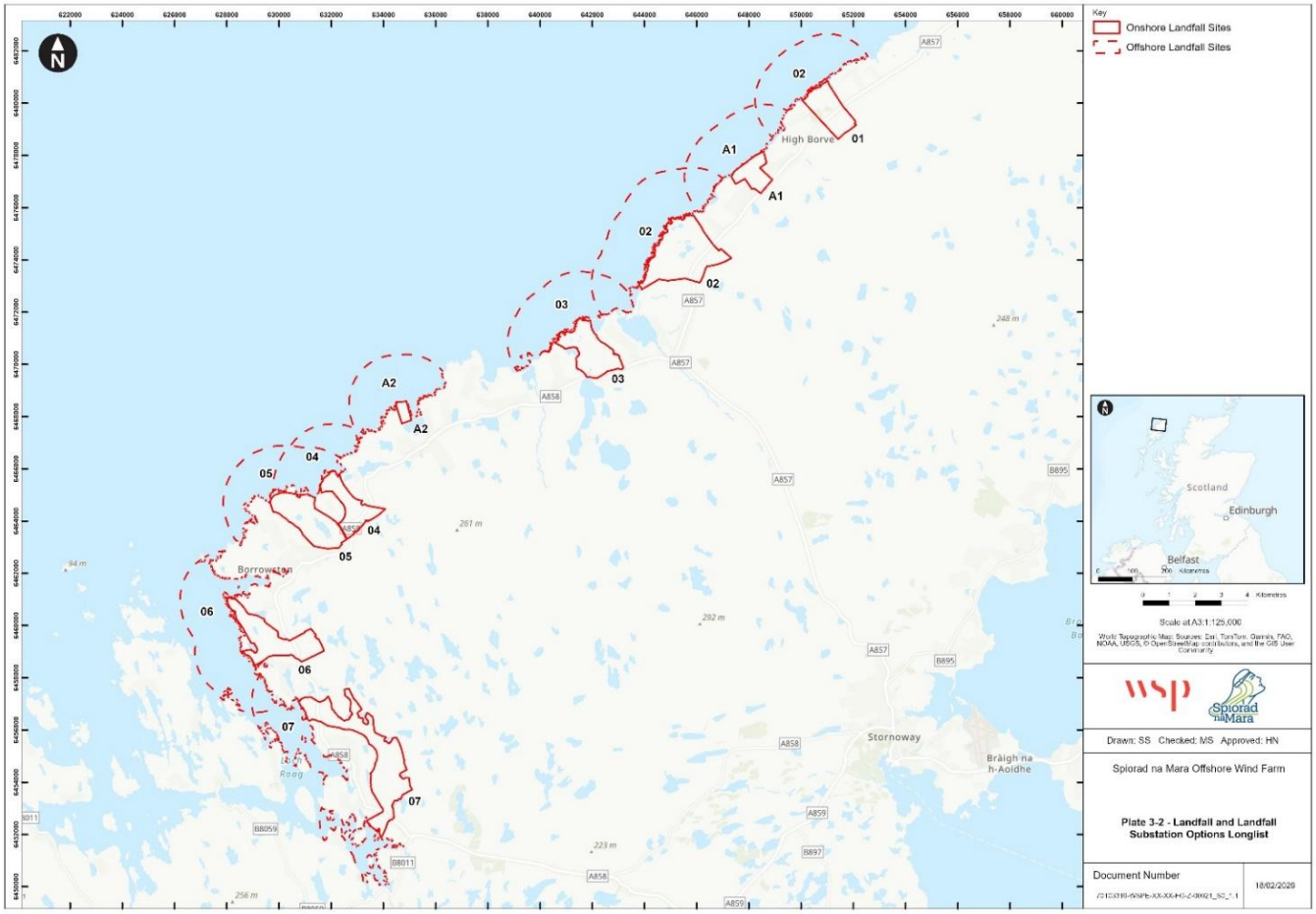
3.3.3.3 Due to the location of the Offshore Project, there are sensitive marine ecological features within the vicinity of the Offshore Project, such as migratory Atlantic salmon. Underwater Noise Modelling has therefore been undertaken by the Applicant to understand the Zone of Influence associated with different foundation installation approaches to inform how this can be mitigated. This has culminated in further design refinement of the Offshore Project piling approach and a package of embedded mitigation measures, which has been consulted upon with key stakeholders.

3.3.4 LANDFALL AND OFFSHORE CABLE CORRIDOR

3.3.4.1 In order to identify the proposed Landfall location for the Project, the Applicant undertook an initial screening and constraints analysis. This compared the options based on a detailed review of onshore and offshore constraints along the west coast of the Isle of Lewis within an identified Area of Search.

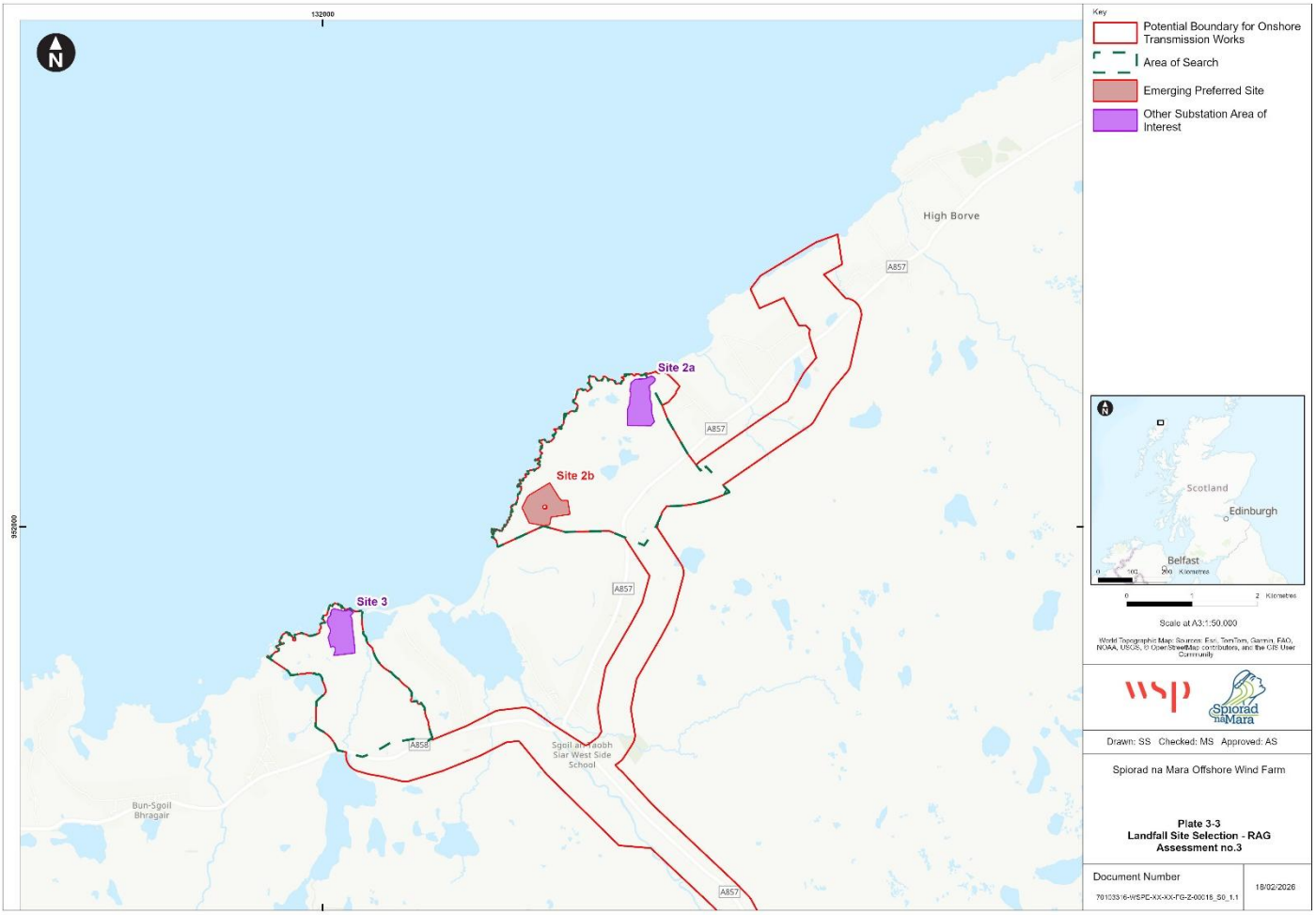
3.3.4.2 The initial screening exercise identified 7 Areas of Search, which were then considered in the first assessment, with due consideration of the constraints relevant to the Area of Search. As a result of this initial assessment, 2 additional Areas of Search were identified and considered. Following this, 4 Areas of Search were then recommended to be taken forward for further investigation and consultation, noting that the key constraints compared were primarily onshore, due to relative similarity in the offshore constraints across the 9 Areas of Search (**Plate 3-2**).

Plate 3-2 Landfall Site Selection Options



3.3.4.3 Further detailed investigation, including a site visit and comparative scoring, determined that 2 Areas of Search were under consideration for inclusion in the EIAR, 1 of which was split into two sub-Areas of Search (2a and 2b), for consideration in the final landfall assessment (**Plate 3-3**). Ultimately, Area of Search 2b was identified as the preferred Landfall site option. Further consideration of this process is provided in **Chapter 4: Consideration of Alternatives**, **Volume 2a**.

Plate 3-3 Landfall Site Selection Assessment



3.3.5 OFFSHORE CABLE AREA OF SEARCH REFINEMENT

3.3.5.1 After the Landfall location was identified, an Offshore Cable Area of Search was designed, within which Offshore Cables transmitting electricity from the Wind Turbine Generators to Landfall would be located.

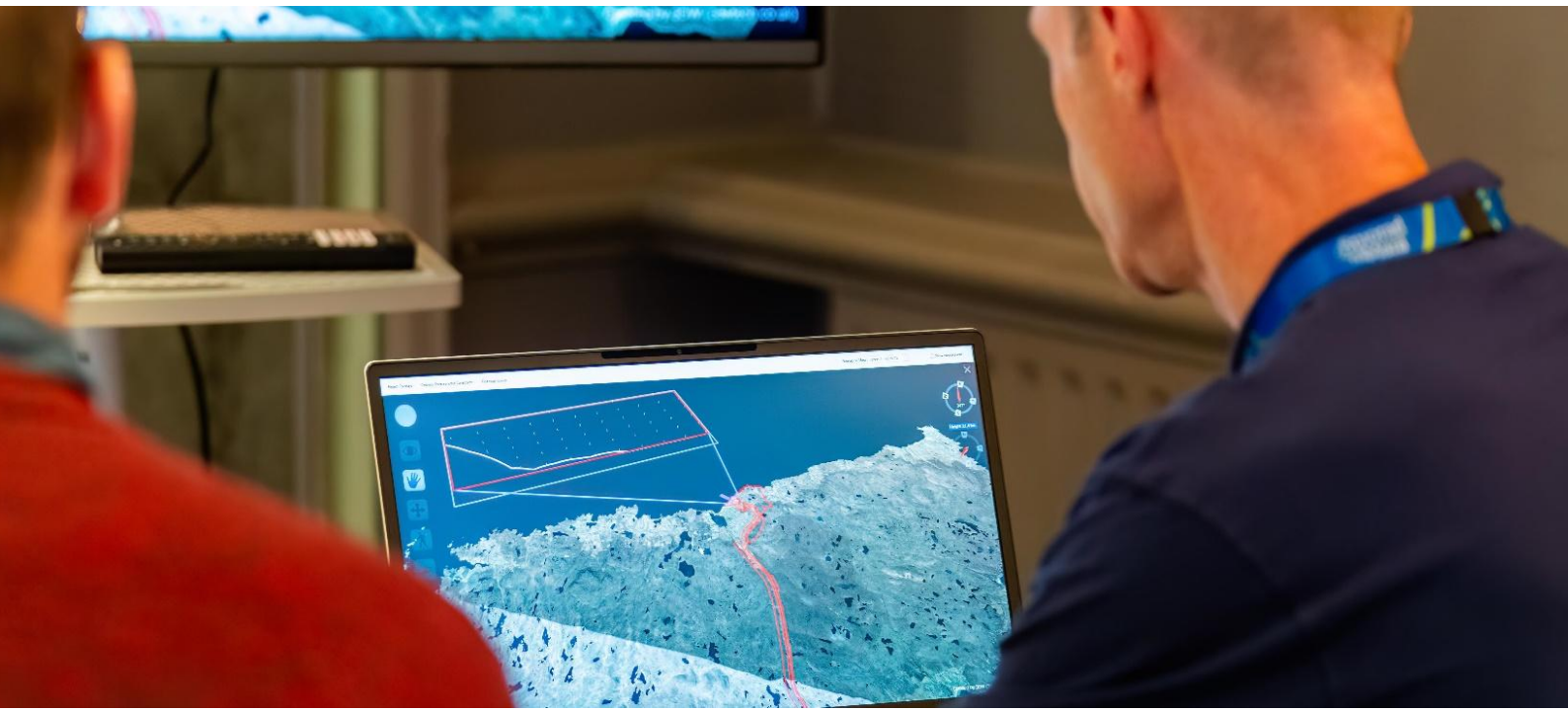
3.3.5.2 During the EIA process, it was identified that existing key fishing grounds are located within the Offshore Cable Area of Search and due to the potential for Offshore Cables to be present across the Offshore Cable Area of Search this could impact the commercial fishing industry.

3.3.5.3 The Applicant therefore undertook studies and consulted with commercial fisheries stakeholders to understand how the Offshore Cable Area of Search could be refined to minimise the impact on commercial fisheries. Ultimately, a smaller Offshore Cable Area of Search was identified, reducing the area by 48%, from 90.6 km^2 to 47.0 km^2.

3.3.6 TRANSMISSION SUBSTATION APPROACH

3.3.6.1 As presented in **Plate 2-2** and **Plate 2-3**, the EIAR considers two scenarios for delivery of either an Offshore Substation Platform (Scenario 1) or a Landfall Substation (Scenario 2). Only one of these two scenarios will be delivered. It is necessary to retain both options even though only one will be executed as there are several aspects of the design that require flexibility to be retained at this stage of development.

The main consideration is centred around what technology may or may not be available at the time of project execution, so by retaining both options, the Project will be able to assess any new technology developed or made available in the market between the time of this assessment and detailed design and the consequent feasibility of the two options for the Project.



4 APPROACH TO ENVIRONMENTAL IMPACT ASSESSMENT

4.1 INTRODUCTION

4.1.1.1 This section provides a summary of the overarching methodology and approach applied to identify, assess and present the likely significant environmental effects (positive and negative) associated with the Offshore Project and the mitigation required to prevent, reduce, or offset these effects, where possible. Each of the **EIAR Chapters 6 - 23, Volume 2a** defines the assessment methodology applicable to their environmental aspect, which may differ from the overarching methodology defined in **Chapter: Approach to EIA**, **Volume 1a**, to accommodate to bespoke guidance, unique environmental conditions, or regulatory requirements.

4.1.1.2 The EIA informs the decision-making process for development consent to be granted. In Scotland/*Alba*, the EIA process culminates in the provision of an EIA Report (EIAR) written in accordance with the applicable EIA Regulations as presented in Section 1.6 of this Non-Technical Summary.

4.1.1.3 In line with relevant guidance, the Applicant seeks to provide a well-coordinated EIAR, based on comprehensive scoping exercises and early-stage stakeholder and public consultation to provide assessments which are proportionate and effective, to inform the decision-making process.

4.2 KEY STAGES

4.2.1.1 The key stages of the EIA process are outlined in Scottish Government guidance and can be summarised as follows:

- **EIA Screening** – determines the need for an EIA;
- **EIA Scoping** – defines the scope of work for the EIA including environmental aspects to be considered, describes the methodology of assessment (including design envelope parameters (refer to Section 2.1)) and identifies potentially significant effects;
- **Preparation of EIA Report** – including outlining the maximum design scenario for each assessment (refer to Section 2.1); baseline studies, assessment of environmental effects, design iteration, development of mitigation and monitoring requirements, and evaluation of likely significant residual effects;
- **Application Submission and Consultation** – EIAR and consent application publicised and interested parties/the public given an opportunity to provide their views on it;
- **Decision-Making** – consent application determined by the competent authorities;
- **Post-Decision** – commencement of the Offshore Project including any environmental measures and monitoring required by the competent authorities.

4.3 CONSULTATION AND ENGAGEMENT

4.3.1 EARLY ENGAGEMENT

4.3.1.1 In November 2023, a stakeholder mapping workshop was carried out for the Project, for which stakeholder lists were developed, based on known stakeholders identified during the pre-bidding phases of the ScotWind Leasing process and during the early design phase and initial surveys for the Project. The output of this exercise was a comprehensive database of almost 300 stakeholders, across 9 segments, such as 'community', 'political' and 'fisheries and marine'.

4.3.1.2 After the N4 Plan Option agreement was entered into to determine the location for the Offshore Project in April 2022, public information events were held in May 2022 in Galson/*Gàbhsann*, Breasclete/*Brèascleit*, Grinneabhat, and Stornoway/*Steòrnabhagh*, to present the initial Project concept and gather early community feedback for its development.

4.3.2 EIA SCOPING

4.3.2.1 EIA Scoping Consultation culminated in the development and submission of the Project's Scoping Report which covered the Offshore Project and the OTW Project. During this time the Project team significantly expanded its public-facing communications and deepened engagement with key stakeholders. This was achieved through a combination of targeted outreach, in-person meetings, online briefings, and participation in local events.

4.3.2.2 A series of 4 public information events were held across 4 locations in June 2023: Stornoway/*Steòrnabhagh*, Barvas/*Barabhas*, Carloway/*Càrlabhagh*, and Bernera/*Beàrnaraigh Mòr*, during which several members of the Project team were on hand to answer questions on specialist topics and receive feedback from members of the local community, who also received updates on the latest progress made on the Project.

4.3.2.3 The Scoping Report and request for a Scoping Opinion to Marine Directorate – Licensing Operations Team (MD-LOT) was submitted in September 2023 (Spiorad na Mara Limited, 2023). A Scoping Opinion was received in May 2024 from MD-LOT (MD-LOT, 2024). The Scoping Opinion acts as a preliminary assessment by MD-LOT of the methodology, baseline and potential impacts outlined within the Scoping Report.

4.3.3 PRE-APPLICATION CONSULTATION (PAC)

4.3.3.1 Two phases of public pre-application consultation were undertaken in relation to the Project as a whole in accordance with the formal Pre-Application Consultation process. These consultations satisfy the requirements of the Marine Licensing (Pre-Application Consultation) (Scotland) Regulations 2013 and the Marine Scotland Act 2010, and the Energy Consents Unit Good Practice Guidance for Applications under Section 36 and 37 of the Electricity Act 1989 published by the Scottish Government (2022).

4.3.3.2 Public Consultation 1 was held in 2024, and Public Consultation 2 was held in 2025, both providing a month long virtual exhibition to complement the in-person public exhibition events (7 during PC1 and 5 during PC2) located at community venues throughout Lewis/*Eilean Leòdhais*. Additionally, in-person appointments and stakeholder briefings were provided during these periods to maximise public participation.

4.3.4 STATUTORY AND NON-STATUTORY CONSULTATION

4.3.4.1 Statutory and non-statutory consultation enabled regulators, local authorities, and stakeholders to provide feedback on the proposed EIA assessment approach. Non-statutory consultation also took place to engage local communities and interest groups, helping to shape the Project design ahead of formal public consultation.

4.3.5 COMMUNITY AND WIDER PUBLIC ENGAGEMENT

4.3.5.1 In Autumn 2022, the Applicant appointed a dedicated Community Liaison Officer (CLO) based in Stornoway/*Steòrnabhagh*, to strengthen and deepen local engagement. This ambition was further enhanced by the establishment of a Project office in Stornoway*/Steòrnabhagh* and the appointment of a dedicated Consultation and Local Engagement Lead in 2023. Engagement with the local community has been ongoing since then, including meetings with community councils, trusts, community and voluntary organisations, and third-sector agencies. Throughout 2024 and early 2025, the community engagement team hosted community drop-ins, allowing members of the community to drop in to pre-advertised local venues on particular dates and ask questions about the Project. The team has been available on an ongoing basis for one-to-one and small group meetings.

4.3.5.2 The Applicant has delivered dedicated engagement with representatives of the fisheries industry since the inception of the Project, strengthened by the appointments of Company Fisheries Liaison Officer (CFLO) and Fisheries Industry Representative (FIR) since 2023.

4.3.5.3 The Applicant is also committed to creating meaningful opportunities for local businesses and helping them prepare for future work packages associated with the Project. At the beginning of 2025, the Project appointed a locally based Supply Chain and Skills Development Officer to provide a central point of contact for local supply chain stakeholders and to improve the integration of local businesses into the Project's procurement processes as well as the wider renewables-based supply chain.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PUBLIC CONSULTATION
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4.4 EMBEDDED ENVIRONMENTAL MEASURES

4.4.1.1 There are 3 forms of mitigation that can be categorised as follows:

- **Primary (inherent)**: Measures integrated (or embedded) into the Offshore Project's design to reduce or avoid the likelihood or magnitude of negative environmental effects, such as location or design choices
- **Secondary (foreseeable)**: Additional measures implemented to further minimise environmental effects to 'Not Significant' levels (when appropriate), which are not part of the core design of the Offshore Project;
- **Tertiary (inexorable)**: Measures required by standard practices or legislative requirements, independent of the EIA process, meaning they would be implemented regardless of the EIA findings.

4.4.1.2 Embedded environmental measures are primary or tertiary measures that are identified and incorporated into the design evolution of the Offshore Project to minimise potential environmental effects. As these environmental measures are assumed to be integral to the Offshore Project's design prior to any evaluation, they are taken into account as part of the parameters of the Offshore Project when assessing the magnitude of change and subsequent significance of effects.

4.4.1.3 The Applicant is required to produce a number of management plans for different environmental topics, which must be agreed with regulators and relevant stakeholders before construction can commence. A management plan is a plan that defines what environmental measures are required to reduce the impact of Offshore Project activities, when they need to be completed and who is responsible, so that activities are safe for the environment, sensitive receptors and the Project workforce.

4.4.1.4 A Commitments Register has been used as the primary tool to capture and agree all embedded environmental measures (such as the production of a specific management plan) and the mechanism of securing them. Measures applicable to each topic are summarised under each topic section in Section 5 of this NTS and also in **Chapter 25, Volume 2a**.

4.5 ASSESSMENT METHODOLOGY

4.5.1 IMPACT ASSESSMENT

4.5.1.1 The EIA for the Offshore Project utilises the 'source-pathway-receptor' model to identify relevant receptors, where applicable. This model highlights potential impacts of the Offshore Project on environmental receptors, establishing a clear link between impact sources and receptor. The model comprises three key components:

- **Source**, the origin of potential impacts, such as offshore construction activities that may cause disturbance of sediment that becomes mobilised into the water column;

- **Pathway**, the route through which these potential impacts reach a receptor, such as re-deposition of sediment on the seabed;
- **Receptor**, the environmental element affected, which can include physical, ecological, or human components, such as immobile species on the seabed in the above example.

4.5.1.2 The disturbance of sediment, re-deposition of sediment, and immobile species mentioned above provide an example of a source-pathway-receptor model, the potential result of which may be a smothering effect on the immobile species.

4.5.1.3 An impact is considered to have an effect where a pathway is identified between a source and a receptor, with the Offshore Project resulting in both positive and negative effects over varying areas and time periods. These effects are assessed and a relative significance of the effect on specific receptors is defined and reported within the relevant **Chapters 6 – 22**, **Volume 2a**.

4.5.1.4 To determine the significance of an effect, the relationship between the sensitivity of a receptor is considered in the context of the magnitude of the effect in **Chapters 6 – 22**, **Volume 2a**, where sensitivity and magnitude are each categorised as either '**negligible**, **low**, **medium**, or **high**'. This relationship is then evaluated to determine whether the overall effect is considered to be **negligible**, **minor**, **moderate**, or **major**.

4.5.1.5 In this EIAR, the following applies:

- 'Major' effects are considered to be **Significant**;
- 'Moderate' effects are considered to be **Potentially Significant**;
- 'Minor' and 'negligible' effects are considered to be **Not Significant**.

4.5.1.6 Where a 'Moderate' (**Potentially Significant**) effect is determined after review of relevant data and analysis, expert judgement considers the wider context of the environmental effect pathway and seeks to define additional mitigation measures, to ensure that the pathway does not result in a **Significant** effect to the receiving environment.

4.5.2 COMBINED EFFECTS

4.5.2.1 In the EIAR, the term "combined effects" refers to the inter-relationships between environmental aspects that may lead to different or greater environmental effects than in isolation. Such effects are concerned with the likely significant effects from multiple impacts and activities from construction, operation, and maintenance, and decommissioning of the Offshore Project on the same receptor, or group of receptors.

4.5.2.2 Combined effects can occur across more than one phase or through the combined impacts of multiple factors on a single receptor.

4.5.3 CONSIDERATION OF THE ONSHORE TRANSMISSION WORKS PROJECT

4.5.3.1 The Onshore Transmission Works Project will be the subject of a separate application, so to ensure the Offshore Project and Onshore Transmission Works Project are considered holistically and not in isolation of each other. Consideration is given within the technical topic chapters (**Chapter 6 – 23, Volume 2a**) to instances where Onshore Transmission Works Project has the potential to interact with effects arising as a result of the Offshore Project, at the same receptor or receptor group.

4.5.4 CUMULATIVE EFFECTS

4.5.4.1 In the EIAR, the term 'cumulative effect' refers to assessment of multiple impacts and activities from several developments that may have insignificant impacts on a common receptor individually, but which together represent a significant cumulative effect. The cumulative effects assessment has been undertaken using the outcomes and levels of significance determined through the EIA Process.

4.5.5 TRANSBOUNDARY

4.5.5.1 Transboundary effects occur when a development in one European Economic Area (EEA) State impacts the environment of another EEA State(s). The '*Convention on Environmental Impact Assessment in a Transboundary Context*' (Espoo Convention, 1991), adopted by the United Nations Economic Commission for Europe to enhance the cooperation between EEA states in assessing environmental effects in a transboundary context. Each technical topic chapter (**Chapter 6 – 23**, **Volume 2a**) considers transboundary effects in the context of relevant impact pathways within the assessment.

5 ENVIRONMENTAL IMPACT ASSESSMENT

5.1 INTRODUCTION

5.1.1.1 This section provides a summary of the assessment of likely significant effects of the Offshore Project on receptors including:

- **Socio-economics;**
- **Climate - Climate Resilience;**
- **Climate - Greenhouse Gases;**
- **Physical and Coastal Processes;**
- **Marine Sediment and Water Quality;**
- **Benthic and Intertidal Ecology;**
- **Fish Ecology;**
- **Marine Mammals;**
- **Marine and Nearshore Ornithology;**
- **Offshore Archaeology and Cultural Heritage;**
- **Shipping and Navigation;**
- **Military and Civil Aviation;**
- **Seascape, Landscape and Visual Impact Assessment;**
- **Offshore Airborne Noise;**
- **Other Sea Users and Recreation;**
- **Commercial Fisheries;**
- **Offshore Human Health.**

5.2 SOCIO-ECONOMICS

How effects on socio-economics have been assessed

5.2.1.1 The socio-economics assessment considers the likely significant socio-economic effects in terms of jobs and GVA, wider socio-economic effects and socio-cultural effects. These are considered at a national (Scotland/*Alba)*, "local" (relating to the local authority area of Comhairle nan Eilean Siar (CnES)), and island level (Isles of Lewis and Harris/*Leòdhas agus Na Hearadh*), with two "smaller study areas" considered on the Isle of Lewis (west coast of Lewis/*Eilean Leòdhais* and Stornoway/*Steòrnabhagh*).

5.2.1.2 Data to inform the socio-economics assessment has been gathered from a range of desk-based data sources and information gathered during public consultation and/or through ongoing engagement in and with local communities and interest groups, further supplemented by a series of focus groups.

Baseline environment

5.2.1.3 The socio-economic context is considered in terms of employment and economic activity, earnings, productivity and economic structure of the Western Isles. The wider socio-economic context considers key local sectors including commercial fishing, aquaculture and fish/shellfish processing, and tourism. Although there is evidence of economic growth in the region, the rate is behind the national average, with primary industries such as agriculture, forestry and fishing employing a larger proportion of the workforce than the national average. This is considered to be related to continued traditional practices in the Western Isles, such as crofting.

5.2.1.4 In the socio-cultural context, a 6% population decline has been recorded between 2011 and 2022 in the Western Isles, which is projected to continue, with an age profile that is older than the national average. Key challenges in the Western Isles are identified as access to housing, social infrastructure, and transport and connectivity. The Gaelic language is identified as a key feature of local culture and community identity, particularly in communities on the west coast of Lewis/*Eilean Leòdhais*.

Embedded environmental measures

5.2.1.5 A range of environmental measures that relate to socio-economic impacts are embedded as part of the Offshore Project design to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the socio-economic assessment are:

- M037: Use of local tour operator vessels or fishing vessels that meet relevant safety requirements, where possible to assist future Project activities, such as guard vessel opportunities.
- M041: The offshore construction workforce to be accommodated on vessels, with the exception of certain limited circumstances such as crew change over and leave, to reduce

additional demand for housing / tourist accommodation on Lewis. Medical facilities to be provided on board vessels to treat minor injuries / illness and reduce additional pressure on existing services.

- M045: A Cultural Integration Plan will be developed prior to the commencement of construction which will put in place measures to support the integration of incoming workers and reduce impacts on local communities and cultural practices. This will include the continuation of awareness training and island induction for all project staff and contractors, and the use of a settlement officer to support cultural integration during construction and operation and maintenance.
- M049: The Project is committed to maximising opportunities for local people to apply for jobs created by the Project, and will continue to work with the supply chain and other local stakeholders to develop the workforce skills required for the construction and operation of the Project. In advance of construction, the Project will support skills development initiatives, and will work with stakeholders and other agencies such as HIE on wider skills development initiatives. The Project will also develop tender criteria to promote local skills and employment.

Additional environmental measures

5.2.1.6 Additional environmental measures have been developed to provide secondary mitigation in instances where likely significant effects were identified in the initial assessment:

- A004: The Project has already engaged with Outer Hebrides Tourism (also known as Visit Outer Hebrides), and is committed to developing a Tourism Support Strategy, through which it can – in consultation with Outer Hebrides Tourism and other relevant stakeholders – support existing tourism initiatives and, where appropriate, collaborate to explore new opportunities for tourism on the islands, in particular in the area of ecotourism associated with renewable energy. Other specific initiatives the Project will include in such a strategy include:
  - consultation with local organisations to discuss opportunities to enhance the Multiuse Pathway along Barvas Moor Road that will be delivered as part of the Onshore Project;
  - opportunities to incorporate learning and visitor opportunities into the Operations and Maintenance Base; and
  - potential for information stops along the west coast of Lewis to showcase the area's cultural heritage and biodiversity, subject to consultation with CnES and further planning approval if required.

Likely significant residual effects

5.2.1.7 It is anticipated that the Offshore Project will result in beneficial effects which are significant in EIA terms, with respect to employment during the Operation and Maintenance phase. All other effects are concluded to be **Not Significant** with the application and adherence to appropriate embedded and additional mitigation measures.

5.2.1.8 **No Significant** effects as a result of the OTW Project of greater significance compared to the impacts considered alone were identified for socio-economic receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.2.1.9 **No Significant** cumulative effects have been identified in relation to the Project on socio-economics from construction, operation and maintenance, and decommissioning activities.

5.2.1.10 **No Significant** combined effects of greater significance compared to the impacts considered alone were identified for socio-economic receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.2.1.11 **No Significant** transboundary effects have been identified in relation to the Offshore Project on socio-economics from construction, operation and maintenance, and decommissioning activities.

5.3 CLIMATE RESILIENCE

How effects on climate have been assessed

5.3.1.1 The Climate Resilience assessment considers the impact of climate change on the Offshore Project and its associated infrastructure and activities. The Climate Resilience assessment methodology is set out in two stages:

- The **Climate Vulnerability Assessment** considers the vulnerability of identified receptors to climate hazards across the Offshore Project's lifetime. The vulnerability of the receptors depends on the sensitivity and exposure of the receptors to climate trends identified within the future baseline. Potentially significant effects are considered where receptors of 'medium' vulnerability to climate hazards are identified and taken forward to the Climate Resilience assessment.
- The **Climate Resilience Assessment** assesses the likelihood and the consequence of climate change impacts on the Offshore Project.

5.3.1.2 The Climate Resilience Assessment looks at the potential impacts of environmental change on the Offshore Project, rather than impacts of the Offshore Project on the environment. As such the receptor is the Offshore Project.

Baseline environment

5.3.1.3 According to the latest State of the UK Climate Report, the UK's climate is changing, with recent decades warmer, wetter, and sunnier than the 20th century on a national and local scale. The Climate Resilience assessment considers the current baseline of climate variables (1991 – 2020) and the future baseline, which utilises the Climate Risk Indicators (CRI) tool, which considers the UK Climate Projections 2018 (UKCP18) across the Offshore Project lifetime, at the local authority level of the Western Isles/*Na h-Eileanan*.

Embedded environmental measures

5.3.1.4 A range of environmental measures relevant to climate resilience are embedded as part of the Offshore Project to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the climate resilience assessment are:

- M019: A final Offshore Environmental Management Plan (OEMP) will be developed prior to commencement of construction (building on Outline Offshore EMP, Volume 3) in compliance with legislative requirements and/or best practice standards and guidance and adhered to.
- M020: A Decommissioning Plan will be developed prior to the construction of the Project in compliance with legislative requirements and/or best practice standards and guidance and adhered to.
- M025: A final Operational & Maintenance (O&M) Plan (building on Outline Operational & Maintenance Plan, Volume 3) will be developed in compliance with legislative requirements

and/or best practice standards and guidance prior to the operation of the Project and adhered to.

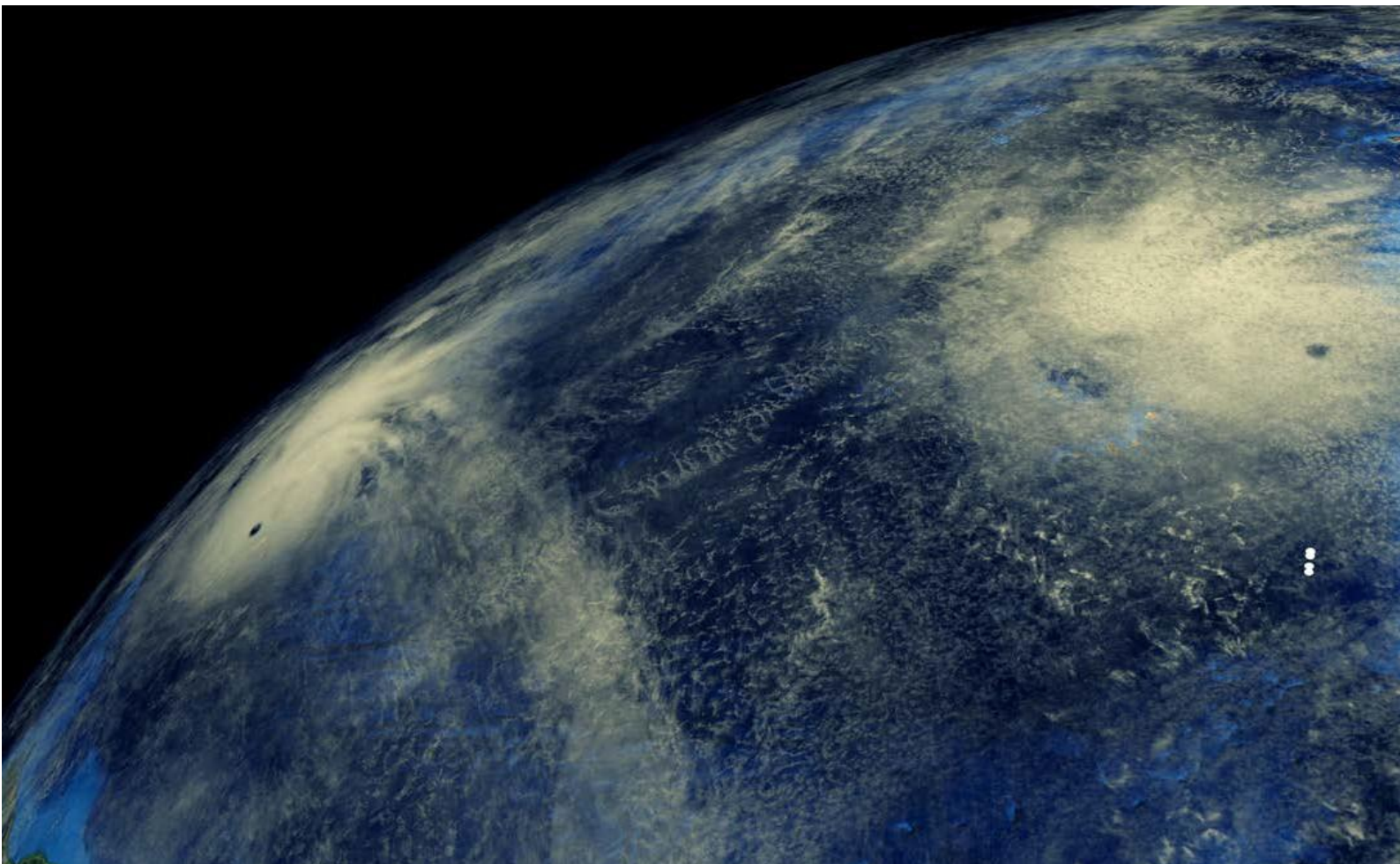
- M051: The Applicant will comply with the Construction Design and Management (CDM) regulations and complete design risk registers and undertake hazard identifications for all components of the Offshore Project.
- M052: A Service and Maintenance Agreement will be in place, key turbine metrics (vibration/temperature load sensors etc.) will be monitored as part of the Supervisory Control and Data Acquisition (SCADA) system during and after extreme weather events to determine if any aspect of the structural integrity could be or has been compromised.

Likely significant residual effects

5.3.1.5 The Climate Vulnerability Assessment identifies 3 hazards (high winds, ocean acidification and sea-level rise) of which the Offshore Project is a 'medium' sensitivity for and are therefore assessed within the Climate Resilience Assessment.

5.3.1.6 When the embedded environmental measures to prevent, control and limit the potential for effects on climate resilience during the lifetime of the Offshore Project are taken into account, **No Significant Effects** are identified in the Climate Resilience assessment, during the construction, operation and maintenance, and decommissioning phases of the Offshore Project.

5.3.1.7 As there are no receptors in common with other developments or environmental aspects, no assessment of cumulative or combined effects is undertaken. Similarly, no transboundary effects are anticipated on the basis that climate change adaptation effects and impacts are specific to the Offshore Project and will not result in impacts to an adjacent EEA state.



5.4 GREENHOUSE GASES

How effects on Greenhouse Gases have been assessed

5.4.1.1 Greenhouse Gases (GHG) include six categories of gases: carbon dioxide, methane, nitrous oxide, F-gases (hydrofluorocarbons and perfluorocarbons), sulphur hexafluoride and nitrogen trifluoride. The Greenhouse Gas assessment considers how the Offshore Project could release GHG during its construction, operation and maintenance and how these GHG releases could influence global warming and climate change.

5.4.1.2 The GHG assessment considers how the Offshore Project could release GHG through activities associated with all project phases (construction, operation and maintenance and decommissioning), including:

Construction and Decommissioning

- GHG released during the manufacturing of the materials needed to build the wind farm;
- GHG released during the transport of the materials to suppliers and to site;
- GHG released from the fuel used by ships, helicopters, and machinery.

Operation and Maintenance

- GHG released during the use of consumable materials such as oils used as lubricants for machinery, chemicals used for cooling machinery, and in fire suppressant systems.
- GHG released from the fuel used by ships, helicopters, and machinery during maintenance activities;
- GHG released through the use of operation and maintenance materials.

Baseline environment

5.4.1.3 To provide a context for GHG emissions arising from the Offshore Project, baseline data for local, regional and UK emissions was sourced from the UK local authority and regional greenhouse gas emissions statistics, 2005 to 2022. This specifies the GHG emission sources identified locally, nationally in Scotland/*Alba*, and across the UK.

5.4.1.4 Data to inform the GHG assessment has been provided by the Applicant in relation to the material types and quantities that are expected to be used. The GHG emissions that come from these (referred to as GHG Emission factors) were sourced from public and governmental data sources such as the Department for the Environment, Food and Rural Affairs (DEFRA), National Grid, and the Inventory of Carbon and Energy (ICE).

5.4.1.5 The existing baseline GHG emission sources include premises that are used by industry, businesses and homes that use electricity and gas, the use of fuel by the transport network (including roads, railways and other sources such as ships and aeroplanes), waste disposal, and agriculture.

5.4.1.6 The GHG emissions created by the Offshore Project can then be compared against the likely future baseline for the existing emission sources. This is established through the Carbon Budgets that have been developed by the UK Government for the periods 2028-2032 and 2033-2037.

Embedded environmental measures

5.4.1.7 A range of environmental measures that relate to GHG emissions are embedded as part of the Offshore Project design to reduce or minimise the potential magnitude of environmental effects as far as possible. The key measure for the GHG assessment is:

- M019: A final Offshore Environmental Management Plan (OEMP) will be developed prior to commencement of construction (building on **Outline Offshore EMP**, **Volume 3**) in compliance with legislative requirements and/or best practice standards and guidance and adhered to.

Likely significant residual effects

5.4.1.8 As a source of renewable power, the Offshore Project inherently generates low GHG emission electricity. The wind farm is estimated to have offset its lifecycle GHG emissions after approximately 30% of its operational lifetime, or around 128 months (~10 years). This is therefore a Beneficial (**Significant**) effect.

5.4.1.9 When the embedded environmental measures to prevent, control and limit the potential for effects on the global climate from GHG emissions during the lifetime of the Offshore Project are taken into account, there are **No Significant Effects** anticipated.

5.4.1.10 In line with IEMA guidance (IEMA, 2022), the GHG assessment is considered to be inherently cumulative, and no additional consideration of cumulative effects is required. Therefore, **No Significant** cumulative effects have been identified in relation to the Offshore Project from GHG emissions resulting from construction, operation and maintenance, and decommissioning activities.

5.4.1.11 **No Significant** effects as a result of the OTW Project of greater significance compared to the impacts considered alone were identified for GHG emissions from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.4.1.12 **No Significant** combined effects of greater significance compared to the impacts considered alone were identified for GHG emissions from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.4.1.13 **No Significant** transboundary effects have been identified in relation to the Offshore Project from GHG emissions from construction, operation and maintenance, and decommissioning activities.

5.5 PHYSICAL AND COASTAL PROCESSES

How effects on physical and coastal processes have been assessed

5.5.1.1 The physical and coastal processes assessment identifies the surrounding coastline, sub-tidal seabed and designated sites of geological interest as receptors within the Study Area. The Study Area captures the full extent of the Zone of Influence for this topic, which is defined by the theoretical path of a water particle area over one complete tidal cycle. This is referred to as a "spring tidal excursion ellipse" and is equal to an approximate 6 km offset from the Offshore Project Boundary. The assessment considers the effects associated with all project phases (construction, operation and maintenance and decommissioning), including:

Construction and Decommissioning

- Sediment disturbance and seabed change from the installation of WTGs and Offshore Cables, and Horizontal Directional Drilling (HDD) activities

Operation and Maintenance

- Changes in water depth, current speed, waves due to the physical presence of Offshore Project infrastructure
- Changes to stratification due to the physical presence of Offshore Project infrastructure
- Scour resulting from the physical presence of Offshore Project infrastructure

5.5.1.2 To understand the impacts the Offshore Project is anticipated to have on receptors within the Study Area, modelling was undertaken to demonstrate how baseline conditions may change due to impacts from the construction and operational phases. This modelling is taken forward into other technical topic assessments, such as benthic ecology.

Baseline environment

5.5.1.3 The physical and coastal processes assessment provides the current baseline conditions within the Study Area for bathymetry, geology, water levels, waves, tidal currents, stratification, seabed sediments and sediment transport pathways.

5.5.1.4 Baseline data to inform the physical and coastal processes assessment has been gathered from a range of desk-based data sources and information gathered in a series of site surveys, including subtidal environmental characterisation, wind and metocean monitoring (including wave buoys) and bathymetric surveys.

5.5.1.5 Rock outcrops are present along the coast and extend across the Offshore Cable Area of Search and into the southeast of the Array Area. The seabed is a mix of rocks and coarse sand or gravel, with some areas having more hard rock and others more loose material.

5.5.1.6 The area experiences regular tides, with the water rising and falling about 4.5 metres between the highest and lowest points each day. Water currents (the movement of water) are moderate and

predictable, with stronger flows during spring tides. Waves mostly come from the west and can be quite high, especially in winter storms. The average wave height is about 2.3m.

5.5.1.7 The seawater is usually well-mixed from top to bottom, with only small differences in temperature between the surface and the seabed. This means there is stratification and the water is not strongly separated into warm and cold layers.

5.5.1.8 Most of the seabed is made up of coarse sand and gravel, which is not easily disturbed and mobilised into the water column by waves and currents during normal conditions. Finer materials like silt and sand can be moved by waves and currents, especially during storms, but overall, the water is usually clear with low levels of suspended sediments.

5.5.1.9 The coastline near the project is relatively stable and is not expected to erode significantly, even in future climate change scenarios. This stability reflects the predominantly rocky coastline. Any risk of erosion is likely due to natural forces like waves and storms rather than Project-related activities.

Embedded environmental measures

5.5.1.10 A range of environmental measures that relate to physical and coastal processes impacts are embedded as part of the Offshore Project to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the physical and coastal processes assessment are:

- M001: The outputs of the project-specific site investigation surveys will be reviewed to ensure that the final design and location of key project infrastructure takes full account of the physical environment and considers the potential for long-term changes. The mitigation hierarchy will be applied to avoid any sensitive areas identified, as far as is possible, by micrositing wind turbine generators and cables.
- M002: A Cable Installation Plan will be produced to confirm routing, method of installation and aspects such as target Depth of Burial and need for/location of/type of external cable protection. This Plan will also contain the outputs of a formal Cable Burial Risk Assessment (CBRA). Data from the project-specific geophysical surveys will be used to identify the preferred route, with the use of natural crevasses or channels within the bedrock proposed, where feasible, and areas of thicker Quaternary sediments identified (to maximise opportunities for cable burial).

Likely significant residual effects

5.5.1.11 When the embedded environmental measures to prevent, control and limit the potential for effects on receptors from physical and coastal processes during the lifetime of the Offshore Project are taken into account, there are **No Significant Effects** anticipated.

5.5.1.12 **No Significant** cumulative effects have been identified in relation to the Offshore Project on physical and coastal processes from construction, operation and maintenance, and decommissioning activities.

5.5.1.13 **No Significant** effects as a result of the OTW Project of greater significance compared to the impacts considered alone were identified for physical and coastal processes receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.5.1.14 **No Significant** combined effects of greater significance compared to the impacts considered alone were identified for physical and coastal processes receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.5.1.15 **No Significant** transboundary effects have been identified in relation to the Offshore Project on physical and coastal processes from construction, operation and maintenance, and decommissioning activities.

5.6 MARINE SEDIMENT AND WATER QUALITY

How effects on marine sediment and water quality have been assessed

5.6.1.1 The marine sediment and water quality assessment identifies marine sediment quality, marine water quality and blue carbon (carbon naturally captured and stored by coastal and marine ecosystems) as receptors within the Study Area. The Study Area is a 6km "spring tidal excursion ellipse", which captures the full extent of the Zone of Influence for this topic, around the Offshore Project Boundary. The chapter applies the modelling provided in **Chapter 9: Physical and Coastal Processes**, **Volume 2a** (see paragraph 5.5.1.2), to marine sediment and water quality impact pathways, to inform assessment. The assessment considers effects associated with all project phases (construction, operation and maintenance and decommissioning), including:

All phases

- Seabed disturbance from project activities (Wind Turbine Generator or Offshore Cables installation) temporarily increasing suspended sediment and resettlement to the seabed. This may result in increased suspended solids concentration in the water column and thus represent a deterioration of water quality in offshore and inshore waters. It may also result in potential changes in the quality of sediment in areas where resettlement occurs.
- Seabed disturbance from project activities resulting in increased concentration of sediment-associated contaminants, causing deterioration of water quality in offshore and inshore waters.
- Potential changes in water quality where drilling mud is mobilised during Horizontal Directional Drilling activities, and in sediment quality on settlement.
- Disturbance of blue carbon resources (within sediment) from project activities.

Baseline environment

5.6.1.2 The marine sediment and water quality assessment provides the current baseline conditions for the physical, chemical and biological parameters of water quality, the physical and chemical parameters of marine sediment quality, and the status of blue carbon resource within the Study Area.

5.6.1.3 Data to inform the marine sediment and water quality assessment has been gathered from a range of desk-based data sources and information gathered in a series of site surveys, including subtidal environmental characterisation.

5.6.1.4 Total suspended sediment concentrations within the Offshore Project Boundary are considered to be low, compared to average concentrations in the North Sea. The water quality of the sea around the Isle of Lewis/*Eilean Leòdhais* is generally excellent, due to the limited land-based influence with low urbanisation and limited industrial and farming development, coupled with a highly energetic marine.

5.6.1.5 The baseline environment for sediment is described at broad scale across the Study Area, as featuring predominantly cobbles and mobile, course sediments, with stony features. The Area

within the OCAS and along the southeast boundary of the Array Area, is characterised predominantly by exposed bedrock.

5.6.1.6 Levels of heavy and trace metals in sediments within the Study Area are below relevant threshold levels (Action Level 2) as defined by CEFAS guidance, with all but 1 metals (Nickel) also being under the lower Action Level 1. Similarly, hydrocarbon concentrations across the Study Area are concluded to be of no concern.

5.6.1.7 Due to the predominant sediment types across the Study Area (sand and rock), the potential for blue carbon resource within sediments is considered to be moderate to low.

5.6.1.8 The southwest extent of the Offshore Project Boundary is located within the Water Framework Directive (WFD) designated coastal waterbody Gallan Head/*Àird Uig* to Butt of Lewis/*Rubha Robhanais*, ID 200476, which has a Water Classification Status of 'High', indicating it is unpolluted and maintains near-natural characteristics. Also, the WFD designated site of Loch Roag/*Loch Ròg*, ID 200205 is located approximately 5 km southwest of the Offshore Project Boundary and has a Water Classification Status of 'Good', thus a moderate/good ecological status, supporting a diverse community of species.

5.6.1.9 The marine sediment and water quality assessment considers climate change as the primary driver of future baseline conditions over the Project lifetime, including predicted sea level rise, sea temperature and salinity changes, and extremes of weather. In line with relevant guidance, conservative climate projections are considered from UKCP18.

Embedded environmental measures

5.6.1.10 A range of environmental measures that relate to marine sediment and water quality impacts are embedded as part of the Offshore Project to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the marine sediment and water quality assessment are:

- M001: The outputs of the project-specific site investigation surveys will be reviewed to ensure that the final design and location of key project infrastructure takes full account of the physical environment and considers the potential for long-term changes. The mitigation hierarchy will be applied to avoid any sensitive areas identified, as far as is possible, by micrositing wind turbine generators (WTG) and cables.
- M002: A Cable Installation Plan will be produced to confirm routing, method of installation and aspects such as target Depth of Burial and need for/location of/type of external cable protection. This Plan will also contain the outputs of a formal Cable Burial Risk Assessment (CBRA). Data from the project-specific geophysical surveys will be used to identify the preferred route, with the use of natural crevasses or channels within the bedrock proposed, where feasible, and areas of thicker Quaternary sediments identified (to maximise opportunities for cable burial).

- M005: Relevant best practice techniques for seabed excavations, employed through all phases of the Project, and suspended solids monitoring to aid responsible management of excavation activities.

Likely significant residual effects

5.6.1.11 When the embedded environmental measures to prevent, control and limit the potential for effects on marine sediment and water quality during the lifetime of the Offshore Project are taken into account, there are **No Significant Effects** anticipated.

5.6.1.12 **No Significant** effects as a result of the OTW Project of greater significance compared to the impacts considered alone were identified for marine sediment and water quality receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.6.1.13 **No Significant** cumulative effects have been identified in relation to the Offshore Project on marine sediment and water quality from construction, operation and maintenance, and decommissioning activities.

5.6.1.14 **No Significant** combined effects of greater significance compared to the impacts considered alone were identified for marine sediment and water quality receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.6.1.15 **No Significant** transboundary effects have been identified in relation to the Offshore Project on marine sediment and water quality from construction, operation and maintenance, and decommissioning activities.

5.7 BENTHIC AND INTERTIDAL ECOLOGY

How effects on benthic and intertidal ecology have been assessed

5.7.1.1 The benthic and intertidal ecology assessment identifies benthic ecology (habitats and organism on or in the seabed), shellfish ecology and blue carbon (carbon naturally captured and stored by coastal and marine ecosystems) as receptors within the Study Area (incorporating 6km around the Offshore Project Boundary to cover the spring tidal ellipse), and considers the effects associated with all project phases (construction, operation and maintenance and decommissioning), including:

Construction and Decommissioning

- Temporary disturbance to habitat from project activities which interact with the seabed, such as Wind Turbine Generator and Cable installation;
- Removal of hard structures following decommissioning of the Offshore Project;
- Disturbance from underwater acoustic noise and vibration sources, such as vessel movements and percussive piling;
- Protection of benthic habitats from fishing restrictions.

Operation and Maintenance

- Long-term loss of habitat from the physical presence of infrastructure associated with the Offshore Project;
- Long-term habitat disturbance from repeated maintenance activities in specific locations;
- Electro-Magnetic Field (EMF) effects from subsea electrical cables;
- Thermal emissions from subsea electric cables.

All phases

- Introduction and colonisation of infrastructure by Invasive Non-Native Species (INNS)
- Trenchless crossing techniques (such as HDD) employed at the cable landfall location, resulting in release of drilling fluid mud, drilling arisings or bentonite
- Temporary increase in suspended sediment concentration and turbidity from project activities
- Increase in sediment deposition as a result of sediment mobilised by project activities

Baseline environment

5.7.1.2 The benthic and intertidal assessment provides the current baseline conditions for benthic and intertidal habitats and the species which inhabit them, within the Study Area.

5.7.1.3 Data to inform the benthic and intertidal ecology assessment has been gathered from a range of desk-based data sources and information gathered in a series of site surveys, including subtidal environmental characterisation.

5.7.1.4 The seabed across the Study Area is characterised by a range of substrata, including boulders and cobbles, pebbles and shingle, coarse sands, sands, fine sands, muds and mixed sediments and

associated benthic and intertidal communities, such as mussels, barnacles, anemones, starfish and crabs, as well as annex I bedrock/stoney reef (as Designated under the Habitats Directive) and other priority marine features including kelp beds, tide-swept algal communities and offshore subtidal sands and gravels.

5.7.1.5 The nearest site designated for qualifying features which are relevant to Benthic and Intertidal Ecology is Loch Roag Lagoons SAC, located approximately 6.8 km southwest of the Study Area. The Loch Roag SAC is designated for its Coastal lagoons, which are a priority marine feature, defined by its complex environment of fully marine (salt) water, interacting with freshwater from small inlet streams. The Lagoons provide habitat for a range of species.

Embedded environmental measures

5.7.1.6 A range of environmental measures that relate to benthic and intertidal ecology impacts are embedded as part of the Offshore Project to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the benthic and intertidal ecology assessment are:

- M005: Relevant best practice techniques for seabed excavations, employed through all phases of the Project, and suspended solids monitoring to aid responsible management of excavation activities.
- M054: To limit physical disturbance to the seabed, vessels will minimise the use of anchors, prioritising the use of dynamic positioning, where possible. This protocol will be of particular consideration around sensitive habitats.

Likely significant residual effects

5.7.1.7 When the embedded environmental measures to prevent, control and limit the potential for effects on marine sediment and water quality during the lifetime of the Offshore Project are taken into account, there are **No Significant Effects** anticipated.

5.7.1.8 **No Significant** effects as a result of the OTW Project of greater significance compared to the impacts considered alone were identified for benthic and intertidal ecology receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.7.1.9 **No Significant** cumulative effects have been identified in relation to the Offshore Project on benthic and intertidal ecology from construction, operation and maintenance, and decommissioning activities.

5.7.1.10 **No Significant** combined effects of greater significance compared to the impacts considered alone were identified for benthic and intertidal ecology receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.7.1.11 **No Significant** transboundary effects have been identified in relation to the Offshore Project on benthic and intertidal ecology from construction, operation and maintenance, and decommissioning activities.

5.8 FISH ECOLOGY

How effects on fish ecology have been assessed

5.8.1.1 The fish ecology assessment considers marine and diadromous fish, and freshwater pearl mussels as receptor groups, within the Study Area. Marine species are those which live only in the ocean and diadromous fish are those species which have life stages in both freshwater and seawater environments. Freshwater pearl mussels rely on diadromous fish species to support a stage in their lifecycle. The assessment considers the effects associated with all project phases (construction operation and maintenance and decommissioning), including:

Construction

- Temporary seabed habitat loss and/or disturbance during construction due to seabed preparation activities and the installation of temporary foundations;
- Increases in suspended sediment concentration and associated sediment deposition resulting from construction activities interacting with the seabed and the release of drilling muds during Horizontal Directional Drilling at the Landfall;
- Underwater noise and vibration from percussive piling, as well as continuous noise from vessel operations.

Operation and Maintenance

- Permanent seabed habitat loss/disturbance from the presence of permanent infrastructure and associated maintenance activities;
- Increases in suspended sediment concentration and associated sediment deposition resulting from maintenance activities interacting with the seabed;
- Continuous underwater noise and vibration from wind turbine generators and vessel operations;
- Electromagnetic Field generated through the subsea electrical cabling;
- Aggregation (of marine species) effects due to the presence of infrastructure in the water column and on the seabed.

Decommissioning

- Temporary seabed habitat loss and/or disturbance during decommissioning due to seabed preparation activities and the installation of temporary foundations;
- Increases in suspended sediment concentration and associated sediment deposition resulting from decommissioning activities interacting with the seabed.

Baseline environment

5.8.1.2 Data to inform the marine ecology assessment has been gathered from a range of desk-based data sources and information gathered in a series of site surveys.

5.8.1.3 Numerous marine fish species were recorded within the Marine Fish Study Area, including 10 pelagic species, fish which live in open water (such as Atlantic mackerel), 74 demersal species, fish which live near or on the seabed (such as Atlantic cod), and 22 elasmobranch species, a group of fish which includes sharks, rays and skates, with potential spawning and nursery grounds for particular species also identified.

5.8.1.4 For diadromous fish, based on the review of desktop sources and site surveys, it is expected that Atlantic salmon, Sea trout *Salmo trutta,* and European eel may be present within the Diadromous Fish Study Area. Atlantic salmon travel from their early life stages in the Loch Roag salmon fishery district, which includes rivers such as the River Barvat, River Carloway, Langavat SAC and River Blackwater, which are on the west coast of the Isle of Lewis, to coastal waters as juveniles, prior to long distance migrations between feeding grounds in the Norwegian Sea and west Greenland and back to natal rivers as adults for spawning.

Embedded environmental measures

5.8.1.5 A range of environmental measures that relate to fish ecology impacts are embedded as part of the Offshore Project to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the fish ecology assessment are:

- M001: The outputs of the project-specific site investigation surveys will be reviewed to ensure that the final design and location of key project infrastructure takes full account of the physical environment and considers the potential for long-term changes. The mitigation hierarchy will be applied to avoid any sensitive areas identified, as far as is possible, by micrositing wind turbine generators (WTG) and cables.
- M006: A final Invasive Non-Native Species (INNS) Management Plan will be developed prior to commencement of construction (building on the **INNS Management Plan**, **Volume 3**) in compliance with legislative requirements and/or best practice standards and guidance and adhered to.
- M023: Offshore construction within the Turbine Area will only be undertaken during the April–October period, except for offshore Landfall construction works located within the HDD Exit Pit Area.

Additional environmental measures

5.8.1.6 Additional environmental measures have been developed to provide secondary mitigation in instances where likely significant effects have been concluded:

A006: The Piling Strategy will be developed to incorporate the percussive piling installation sequencing and periods of continuous quiet time as outlined in **Appendix 12.3: Overview of Percussive Piling Fish Ecology Mitigation**, **Volume 2c**.

Likely significant residual effects

5.8.1.7 When the embedded environmental and additional measures to prevent, control and limit the potential for effects on fish ecology during the lifetime of the Offshore Project are taken into account, there are **No Significant Effects** anticipated.

5.8.1.8 **No Significant** cumulative effects have been identified in relation to the Offshore Project on fish ecology from construction, operation and maintenance, and decommissioning activities.

5.8.1.9 **No Significant** effects as a result of the OTW Project of greater significance compared to the impacts considered alone were identified for fish ecology receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.8.1.10 **No Significant** combined effects of greater significance compared to the impacts considered alone were identified for on fish ecology receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.8.1.11 **No Significant** transboundary effects have been identified in relation to the Offshore Project on fish ecology from construction, operation and maintenance, and decommissioning activities.

5.9 MARINE MAMMALS

How effects on marine mammals have been assessed

5.9.1.1 The marine mammals assessment considers cetaceans (toothed whales and baleen whales) and pinnipeds (seals) as receptors, within the Study Area, which is composed of the Array Area plus a 100 km buffer. For underwater noise impact pathways, which cover a greater extent, the assessment uses defined Marine Mammal Management Units and Seal Monitoring Units, which are mapped areas to show where specific species of marine mammals and seals live and move in. The assessment considers the effects associated with all project phases, (construction, operation and maintenance and decommissioning) including:

Construction and Decommissioning

- Auditory injury from percussive piling noise;
- Disturbance from percussive piling noise;
- Auditory injury from other construction (and decommissioning) noise;
- Disturbance from other construction (and decommissioning) noise;
- Disturbance or temporary habitat loss from presence of vessels.

Operation and maintenance

- Disturbance from wind turbine generator noise;
- Disturbance from other operational noise;
- Barrier effects from the presence of physical infrastructure and maintenance works;
- Long-term changes in habitat and foraging opportunities from the presence of physical infrastructure.

All phases

- Vessel collision;
- Accidental release of pollutants from vessels;
- Increases in suspended sediment concentration and reduction in water quality as a result of project activities which interact with the seabed;
- Indirect effects of impacts on prey availability due to impacts from project activities.

Baseline environment

5.9.1.2 Data to inform the marine mammal current baseline has been gathered from a range of desk-based data sources and information gathered in a series of site surveys.

5.9.1.3 The west coast of Scotland/Alba is a globally important region for cetaceans with 24 species being recorded within Hebridean waters, 15 of these being recorded annually. The most frequently observed cetacean species off the coast of northwest Lewis/*Leòdhais* include harbour porpoise,

white-beaked dolphin, common dolphin, common bottlenose dolphin, Risso's dolphin, and minke whale.

5.9.1.4 There are 2 resident species of pinniped in Scotland/*Alba*, the harbour seal and the grey seal. Both species are present throughout the Outer Hebrides/*Na h-Eileanan Sia*, including the northwest coast of the Isle of Lewis/*Eilean Leòdhais*. Grey seals are present in higher numbers than harbour seal throughout the Western Isles Seal Management Unit (SMU).

Embedded environmental measures

5.9.1.5 A range of environmental measures that relate to marine mammals impacts are embedded as part of the Offshore Project to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the marine mammals assessment are:

- M003: A final Marine Mammal Mitigation Protocol (MMMP) will be developed prior to commencement of construction (building on the **Outline MMMP**, **Volume 3**) in compliance with legislative requirements and/or best practice standards and guidance and adhered to.
- M022: A final Navigational Safety and Vessel Management Plan (NSVMP) will be developed prior to commencement of construction (building on the Outline NSVMP, Volume 3) in compliance with legislative requirements and/or best practice standards and guidance and adhered to.
- M031: A Marine Pollution Contingency Plan (MPCP) will be developed prior to commencement of construction (building on Outline MPCP, Volume 3) in compliance with legislative requirements and/or best practice standards and guidance and adhered to.

Likely significant residual effects

5.9.1.6 When the embedded environmental measures to prevent, control and limit the potential for effects on marine mammals during the lifetime of the Offshore Project are taken into account, there are **No Significant Effects** anticipated. No additional mitigation measures were required as part of the marine mammals assessment.

5.9.1.7 **No Significant** effects as a result of the OTW Project of greater significance compared to the impacts considered alone were identified for marine mammals receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.9.1.8 **No Significant** cumulative effects have been identified in relation to the Offshore Project on marine mammals from construction, operation and maintenance, and decommissioning activities.

5.9.1.9 **No Significant** combined effects of greater significance compared to the impacts considered alone were identified for on marine mammals receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.9.1.10 **No Significant** transboundary effects have been identified in relation to the Offshore Project on marine mammals from construction, operation and maintenance, and decommissioning activities.

5.10 MARINE AND NEARSHORE ORNITHOLOGY

How effects on marine and nearshore ornithology have been assessed

5.10.1.1 The marine and nearshore ornithology assessment considers impacts to birds, including species that spend time at sea and along the coast of the Isle of Lewis/*Eilean Leòdhais*. As birds are very mobile and often fly long distances in search of food, the EIAR has used a large Study Area to identify bird species that could be affected by the project. This has included areas where project infrastructure will be built, and it also includes wider regional areas to allow for the foraging ranges of important species.

5.10.1.2 The types of effect that birds could experience relate to all project phases (construction, operation and maintenance and decommissioning) as follows:

Construction and Decommissioning

- Temporary habitat loss and disturbance from activities such as seabed preparation, drilling, and Array Cable installation or removal (at decommissioning). These activities can disturb foraging, diving, and nesting and can make birds fly longer distances as a result.
- Changes to the availability of prey species as a result of construction and decommissioning activities.
- Some birds can be disturbed by the artificial lighting that is needed for safety on construction vessels. This can cause them to use energy unnecessarily.

Operation and Maintenance

- A risk that flying or diving birds could collide with the turning blades of the wind turbines, causing injury or death.
- Changes to the distribution of birds as a result of the presence of the Offshore Project. This is called displacement and it can prevent birds from accessing foraging areas, or roosting and nesting areas.
- Avoidance of the Turbine Area by birds that are migrating or in flight between important locations like feeding grounds and nesting areas. This can cause birds to fly further, which uses more energy.
- Long-term habitat loss as a result of the presence of the Offshore Project and the noise it creates, which can reduce the amount of locations suitable for foraging, nesting and roosting.
- As noted for construction and decommissioning, some birds can be disturbed by the artificial lighting that is needed for safety on maintenance vessels and also by the navigational and aviation safety lights the wind turbines.

Baseline environment

5.10.1.3 The bird species identified as occurring in the Study Area and having some degree of vulnerability to the potential effects of the Offshore Project are:

- Black legged kittiwake
- Great black-backed gull
- Herring gull
- Arctic tern
- Black guillemot
- Guillemot
- Razorbill
- Atlantic puffin
- Red-throated diver
- Great northern diver
- Northern fulmar
- Manx shearwater
- Northern gannet

5.10.1.4 The number of birds in and around the Isle of Lewis/*Eilean Leòdhais* depends on the season. The season also influences bird behaviour, with some species coming to the region to breed and nest in certain months, while other species come to the region to rest in the winter months. Some species are present in Scotland all year round, while others simply migrate through, stopping only to rest and feed. All of this variability between species is accounted for in the EIAR, to determine how the different species could be affected by the timing and location of activities for the Offshore Project as well as in relation to what they can be expected to be doing at the time.

5.10.1.5 The seasonal definitions for each species were agreed with NatureScot during the stakeholder engagement process. This ensures that the way in which the bird data has been analysed is aligned with the expectations of NatureScot as a key stakeholder and advisor to the Scottish Ministers.

5.10.1.6 The baseline population sizes and the natural mortality rates for birds in varying age classes is also defined in the EIAR. This is so that any impacts from the Offshore Project can be assessed in the context of the natural life cycle of the species in question. The impact of avian flu was also considered where relevant as this has impacted bird populations in Scotland in recent years.

5.10.1.7 Scotland and the Western Isles have many Special Protection Areas that are designated for birds species that are relevant to the assessment. The EIAR documents these and their distances from the Offshore Project. The Report to Inform Appropriate Assessment provides more detail on how the Offshore Project could affect the designated features of these SPAs through the lens of the Habitats Regulations.

5.10.1.8 The future baseline for birds on the Isle of Lewis/*Eilean Leòdhais will* be influenced by factors including invasive species, commercial fisheries bycatch where birds and their prey species are

accidentally killed by fishing activities, and climate change. Changes in fisheries management practices may also influence the future distribution of bird species as this can influence the availability of prey species and wider food sources for scavengers. Seabird populations are currently showing a declining trend, which can be expected to continue as a result of the factors described.

Embedded environmental measures

5.10.1.9 A range of environmental measures that relate to marine and nearshore ornithology are embedded as part of the Offshore Project to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the marine and nearshore ornithology assessment are:

- M005: Relevant best practice techniques for seabed excavations, employed through all phases of the Project, and suspended solids monitoring to aid responsible management of excavation activities.
- M016: Wind turbines blade clearance of at least 28.33 m above Mean High Water Springs (MHWS) (30 m above Mean Sea Level (MSL)).
- M033: A Lighting and Marking Plan (LMP) will be developed prior to commencement of construction (building on the Outline LMP, Volume 3) in compliance with legislative requirements and best practice standards and guidance and adhered to.

Likely significant residual effects

5.10.1.10 When the embedded environmental measures to prevent, control and limit the potential for effects on marine and nearshore ornithology during the lifetime of the Offshore Project are taken into account, there are **No Significant Effects** anticipated. No additional mitigation measures were required as part of the marine and nearshore ornithology assessment.

5.10.1.11 **No Significant** effects, as a result of the OTW Project, of greater significance compared to the impacts considered alone were identified for marine and nearshore ornithology receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.10.1.12 **No Significant** cumulative effects have been identified in relation to the Offshore Project on marine and **nearshore** ornithology receptors from construction, operation and maintenance, and decommissioning activities.

5.10.1.13 **No Significant** combined effects of greater significance compared to the impacts considered alone were identified for marine and nearshore ornithology receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.10.1.14 **No Significant** transboundary effects have been identified in relation to the Offshore Project on marine **and** nearshore ornithology from construction, operation and maintenance, and decommissioning activities.

5.11 OFFSHORE ARCHAEOLOGY AND CULTURAL HERITAGE

How effects on offshore archaeology and cultural heritage have been assessed

5.11.1.1 The offshore archaeology and cultural heritage chapter consists of:

- Offshore archaeology and cultural heritage assessment, that considers designated heritage assets such as protected wrecks and non-designated heritage assets, which are defined as features and deposits of archaeological interest, as groups of receptors within the Marine Archaeology Study Area.
- Onshore cultural heritage asset settings assessment, that considers the impacts of the Offshore Project on the settings of onshore archaeology and cultural heritage assets and the perception of the historic seascape from them.

5.11.1.2 The assessment considers the relevant effects associated with all project phases (construction, operation and maintenance and decommissioning), including:

Construction

- Direct impacts, from the installation activities (such as drilling or seabed preparation);
- Indirect impacts from the installation activities (such as vibration or an increase in suspended sediment from drilling piles).

Operation and maintenance

- Direct impact from maintenance activities (such as cable protection replacement);
- Indirect impacts from operation and maintenance activities (such as burial of heritage assets);
- Indirect impacts that affect the setting of designated and significant non-designated Onshore Archaeology and Cultural Heritage assets as a result of Offshore Project infrastructure.

Decommissioning

- Direct impacts, from the decommissioning activities (such as drilling or seabed preparation);
- Indirect impacts from the decommissioning activities (such as vibration or an increase in suspended sediment from drilling piles).

Baseline environment

5.11.1.3 The marine archaeology and cultural heritage assessment considers the historic character of the seabed, with analysis of potential features with archaeological potential.

5.11.1.4 The marine archaeology and cultural heritage assessment identified 45 non-designated assets within the Marine Archaeology Study Area and 1 non-designated asset within the Offshore Project Boundary. The single non-designated asset within the Offshore Project Boundary is a wreck record for the *Maju* (Canmore ID 217551), which is a mid-19th century iron ship, that wrecked in 1874 while carrying a cargo of coal. There are no designated heritage assets located within the Offshore Project Boundary.

5.11.1.5 With respect to the onshore cultural heritage asset settings assessment, there are 38 scheduled monuments, 5 listed buildings and 3 non-designated heritage assets that are considered. The scheduled monuments include prehistoric burial cairns, stone circles, including the complex at Callanish/*Calanais*, standing stones and settlements and brochs or duns.

Embedded environmental measures

5.11.1.6 A range of environmental measures that relate to offshore archaeology and cultural heritage impacts are embedded as part of the Offshore Project to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the offshore archaeology and cultural heritage assessment are:

- M007: A Written Scheme of Investigation (WSI) and Protocol for Archaeological Discoveries (PAD) will be developed prior to commencement of construction (building on **Written Scheme of Investigation** and **Protocol for Archaeological Discoveries**, **Volume 3**) in compliance with legislative requirements and/or best practice standards and guidance and adhered to.
- M008: Archaeological Exclusion Zones (AEZs), Temporary Exclusion Zones (TEZs) or Areas of Archaeological Interest (AAI) and micrositing will be developed prior to the construction of the Offshore Project in accordance with legislative requirements and/or best practice guidance, to avoid sites of known archaeological significance.

Likely significant residual effects

5.11.1.7 Despite the application of appropriate embedded measures, the potential for a **Significant effect** to occur during the construction phase of the Offshore Project remains, should direct impact be made to a previously unknown archaeological remains.

5.11.1.8 **Significant effects** are also anticipated to the setting of designated onshore archaeology and cultural heritage assets of Teampull Eoin, chapel, graveyard and settlement, Port Mhór Bragar and Dun Borve, broch, as a result of the change of views to the seascape due to the construction and operation of the Offshore Project.

5.11.1.9 **No Significant** effects as a result of the OTW Project of greater significance compared to the impacts considered alone were identified for offshore archaeology and cultural heritage or onshore cultural heritage asset settings assessment receptors, from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.11.1.10 **No Significant** cumulative effects have been identified in relation to the Offshore Project on offshore archaeology and cultural heritage receptors from construction, operation and maintenance, and decommissioning activities.

5.11.1.11 **No Significant** combined effects of greater significance compared to the impacts considered alone were identified for offshore archaeology and cultural heritage receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.11.1.12 **No Significant** transboundary effects have been identified in relation to the Offshore Project on offshore archaeology and cultural heritage from construction, operation and maintenance, and decommissioning activities.

5.12 SHIPPING AND NAVIGATION

How effects on shipping and navigation have been assessed

5.12.1.1 The shipping and navigation assessment considers commercial vessels, such as cargo vessels, commercial fishing vessels, recreational vessels, military vessels, port related services and emergency responders, such as the Royal National Lifeboat Institution, as groups of receptors within the Shipping and Navigation Study Area. The Shipping and Navigation Study Area is comprised of the Offshore Project Boundary, plus a buffer of 10 nautical miles. The assessment considers the relevant effects associated with all project phases (construction, operation and maintenance and decommissioning), including:

All phases

- Vessel displacement by the Offshore Project
- Increased collision risk between third-party vessels
- Collision risk between a third-party vessel and an Offshore Project vessel
- Reduced access to local ports, harbours and facilities

Operation and Maintenance only

- Allision risk between a vessel and the Offshore Project
- Reduction in under keel clearance
- Vessel interaction with subsea cables
- Reduction in emergency response capability

Baseline environment

5.12.1.2 A number of shipping and navigational areas and activities are identified within the vicinity of the Offshore Project, most prominently is the Loch Roag area, which is located approximately 1.9 nautical miles at its closest point southeast of the Array Area. The Loch Roag area features Aids to Navigation, such as the Aird Laimishader lighthouse, aquaculture sites, and several small fishing and recreational harbours. The closest commercial port is Stornoway/*Steòrnabhagh* Harbour, on the east coast of the Isle of Lewis/*Eilean Leòdhais*.

5.12.1.3 Vessel transit data was collected in support of the assessment during 2024. During the winter period, there was an average of 5-6 unique vessels per day recorded within the Shipping and Navigation study area, and an average of 1 per day recorded within the Array Area itself and the Offshore Cable Area of Search. During the summer period, this figure rose to an average of between 7-8 unique vessels per day recorded within the Shipping and Navigation study area.

Embedded environmental measures

5.12.1.4 A range of environmental measures that related to shipping and navigation impacts are embedded as part of the Offshore Project to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the shipping and navigation assessment are:

- M012: Timely and efficient distribution of Notices to Mariners (NtMs), Kingfisher notifications, and other navigational warnings of the position and nature of works associated with the Offshore Project, including information for vessel routes, timings and locations, safety zones (around surface piercing infrastructure) and advisory passing distances. Physical notices will be placed at marinas and harbours in the vicinity of the Offshore Project and final locations of installed infrastructure will be charted and distributed to recreational clubs.
- M022: A final Navigational Safety and Vessel Management Plan (NSVMP) will be developed prior to commencement of construction (building on the Outline NSVMP, Volume 3) in compliance with legislative requirements and/or best practice standards and guidance and adhered to.
- M029: A Marine Coordination Centre will be established to monitor all vessel activity (Project, fishing and other maritime vessels), issue Notices to Mariners, and serve as a contact point for all maritime stakeholders.

Likely significant residual effects

5.12.1.5 When the embedded environmental measures to prevent, control and limit the potential for effects on shipping and navigation during the lifetime of the Offshore Project are taken into account, there are **No Significant Effects** anticipated. No additional mitigation measures were required as part of the shipping and navigation assessment.

5.12.1.6 **No Significant** effects as a result of the OTW Project of greater significance compared to the impacts considered alone were identified for shipping and navigation receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.12.1.7 **No Significant** cumulative effects have been identified in relation to the Offshore Project on shipping and navigation from construction, operation and maintenance, and decommissioning activities.

5.12.1.8 **No Significant** combined effects of greater significance compared to the impacts considered alone were identified for shipping and navigation receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.12.1.9 **No Significant** transboundary effects have been identified in relation to the Offshore Project on shipping and navigation from construction, operation and maintenance, and decommissioning activities.

5.13 MILITARY AND CIVIL AVIATION

How effects on military and civil aviation have been assessed

5.13.1.1 The military and civil aviation assessment considers effects on UK aviation and radar receptors including Civil Aerodromes, Military Activities, NATS Facilities, Meteorological Facilities, Other aviation activities, within the Military and Civil Aviation Study Area. The Military and Civil Aviation Study Area is comprised of the Offshore Project Boundary, plus a buffer of 60 nautical miles. The assessment considers the relevant effects associated with the construction, operation and maintenance and decommissioning phases, including:

Construction

- The creation of a new aviation obstacle environment due to the construction of the Wind Turbine Generators
- The construction of Wind Turbine Generators and other structures may involve the use of helicopters

Operation and Maintenance

- The creation of a new aviation obstacle environment due to the construction of the Wind Turbine Generators
- The Array Area will be populated with rotating Wind Turbine Generators
- Helicopters may be used to assist in the maintenance of Wind Turbine Generators and OSP.
- Vessel interaction with subsea cables
- Reduction in emergency response capability

Decommissioning

- Decommissioning of Wind Turbine Generators and other structures may involve tall cranes, vessels and helicopters

Baseline environment

5.13.1.2 The Array Area is within Scottish Flight Information Region (FIR), regulated by the UK Civil Aviation Authority (CAA). The airspace up to FL195 (about 19,500 ft AMSL) is Class G (uncontrolled), mainly used for low-level, visual flight operations. Above this, there is Class C controlled airspace (TRA 008A), primarily for military flying, and higher levels of controlled airspace above that.

5.13.1.3 The closest controlled airspace is Moray CTA 9, 34.1 km southwest, which is Class E and a Transponder Mandatory Zone. The nearest Air Traffic Service (ATS) route is Y906, 36 km southwest. There are no upper ATS routes directly above the Array Area.

5.13.1.4 The nearest civil airport to the Array Area is Stornoway/*Steòrnabhagh* Airport located 29.6 km to the southeast. Stornoway/*Steòrnabhagh* Airport has established Instrument Flight Procedures which lie coincidental with the Array Area. The closest NATS Primary Surveillance Radar (PSR) is at Tiree

208 km south), which does not have Radar Line of Sight (RLoS) to the Array Area. The nearest Secondary Surveillance Radar (SSR) is NATS Sandwick (29.2 km southeast), but the Array Area is outside its safeguarded zone.

5.13.1.5 The nearest Air-Ground-Air (AGA) communication facility is Forsnaval (14.3 km southwest). While outside the 10 km safeguarded zone, NATS has indicated potential for signal interference, and so was included in the assessment.

5.13.1.6 The Array Area is within Low Flying Area (LFA) 14 (daytime) and Night-Time LFA 1BW, requiring MOD consultation and specific lighting for night operations. RAF Lossiemouth (207 km east-southeast) is outside RLoS. The nearest military Air Defence Radar is RRH Benbecula/*Beinn nam Fadhla* (85.5 km south-southwest), which may have RLoS to some Wind Turbine Generators in the Array Area.

5.13.1.7 The nearest Search and Rescue (SAR) base is at Stornoway Airport. SAR operations are complex and routes are unpredictable. The Maritime and Coastguard Agency (MCA) sets requirements for wind farms regarding SAR.

5.13.1.8 The closest Met Office weather radar is Druim A'Starraig (35.5 km southeast). RLoS analysis shows that Wind Turbine Generators will not be within the critical elevation scan, and the Met Office has confirmed impacts are manageable. A proposed radar at Campar Mor (22 km east) is also not expected to be impacted.

Embedded environmental measures

5.13.1.9 A range of environmental measures that relate to military and civil aviation impacts are embedded as part of the Offshore Project to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the military and civil aviation assessment are:

- M010: Compliance with MGN 654 and its annexes including development and implementation of a Search and Rescue (SAR) Checklist, Emergency Response Cooperation Plan (ERCOP) and guard vessels as required by risk assessment.
- M014: Marking and lighting of the Array Area in agreement with Northern Lighthouse Board (NLB) and as per the requirements of International Association of Lighthouse Authorities (IALA) Recommendation O-139 (IALA, 2021a) and Guidance G1162 (IALA, 2021b). This will include a buoyed construction area.
- M025: A final Operational & Maintenance (O&M) Plan (building on Outline Operational & Maintenance Plan, Volume 3) will be developed in compliance with legislative requirements and/or best practice standards and guidance prior to the operation of the Project and adhered to.

Likely significant residual effects

5.13.1.10 When the embedded and additional environmental measures to prevent, control and limit the potential for effects on **Military** and Civil Aviation during the lifetime of the Offshore Project are taken into account, there are **No Significant Effects** anticipated.

5.13.1.11 **No Significant** effects as a result of the OTW Project of greater significance compared to the impacts considered alone were identified for military and civil aviation receptors from construction, operation and **maintenance**, and decommissioning activities of the Offshore Project.

5.13.1.12 **No Significant** cumulative effects have been identified in relation to the Offshore Project on military and civil **aviation** from construction, operation and maintenance, and decommissioning activities.

5.13.1.13 **No Significant** combined effects of greater significance compared to the impacts considered alone **were** identified for military and civil aviation receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.13.1.14 **No Significant** transboundary effects have been identified in relation to the Offshore Project on military and **civil** aviation from construction, operation and maintenance, and decommissioning activities.

5.14 SEASCAPE, LANDSCAPE AND VISUAL IMPACT ASSESSMENT

How effects on seascape, landscape and visual impact assessment have been assessed

5.14.1.1 The seascape, landscape and visual impact assessment (SLVIA) considers how local people, as well as visitors will be able to see the Offshore Project during all of its project phases (construction, operation and maintenance and decommissioning) from various viewpoints. This includes coastal settlements, roads, high points (elevated sites and locations) and coastal viewpoints, recreational cycling and walking routes, visitor attractions such as beaches, historic sites and nature reserves, and caravan and camping sites.

5.14.1.2 It also considers how the Offshore Project could impact the Regional Coastal Character, the Landscape Character, and any Landscape Planning Designations such as National Scenic Areas and Wild Land Areas (as designated through relevant legislation and NatureScot guidance).

5.14.1.3 Effects on seascape, landscape and visual receptors arise because the Offshore Project will be visible during daylight hours from some of the viewpoints identified. Construction activities and the subsequent presence of structures such as the Wind Turbine Generators and Offshore Substation Platform during the operation of the Offshore Project could be perceived to change the character and qualities of the seascape and landscape.

5.14.1.4 During hours of darkness, lighting on vessels and structures needed for navigational and aviation safety will also be visible from some areas of the coast, which may also affect those with views out to sea.

5.14.1.5 The effects identified during the construction phase are typically short-term and temporary, while those during the operation and maintenance stage are typically longer-term but reversible.

Baseline environment

5.14.1.6 Data to inform the SLVIA was sourced from publicly available information regarding landscape, the descriptions of Regional Coastal and Landscape Characters and landscape designations. Field surveys were also undertaken that involved day and night-time viewpoint photography across the Study Area to establish the baseline environment.

5.14.1.7 Detailed terrain models were used together with the photography to create wireline imagery. This enabled the presence of the Offshore Project to be visualised in relation to the existing environment. It also established the Zones of Theoretical Visibility, which are the places from where people would be able to see the Offshore Project.

5.14.1.8 The baseline environment for the SLVIA is established as "*the area in which the development may be visible*" (in line with GLVIA3, Landscape Institute and Institute for Environmental Management and Assessment, 2013). The Study Area therefore encompasses the Isle of Lewis/*Eilean Leòdhais*, the majority of the Isle of Harris/*Na Hearadh* and its surrounding seascape and islands, including

the Flannan Isles/*Na h-Eileanan Flannach*, off the northwest coast of Scotland/*Alba* and forming the northern most of the Outer Hebrides/*Na h-Eileanan Siar* (also referred to as the 'Western Isles').

5.14.1.9 There is great visual diversity across the SLVIA Study Area, with north Lewis/*Eilean Leòdhais* embodying a plateau of low-lying peatland extending southwards to bold, rugged hills in South Lewis/*Eilean Leòdhais* and North Harris/*Na Hearadh*. The sea has a strong influence as, from many viewpoints, there is often as much seascape visible as landscape.

5.14.1.10 The coastline nearest to the Turbine Area within the SLVIA Study Area is generally rural in character, predominated by the linear patterns of crofting and is strongly associated with the sea. There are numerous settlements along the coastline, including the crofting townships in Ness/*Nis* including Eoropie/*Eòrapaidh*, the Port of Ness/*Port Nis* and Cross/*Cros*, North and South Galson /*Gàbhsann bho Dheas*, Borve/*Borgh*, Shader/*Siadar an Rubha*, Barvas/*Barabhas*, Arnol/*Àrnoil*, Bragar/*Bhràdhagair*, Shawbost/*Siabost*) and Carloway/*Càrlabhagh*.

5.14.1.11 The coastal character of the SLVIA Study Area is defined at the national level as Type 13: Low Rocky Island Coasts. 17 Regional Coastal Character Areas are defined along the coastline and hinterland of the SLVIA Study **Area**, which identify a strong visual relationship with the sea and tidal waters and coastal landscapes.

5.14.1.12 Much of the SLVIA Study Area experiences very low levels of light radiance at night, particularly across uninhabited areas of moorland and hills. However, in some specific areas light sources during hours of **darkness** are identified as coming from houses, villages, and industrial and commercial locations. Lighting on onshore wind turbines and navigational safety lighting on buoys at sea can also be seen at night.

Embedded environmental measures

5.14.1.13 A range of environmental measures which relate to the SLVIA are embedded as part of the Offshore Project to reduce **or** minimise the potential magnitude of environmental effects as far as possible. Key measures for the SLVIA are:

- M014: Marking and lighting of the Array Area in agreement with Northern Lighthouse Board (NLB) and as per the requirements of International Association of Lighthouse Authorities (IALA) Recommendation O-139 (IALA, 2021a) and Guidance G1162 (IALA, 2021b). This will include a buoyed construction area.
- M033: A Lighting and Marking Plan (LMP) will be developed prior to commencement of construction (building on the Outline LMP, Volume 3) in compliance with legislative requirements and best practice standards and guidance and adhered to.
- M036: The Project will only install Wind Turbine Generators and Offshore Substation Platform (if required) above sea infrastructure within the Turbine Area.
- M040: Due regard will be given to landscape and visual design principles in the Design Specification Layout Plan post consent, with consideration of the seascape, landscape and visual impacts of the Offshore Project on the NSA.

Likely significant residual effects

5.14.1.14 Despite the application of appropriate embedded measures, the potential for **Significant** adverse effects to occur has been assessed in relation to a number of viewpoints during the construction, operation and maintenance and decommissioning phases of the Offshore Project.

5.14.1.15 **Table** 5.1 present a summary of assessment outcomes from the Seascape, Landscape and Visual Impact Assessment.

Table 5.1 SLVIA likely significant residual effects – summary

Assessment	Assessment Outcome
All phases: Construction, operation and maintenance and decommissioning	
Effects of visual receptors/views	**Significant effects occurring during the day-time and night-time at Viewpoint**: 4, Melbost Borve/*Mealabost Borgh*; 13 Barvas/*Barabhas;* 23 Shawbost/*Siabost*; 30 Gallan Head/*Àird Uig*; 32 Reef Beach **Significant effects occurring during the day-time only at Viewpoint**: 1 Butt of Lewis/*Rubha Robhanais;* 2 Cross/*Cros;* 3 North Galston/*Gàbhsann*; 5 Shader/*Siadar an Rubha* Core Path; 6 Upper Shader/*Siadar Uarach; 7* Clach an Truiseil; 8 Upper Barvas/*Barabhas* Cemetery; 9 Upper Barvas/*Barabhas;* 10 Barvas/*Barabhas* Beach; 11 North of Brue/*Brù;* 12 Loch na Muilne; 14 Arnol/*Àrnoil* Blackhouse; 15 Arnol/*Àrnoil* Village; 16 Bragar/*Bhràdhagair* Beach; 17 Sheiling near Loch Urghag (between Brue/*Brù* and Arnol/*Àrnoil*); 18 Shawbost/*Siabost* Core Path; 19 A858 Abhainn Arnol/*Àrnoil*; 20 Bragar/*Bhràdhagair*; 21 A857 (inland south of Barvas/*Barabhas*); 24 Dalbeg/*Dhail Beag* Beach; 25 Dalmore/*Dail Mhor* Beach; 26 Beinn na Cloich; 28 Doune Carloway/*Càrlabhagh*; 29 Bosta/*Bostadh*; 31 Valtos; 33 Forsnabhal; 34 Camas na Clibhe; 36 Carishader/*Cairsiadar*; 37 Callanish/*Calanais*; 38 Mangersta/*Mangurstadh* Head; 39 Mealaisbhal; 41 Sgalabhal.
Effects on Coastal Character	**Significant effects occurring to Coastal Character Areas:** CCA2 Eoropie/ *Eòrapaidh*; CCA3 Borve/*Borgh*, Shader/*Siadar an Rubha* and Galston/*Gàbhsann* low rocky coast; CCA4 Barvas Sands/*Barabhas Sands* and Àird Bharabhais; CCA5 Bragar/*Bhràdhagair* and Port Arnol/*Àrnoil*; CCA6 Loch Shiaboist; CCA7 Dalbeg/*Dhail Beag* and Dalmore/*Dail Mhor* coast to Aird Laimishader/*Àird Laimisiadair*; CCA11 Bernera Islands; CCA14 An Caolas including Reef Beach and Cliff Beach/*Camas na Clibhe*; CCA15 Gallan Head/*Gallan Beag*; CCA17 Mangersta/*Mangurstadh* Head.

Assessment		Assessment Outcome
Effects on Landscape Character		**Significant effects occurring to Landscape Character Areas:** Boggy Moorland – Outer Hebrides (LCT 322); Prominent Hills and Mountains (LCT 326).
Effects on Landscape Qualities		**Significant effects occurring to the Special Landscape Qualities of National Scenic Areas:** Sub area 1 – The Outer Northwest Lewis/*Leòdhas* Coastline; Sub-area 2 – Lewis/*Leòdhas* Coastal Cnoc and Lochan; Sub-area 4 – The Lewis/*Leòdhas Hills and* Mountains.
Operation and maintenance phase only		
Effects of aviation and navigation lighting	**On viewpoints**	**Significant effects occurring during the night-time at Viewpoint**: 1 Butt of Lewis/*Rubha Robhanais;* 2 Cross/*Cros;* 4, Melbost Borve/*Mealabost Borgh;* 5 Shader/*Siadar an Rubha* Core Path; 6 Upper Shader/*Siadar Uarach; 7* Clach an Truiseil; 8 Upper Barvas/*Barabhas* Cemetery; 9 Upper Barvas/*Barabhas;* 10 Barvas/*Barabhas* Beach; 11 North of Brue/*Brù;* 12 Loch na Muilne; 13 Barvas/*Barabhas;* 14 Arnol/*Àrnoil* Blackhouse; 15 Arnol/*Àrnoil* Village; 16 Bragar/*Bhràdhagair* Beach; 17 Sheiling near Loch Urghag (between Brue/*Brù* and Arnol/*Àrnoil*); 18 Shawbost/*Siabost* Core Path; 19 A858 Abhainn Arnol/*Àrnoil*; 20 Bragar/*Bhràdhagair*; 21 A857 (inland south of Barvas/*Barabhas*); 23 Shawbost/*Siabost*; 24 Dalbeg/*Dhail Beag* Beach; 25 Dalmore/*Dail Mhor* Beach; 26 Beinn na Cloich; 28 Doune Carloway/*Càrlabhagh*; 29 Bosta/*Bostadh*; 30 Gallan Head/*Àird Uig*; 31 Valtos; 32 Reef Beach; 33 Forsnabhal; 34 Camas na Clibhe.
	On Coastal Character Areas	**Significant effects occurring during the night-time to Coastal Character Areas:** CCA2 Eoropie/ *Eòrapaidh*; CCA3 Borve/*Borgh*, Shader/*Siadar an Rubha* and Galston/*Gàbhsann* low rocky coast; CCA4 Barvas Sands/*Barabhas Sands* and Àird Bharabhais; CCA5 Bragar/*Bhràdhagair* and Port Arnol/*Àrnoil*; CCA6 Loch Shiaboist; CCA7 Dalbeg/*Dhail Beag* and Dalmore/*Dail Mhor* coast to Aird Laimishader/*Àird Laimisiadair*; CCA11

Assessment	Assessment Outcome	
		Bernera Islands; CCA14 An Caolas including Reef Beach and Cliff Beach/*Camas na Clibhe*; CCA15 Gallan Head/*Gallan Beag*; CCA17 Mangersta/*Mangurstadh* Head.
	On Special Landscape Qualities	**Significant effects occurring during the night-time to the Special Landscape Qualities of National Scenic Areas:** Sub area 1 – The Outer Northwest Lewis/*Leòdhas* Coastline; Sub-area 2 – Lewis/*Leòdhas* Coastal Cnoc and Lochan; Sub-area 4 – The Lewis/*Leòdhas Hills and* Mountains.

5.14.1.16 The magnitude of change to views of the Offshore Project with the addition of the OTW Project is expected to increase, but to remain **Major** (**Significant**) (with major being the maximum assessment threshold) for the following Viewpoints:

- Viewpoint 8: Upper Barvas/*Barabhas* Cemetery and Viewpoint 9: Upper Barvas/*Barabhas Uarach*
- Viewpoint 11: North of Brue/Brù
- Viewpoint 13: Barvas/*Barabhas*
- Viewpoint 43: Druim nan Carnan
- Viewpoint 44: Morven

5.14.1.17 The magnitude of change to views of the Offshore Project with the addition of the OTW Project is expected to increase, but to remain **Major** (**Significant**) (with major being the maximum assessment threshold) for the following Coastal Character Areas:

- CCA4, its associated coastal areas of Boggy Moorland (LCT 322) and adjacent area of Gently Sloping Crofting (LCT 317)

5.14.1.18 **No Significant** cumulative effects have been identified in relation to the Offshore Project from SLVIA resulting from construction, operation and maintenance, and decommissioning activities.

5.14.1.19 **No Significant** combined effects of greater significance compared to the impacts considered alone were identified in SLVIA from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.14.1.20 **No Significant** transboundary effects have been identified in relation to the Offshore Project in SLVIA during construction, operation and maintenance, and decommissioning activities.

5.15 OFFSHORE AIRBORNE NOISE

How effects on airborne noise have been assessed

5.15.1.1 The offshore airborne noise assessment considers how noise from the Offshore Project phase may be experienced by Noise Sensitive Receptors. The selected Noise Sensitive Receptors are residential settlements located along, but inside the northwest coastline of the Isle of Lewis/*Eilean Leòdhais,* at Garenin/*Na Gearrannan*, Dalmore/*Dail Mhor*, South Shawbost/*Siabost bho Dheas*, Labost, Brue/*Brù*, Ballantrushal/*Baile an Truiseil*.

5.15.1.2 The assessment considers the relevant effects associated with the construction and operation of the Offshore Project, including:

Construction

- Percussive piling noise generated by the construction of the Offshore Project

Operation

- Operational noise from the Offshore Wind Turbine Generators

Baseline environment

5.15.1.3 A desk study was undertaken to inform the offshore airborne noise assessment. It assisted in establishing the baseline environment for airborne noise by identifying current and future noise sources within the Study Area. It also informed the assessment by identifying the operational noise levels of relevant Wind Turbine Generator models.

5.15.1.4 A site survey was also undertaken to establish the background noise levels at the locations identified as having noise sensitive receptors. The survey locations were selected to be representative of the locations around the identified receptors. The weather at each location during the survey was also recorded.

5.15.1.5 The dominant noise sources within the Study Area are produced by nature, such as by the wind and by wave action at the coast. Some temporary noise peaks were identified as a result of passing vehicles and machines. Wind speed and direction was found to influence the measurement of background levels and was accounted for in the interpretation of the data.

5.15.1.6 Over the lifetime of the Offshore Project, the naturally produced background noise levels along the northwest coast of the Isle of Lewis*/Eilean Leòdhais* are expected to remain generally unchanged. Some increases in road traffic noise may occur in future, consistent with typical growth trends and potential rises in local vehicle usage. However, marked change in land use or population density are not anticipated.

Embedded environmental measures

5.15.1.7 A range of environmental measures that relate to the offshore airborne noise are embedded as part of the Offshore Project to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the offshore airborne noise assessment are:

- M019: A final Offshore Environmental Management Plan (OEMP) will be developed prior to commencement of construction (building on Outline Offshore EMP, Volume 3) in compliance with legislative requirements and/or best practice standards and guidance and adhered to.
- M023: Offshore construction within the Turbine Area will only be undertaken during the April–October period, except for offshore Landfall construction works located within the HDD Exit Pit Area.

Additional environmental measures

5.15.1.8 Additional environmental measures have been developed to provide secondary mitigation in instances where likely significant effects have been concluded:

- A007: The Airbourne Noise Piling Strategy will be developed to incorporate further measures, such as those identified in **Chapter 19: Offshore Airborne Noise**, **Volume 2c**, to mitigate the potential impacts of the percussive piling activity to an acceptable level.

Likely significant residual effects

5.15.1.9 When the embedded environmental measures to prevent, control and limit the potential for effects from offshore airborne noise during the lifetime of the Offshore Project are taken into account, there are **No Significant Effects** anticipated.

5.15.1.10 **No Significant** effects as a result of the OTW Project of greater significance compared to the impacts considered alone were identified from offshore airborne noise from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.15.1.11 **No Significant** cumulative effects have been identified in relation to the Offshore Project from offshore airborne noise resulting from construction, operation and maintenance, and decommissioning activities.

5.15.1.12 **No Significant** combined effects of greater significance compared to the impacts considered alone were identified from offshore airborne noise from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.15.1.13 **No** Significant transboundary effects have been identified in relation to the Offshore Project from offshore airborne noise during construction, operation and maintenance, and decommissioning activities.

5.16 OTHER SEA USERS, TOURISM AND RECREATION

How effects on other sea users, tourism and recreation have been assessed

5.16.1.1 The assessment of other sea users, tourism and recreation considers how the Offshore Project could interact with existing third party activities within the Study Area, which is defined as the Array Area and Offshore Cable Area of Search plus a 1 km buffer.

5.16.1.2 The third party activities considered include aquaculture companies and operators, maritime activities associated with ports, harbours, slipways and marinas, boat tour operators, recreational anglers and angling tour operators, coastal water sports, and the use of recreational assets (e.g. visitor attractions, public rights of way, and accommodation) by tourists.

5.16.1.3 The assessment considers the effects associated with all project phases, including:

Construction and Decommissioning

- Temporary disruption/displacement to aquaculture support vessels, such as increased steaming times due to presence of installation safety zones and construction activities;
- Temporary disruption to ports and harbours due to presence of Project vessels;
- Temporary displacement/disturbance to boat tour operators, surfers or other sea users due to presence of installation safety zones and construction activities;
- Temporary displacement/disturbance to recreational sea anglers and specific angling tour operators due to presence of installation safety zones and construction activities;
- Amenity effects from a combination of visual and noise impacts and potential reduction in amenity value for other sea users and onshore tourism and recreational users.

Operation and Maintenance

- Permanent displacement from discrete areas where Offshore Project infrastructure is installed and temporary disruption to aquaculture support vessels, such as increased steaming times;
- Temporary disruption to ports and harbours due to presence of Project vessels;
- Permanent displacement from discrete areas where Offshore Project infrastructure is installed and temporary disruption to boat tour routes, surfers and other sea users during O&M activities;
- Permanent displacement from discrete areas where Offshore Project infrastructure is installed and temporary disruption to recreational sea anglers and specific angling tour operators during O&M activities;
- Amenity effects and reduction in amenity value other sea users and onshore tourism and recreational users.
- Effects on wave resource and surf quality due to the physical presence of Offshore Project infrastructure.

Baseline environment

5.16.1.4 Data to inform the assessment has been gathered from publicly available sources including the North Scotland Sectoral Plan 2020, Marine Directorate Interactive Map (Marine Scotland, 2025), Visit Scotland tourism statistics, Strava heat mapping and wider datasets for recreational boating and water sports activities.

5.16.1.5 Site specific vessel traffic surveys were undertaken in 2023 and 2024, which have provided vessel type and routing data to inform the assessment. These survey data have also been used to inform the shipping and navigation assessment.

5.16.1.6 On the west of the Isle of Lewis/*Eilean Leòdhais*, there are 4 aquaculture companies that operate for finfish and shellfish within Loch Roag/*Loch Ròg*. The large export and processing vessels that service these operations generally travel along the northwest coast and around the Butt of Lewis/*Eilean Leòdhais* to Stornoway/*Steòrnabhagh*. Vessel traffic associated with day-to-day aquaculture operations and with the smaller shellfish farms within Loch Roag/*Loch Ròg* is confined to the waters within the Loch and along the northwestern coast of the Isle of Lewis/*Eilean Leòdhais*, south of the Array Area.

5.16.1.7 The main port on the Isle of Lewis/*Eilean Leòdhais* is located at Stornoway/*Steòrnabhagh* on the east coast. Other local ports and harbours along the northwest coast of the Isle of Lewis/*Eilean Leòdhais* and south of the Offshore Project are located within Loch Roag/*Loch Ròg* and include Carloway/*Càrlabhagh*, Breasclete/*Brèascleit*, Bernera/*Beàrnaraigh*, and Miavaig/*Mìobhaig*.

5.16.1.8 These ports are dependent on local fishing and tourism, particularly for smaller vessels. Large offshore vessels occasionally use Loch Roag/*Loch Ròg* as an anchorage area during adverse weather conditions, with the closest designated safe port and anchorage area for larger vessels located at Stornoway/*Steòrnabhagh*.

5.16.1.9 Ferry routes and pleasure craft operate in the Study Area and there are numerous boat operators that offer trips to historic, nature interest, and sea angling sites. Tourism is a major contributor to the economy of the Isle of Lewis/*Eilean Leòdhais* and the wider Western Isles/*Na h-Eileanan Siar*.

5.16.1.10 Coastal water sports including surfing, wind and kite surfing, kayaking, scuba diving, and open water swimming all occur within the Study Area. The most frequented area to surf on the island is along the west coast, particularly between Ballantrushal/*Baile an Truiseil* and Carloway/*Càrlabhagh*, with concentrations of surfing activity at Barvas/*Barabhas* and Dalmore/*Dail mhòr* beaches, and to a lesser extent at Labost/*Àirigh nan Crodh*. Most coastal recreation including angling occurs within 5 km of the coastline.

Embedded environmental measures

5.16.1.11 A range of environmental measures that relate to other sea users, tourism and recreation impacts are embedded as part of the Offshore Project to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the other sea users, tourism and recreation assessment are:

- M015: Compliance of all Offshore Project vessels with international marine regulations as adopted by the Flag State, notably the International Regulations for Preventing Collisions at Sea (COLREGs) (IMO, 1972/1977) and the International Convention for the Safety of Life at Sea (SOLAS) (IMO, 1974).
- M042: Project to work with key stakeholders and service providers to understand pressure points on existing services and on storage / port facilities on Lewis, and charter vessels and/or flights to transport crew and materials where required to avoid creating excess pressure, and potentially provide additional capacity. Large components to be transported by specialist vessels via private charter. Potential for collaborative approaches with other developers, including through the Renewable Energy: Major Developers Forum.

Likely significant residual effects

5.16.1.12 When the embedded environmental and additional measures to prevent, control and limit the potential for effects on other sea users, tourism and recreation during the lifetime of the Offshore Project are taken into account, there are **No Significant Effects** anticipated.

5.16.1.13 **No Significant** effects as a result of the OTW Project of greater significance compared to the impacts considered alone were identified for other sea users, tourism and recreation receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.16.1.14 **No Significant** cumulative effects have been identified in relation to the Offshore Project on other sea users, tourism and recreation from construction, operation and maintenance, and decommissioning activities.

5.16.1.15 **No Significant** combined effects of greater significance compared to the impacts considered alone **were** identified for on other sea users, tourism and recreation receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.16.1.16 **No Significant** transboundary effects have been identified in relation to the Offshore Project on other sea users, tourism and recreation from construction, operation and maintenance, and decommissioning activities.

5.17 COMMERCIAL FISHERIES

How effects on commercial fisheries have been assessed

5.17.1.1 The commercial fisheries assessment considers how the Offshore Project could impact on potting vessels, demersal otter trawlers, pelagic trawlers, dredgers, commercial shellfish diving, gear with hooks, and bottom set nets.

5.17.1.2 A local and regional Study Area was identified using areas defined by the International Council for the Exploration of the Sea (ICES). This enabled activities within the Offshore Project including the Array Area and the Offshore Cable Area of Search to be considered, as well as those in surrounding waters. Most commercial fish and shellfish receptor populations are widely distributed, so the analysis of regional-scale data allows consideration to be given to the potential implications of fishing displacement over wide areas.

5.17.1.3 The assessment considers the effects associated with all project phases (construction, operation and maintenance and decommissioning), including:

- Reduction in access to, or exclusion from established fishing grounds in the Array Area and Offshore Cable Area of Search leading to reduced fishing opportunities;
- Displacement leading to conflict in fishing gear and increased fishing pressure on adjacent grounds;
- Disruption of commercially important fish and shellfish resources;
- Increased project-related vessel traffic leading to interference with fishing activities;
- Localised safety zones resulting in additional steaming to alternative fishing grounds;
- Physical presence of infrastructure leading to gear snagging, with potential navigational safety and financial loss implications.

Baseline environment

5.17.1.4 Data on commercial fishing activities and catches has been sourced from ICES, the European Union (EU) Data Collection Framework (DCF), the Marine Directorate National Marine Plan interactive (NMPi), the UK Marine Management Organisation (MMO), and the European Maritime Safety Agency.

5.17.1.5 The data include landing statistics, vessel route densities, activity plotter data, and sighted potting locations. Where data sources allowed, a 5-10 year trend analysis was undertaken, with data time periods ranging from 2012 to 2022.

5.17.1.6 The key species landed from the Commercial Fisheries local Study Area are Norway lobster (also known as langoustine, prawn, or 'nephrops'), lobster, brown crab, Ballan wrasse, razor clam, king scallop, velvet crab, horse mackerel, and mackerel.

5.17.1.7 The potting fisheries (lobster, nephrops, brown crab, and velvet crab) account for £1.5 million first sales value landed annually from the local Study Area, compared to £1.9 million from the regional

Study Area. The demersal otter trawl fisheries (monkfish, haddock, mixed finfish, squid, and nephrops) account for £1.9 million first sales value landed annually from the local Study Area, compared to £6.9 million from the regional Study Area.

5.17.1.8 Scallop dredging, hook and line fisheries primarily for mackerel, and pelagic trawl fisheries (also for mackerel) represent significantly smaller first sales values in the local Study Area.

5.17.1.9 The future baseline will be influenced by factors such as market demand, market prices, stock abundance (including variations in species availability resulting from climate change), fisheries and environmental management measures, as well as in response to offshore wind developments around Scotland.

Embedded environmental measures

5.17.1.10 A range of environmental measures that relate to commercial fisheries impacts are embedded as part of the Offshore Project to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the commercial fisheries assessment are:

- M026: A final Fisheries Mitigation, Monitoring and Communication Plan (FMMCP) (building on FMMCP, Volume 3) will be developed in compliance with legislative requirements and/or best practice standards and guidance prior to the operation of the Project and adhered to.
- M027: Establishment and participation in a Project specific Commercial Fisheries Working Group (CFWG) will be undertaken to facilitate liaison between the Offshore Project and the wider fishing community.
- M028: As outlined in the FMMCP, Volume 3, a Company Fisheries Liaison Officer (CFLO), Fishing Industry Representative (FIR), and Offshore Fisheries Liaison Officer(s) (OFLOs) will be appointed prior to commencement of development to liaise with local, regional and national fishing organisations, as well as individual fishers on offshore activities undertaken in relation the Offshore Project.

Additional environmental measures

5.17.1.11 Additional environmental measures have been developed to provide secondary mitigation in instances where likely significant effects were identified in the initial assessment:

- A001: The use of rock bags or rock berms for Offshore Cable protection within the Array Area will be limited to within 50 m of WTG and Offshore Substation Platform infrastructure.
- A002: The Offshore Project will endeavour to route the Offshore Cables network to maximise resumption of fishing were possible.
- A003: Disruption Agreements will be implemented to coordinate and agree appropriate co-operation and establish evidence-based disruption payments to fishermen, where identified as significant within the EIA.

Likely significant residual effects

5.17.1.12 When the embedded environmental and additional measures to prevent, control and limit the potential for effects on **commercial** fisheries during the lifetime of the Offshore Project are taken into account, there are **No Significant Effects** anticipated.

5.17.1.13 **No Significant** effects as a result of the OTW Project of greater significance compared to the impacts considered alone were identified for commercial fisheries receptors from construction, operation and **maintenance**, and decommissioning activities of the Offshore Project.

5.17.1.14 **No Significant** cumulative effects have been identified in relation to the Offshore Project on commercial **fisheries** from construction, operation and maintenance, and decommissioning activities.

5.17.1.15 **No Significant** combined effects of greater significance compared to the impacts considered alone **were** identified **for** on commercial fisheries receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.17.1.16 **No Significant** transboundary effects have been identified in relation to the Offshore Project on commercial **fisheries** from construction, operation and maintenance, and decommissioning activities.

5.18 OFFSHORE HUMAN HEALTH

How effects on offshore human health have been assessed

5.18.1.1 The assessment of offshore human health considers how the resident population of the Isle of Lewis/*Eilean Leòdhais* may be impacted by all phases of the Offshore Project. Consideration was given to vulnerable groups such as children, the elderly, people with existing health conditions, and socio-economically disadvantaged residents.

5.18.1.2 A Study Area was defined to give consideration to the local authority area of Na h-Eileanan Siar (hereafter referred to as the 'Western Isles') which includes the Isle of Lewis and Harris/*Leòdhas agus Na Hearadh*. This Study Area captures effects on indirect health determinants such as access to health-related services.

5.18.1.3 The Smaller Study Area (SSA) includes onshore communities that may be impacted by the development, construction and operation of the Offshore Project such as noise, visual impacts, and changes in access to healthcare services. This Study Area includes coastal communities between Carloway/*Càrlabhagh* and Ness/*Nis* that may have strong economic, social, or cultural links to the marine environment.

5.18.1.4 The assessment considers the effects associated with all project phases (construction, operation and maintenance and decommissioning), including:

Construction and Decommissioning

- Noise, vibration and visual impacts resulting in adverse mental and physical health impacts;
- An incoming workforce that creates an increased pressure on healthcare and emergency services.

Operation and Maintenance

- Noise and vibration from operational Wind Turbine Generators causing long-term annoyance or stress;
- Visual changes to the seascape and coastal views leading to mental wellbeing impacts and a change in connection with place;
- Population change arising from an incoming workforce leading to increased pressure on public services.

Baseline environment

5.18.1.5 The data used to inform the offshore human health assessment was sourced from credible government, industry, and academic sources, including the Office for National Statistics (ONS) and National Records of Scotland (NRS).

5.18.1.6 The baseline for human health was defined in terms of population and demographics, religion, community health and well-being, wider determinants of health (including social isolation, crime, employment, income, deprivation, children in low-income households, and fuel poverty). The availability of healthcare facilities was also established.

5.18.1.7 In the Western Isles, rates of physical disability and long-term health conditions are higher than the national average, reflecting the higher proportion of older residents. Economic activity is slightly above the Scottish average, but there is a greater tendency toward self-employment and part-time work, with incomes often supplemented by crofting or other traditional activities. While the area is less diverse overall, it is marked by strong community ties, a rich cultural heritage, and higher levels of social capital and mutual support.

5.18.1.8 Whilst the evidence shows availability of health facilities, there are also signs that the current health care provision is facing pressures, including in relation to recruitment. A key theme to emerge from stakeholder engagement focus groups and interviews was the pressure on service provision in Lewis/*Eilean Leòdhais* and the Western Isles and dental care was specifically identified as a service with provision challenges.

5.18.1.9 Vulnerable groups of note in the baseline data for the Study Area included:

- A higher prevalence of older people;
- Residents with a prevalence of long-term health conditions, physical disabilities and sensory impairments.

5.18.1.10 In addition to vulnerable groups, the following key sensitivities were identified in the baseline.

- High levels of alcohol-related hospital admissions indicating substance misuse as a concern;
- Below average levels of higher education attainment;
- Below average median income.

5.18.1.11 The population of the Western Isles is projected to decrease by 14.5% from 2018 to 2043, which is higher than the national trend of a projected increase of 2.5%. An ageing population affects health issues and the demand on health and care services.

Embedded environmental measures

5.18.1.12 A range of environmental measures that relate to offshore human health impacts are embedded as part of the Offshore Project to reduce or minimise the potential magnitude of environmental effects as far as possible. Key measures for the offshore human health assessment are:

- M040: Due regard will be given to landscape and visual design principles in the Design Specification Layout Plan post consent, with consideration of the seascape, landscape and visual impacts of the Offshore Project on the NSA. The DSLP will be shared with and approved by MD-LOT prior to construction commencing.
- M041: The offshore construction workforce to be accommodated on vessels, with the exception of certain limited circumstances such as crew change over and leave, to reduce additional demand for housing / tourist accommodation on Lewis/*Eilean Leòdhais*. Medical

facilities to be provided on board vessels to treat minor injuries / illness and reduce additional pressure on existing services.

- M044: The Project is committed to the establishment of a Community Panel (subject to agreed community participation), comprising a range of community representatives with relevant experience and local knowledge. The purpose of the panel will be to ensure that local voices and perspectives can inform delivery of the Project as it progresses. It is proposed that the panel would be in place prior to the commencement of major construction activities and would be maintained throughout construction and commissioning. During operation, the Project will continue to engage with local communities and will provide opportunities for local residents to contact the Project team, including through dedicated resources within the operation and maintenance team with responsibility for community engagement.

Likely significant residual effects

5.18.1.13 The health impact of visual changes during the operation and maintenance phase to seascape and coastal views is **Potentially Significant** locally for the most exposed settlements and vulnerable groups. Visual effects are unavoidable given the scale and nature of the Offshore Project.

5.18.1.14 **No Significant** effects as a result of the OTW Project of greater significance compared to the impacts considered alone were identified for offshore human health receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.18.1.15 **No Significant** cumulative effects have been identified in relation to the Project on offshore human health from construction, operation and maintenance, and decommissioning activities.

5.18.1.16 **No Significant** combined effects of greater significance compared to the impacts considered alone were identified for on offshore human health receptors from construction, operation and maintenance, and decommissioning activities of the Offshore Project.

5.18.1.17 **No Significant** transboundary effects have been identified in relation to the Offshore Project on **offshore** human health from construction, operation and maintenance, and decommissioning activities.

6 GLOSSARY OF TERMS AND ABBREVIATIONS

6.1.1.1 A list of key terms and acronyms used in this chapter are provided in **Table 6.1** and **Table 6.2**.

Table 6.1 Acronyms and abbreviations

Term	Definition
AC	Alternating Current
AGA	Air-Ground-Air
AMSL	Above Mean Sea Level
ATS	Air Traffic Services
CAA	Civil Aviation Authority
CBRA	Cable Burial Risk Assessment
CDM	Construction (Design and Management)
CES	Crown Estate Scotland
CFLO	Company Fisheries Liaison Officer
CLO	Community Liaison Officer
CRI	Climate Risk Indicators
DEFRA	Department for Environment Farming and Rural Affairs
EEA	European Economic Area
EIAR	Environmental Impact Assessment Report
EIA	Environmental Impact Assessment
EMF	Electro-magnetic Field
ERCOP	Emergency Response Cooperation Plan
ESB	Electricity Supply Board
EU	European Union
FIR	Fisheries Industry Representative
FMMCP	Fisheries Mitigation, Monitoring and Communication Plan
GHG	Greenhouse Gases
HDD	Horizontal Directional Drilling
HRA	Habitat Regulations Assessment
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IALA	International Association of Lighthouse Authorities
ICE	Inventory of Carbon and Energy
ICES	International Council for the Exploration of the Sea
IEMA	Institute of Environmental Management and Assessment
INNS	Invasive Non-Native Species
JV	Joint Venture
LFA	Low Flying Area
LSE	Likely Significant Effect
MCA	Maritime and Coastguard Agency
MD-LOT	Marine Directorate Licensing
MHWS	Mean High Water Springs

Term	Definition
MMMP	Marine Mammal Management Plan
MMO	Marine Management Organisation
MOD	Ministry of Defence
MPCP	Marine Pollution Control Plan
MSL	Mean Sea Level
MW	Megawatt
NATS	National Air Traffic Services
NGESO	National Grid Electricity Systems Operator
NLB	Northern Lighthouse Board
NRS	National Records Scotland
NSA	National Scenic Area
NSVMP	Navigational Safety and Vessel Management Plan
NTS	Non-Technical Summary
OEMP	Outline Environmental Management Plan
ONS	Office for National Statistics
OREI	Offshore Renewable Energy Installation
OSP	Offshore Substation Platform
OTW	Onshore Transmission Works
PAC	Pre-Application Consultation
PAD	Protocol for Archaeological Discovery
PDE	Project Design Envelope
PSR	Primary Surveillance Radar
RAF	Royal Air Force
REZ	Renewable Energy Zone
RIAA	Report to Inform Appropriate Assessment
SAC	Special Areas of Conservation
SAR	Search and Rescue
SCADA	Supervisory Control and Data Acquisition
SLVIA	Seascape, Landscape Visual Impact Assessment
SMU	Seal Management Unit
SSA	Smaller Study Area
SSEN	Scottish and Southern Electricity Networks
SSR	Secondary Surveillance Radar
TJB	Transition Joint Bay
UK	United Kingdom
UKCP18	UK Climate Projections 2018
UXO	Unexploded Ordnance
WFD	Water Framework Directive
WSI	Written Scheme of Investigation
WTG	Wind Turbine Generator

Table 6.2 Glossary

Term	Meaning
Array Area	The offshore area within which the offshore wind turbine generators (WTGs), associated foundations, Offshore Cables, and Offshore Substation Platform (OSP) (if required), will be located. This area encompasses the Turbine Area that will contain all above water surface infrastructure (WTGs / OSP) and an additional area within which further below water infrastructure (foundations and cables) may also be located.
Array Cables	The offshore electrical and communication cables that connect infrastructure located within the Array Area, for: • Scenario 1: Array Cables will used to connect Wind Turbine Generators to each other, and to connect Wind Turbine Generator to the Offshore Substation Platform. • Scenario 2: Array Cables will used to connect Wind Turbine Generators to each other.
Array Cables to Landfall	The offshore electrical and communication cables located in the Array Area and Offshore Cables Area of Search that connect the wind turbine generators (WTGs) directly to Landfall for Scenario 2.
Aspect	An individual environmental topic that is considered in the Environmental Impact Assessment (EIA).
Avoidance	Probability that a bird takes successful evasive action to avoid collision with a turbine.
Baseline	Existing conditions as represented by the latest available data, whether from literature or survey and used as a benchmark for making comparisons to assess the impact of a development or project.
Baseline conditions	The environment as it appears (or would appear) immediately prior to the implementation of a project, together with any known or foreseeable future changes that will take place before its completion.
Benthic species	Fish that live on or near the seabed.
Blue carbon	Carbon sequestered in biological material and sediments in the sea.
Boulder clearance	Boulder clearance is the process of displacing boulders rather than removing them from the site, ensuring the seabed is free from large obstructions that could interfere with the installation of cables.
Climate hazard	The potential occurrence of a natural or human-induced physical event or trend that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources.
Climate impact	"Impact" is used primarily to refer to the effects on natural and human systems of extreme weather and climate events and of climate change. Impacts generally refer to effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services and infrastructure due to the interaction of climate change or hazardous climate events occurring within a specific time-period and the vulnerability of an exposed society or system. Impacts are also referred to as consequences and outcomes. The impacts of climate change on geophysical systems, including floods, droughts and sea level rise, are a subset of impacts called "physical impacts".
Cnoc	Gaelic term for hill.
Coastal water	Water depths between 5 m and 20 m.
Crofting	A system of small-scale farming for subsistence and economic gain that is based on tenancy-based landholdings. It is specific to the Highlands and Islands of Scotland.
Collision	Contact between two or more moving vessels.
Collision risk	Risk of a bird lethally colliding with a wind turbine within a wind farm.
Combined Effects	Combined effect of the individual development on one particular receptor; for example noise, dust and visual. This includes Project-Lifetime Effects and Receptor-Led Effects.

Term	Meaning
Controlled Airspace	Defined airspace within which pilots must follow Air Traffic Control instructions. In the UK, Classes A, C, D and E are areas of controlled airspace.
Construction phase	The period during which a development and its associated processes are constructed.
Consultation	The dynamic process of dialogue between individuals or groups, based on a genuine exchange of views and, normally, with the objective of influencing decisions, policies or programmes of action.
Crew Transfer Vessel (CTV)	Construction support vessels that may be required for WTG generator installations.
Cultural Heritage	The historic environment and especially valued assets and qualities such as historic buildings and cultural traditions.
Cumulative Effects	Considers the likely significant effects of multiple impacts and activities from several developments. .
Cumulative Effects Assessment (CEA)	Assessment of effects as a result of the incremental changes caused by other past, present and reasonably foreseeable human activities and natural processes together with the Offshore Project.
Cumulative impact	Impacts resulting from incremental changes caused by other past, present or reasonably foreseeable actions together with the Offshore Project.
Decommissioning phase	The period during which a development and its associated processes are withdrawn from service.
Deep water	Water depths greater than 20 m.
Demersal species	Fish that live on or near the seabed.
Department for Energy Security and Net Zero (DESNZ)	The Government department responsible for UK energy security, protecting billpayers and reaching net zero.
Designated site	Areas specifically recognised for their nature conservation value, such as those protected under national or international legislation.
Designated site of geological interest	Areas with protected status designated as earth science features and geological importance.
Direct Current (DC)	A type of electrical current which has a one-directional flow of electric charge.
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the importance, or sensitivity, of the receptor or resource in accordance with defined significance criteria.
EIA Regulations	Terminology used in the Environmental Impact Assessment Report to refer to three sets of EIA regulations: The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, with regard to the Section 36 consent application for the Offshore Project; The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017, in relation to the Offshore Project with regard to marine licence applications; Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, with regard to consent for the Onshore Transmission Works (OTW).
Electromagnetic field (EMF)	An electric and magnetic force field that surrounds a moving electrical charge.

Term	Meaning
Embedded or 'Designed-in' Mitigation	Mitigation measures to avoid or reduce environmental effects that are directly incorporated into the preferred design for the Project. This can include standard practice in accordance with or without guidance. Embedded Mitigation is considered as part of the impact assessment, before effect significance is identified.
Environmental Impact Assessment (EIA)	The process of evaluating the likely significant environmental effects of a proposed project or development over and above the existing circumstances (or 'baseline').
Environmental Impact Assessment Report (EIAR)	The Environmental Impact Assessment Report (EIAR) prepared to assess the likely significant effects of the Project on the environment.
Environmental quality standard	In the water context, a value of a concentration or other parameter used in compliance assessment and defined to ensure protection of the water environment generally or in relation to a specific use when compliance is achieved.
European Sites	Formerly known as 'Natura Sites', European Sites are those that are designated through the Habitats Directive and Birds Directive (via national legislation as appropriate). European sites in Scotland/*Alba* are considered to be Special Protection Areas (SPAs), Special Areas of Conservation (SACs), candidate SACs and Sites of Community Importance (SCI), Potential SPAs (pSPA), possible SACs (pSACs), Ramsar sites (designated under international convention) and proposed Ramsar sites.
Export Cable	The offshore electrical and communication cables located in the Array Area and Offshore Cables Area of Search that connect the Offshore Substation Platform (OSP) (if required) to Landfall for Scenario 1.
Geology	The study of the rocks and similar substances that make up the earth's surface.
Geomorphological changes	Changes to topographic or bathymetric features generated by physical, chemical, or biological processes.
Geomorphological features	Topographic or bathymetric features generated by physical, chemical, or biological processes.
Geophysical survey	Imaging or mapping using ground-based physical sensing.
Gigawatt (GW)	One billion watts.
Greenhouse Gas (GHG) emissions	GHG emissions are determined by the Kyoto Protocol (1997) to include six categories of gases: carbon dioxide, methane, nitrous oxide, F-gases (hydrofluorocarbons and perfluorocarbons), sulphur hexafluoride and nitrogen trifluoride. To provide consistent reporting of these gases, each is weighted by its global warming potential and converted to a carbon dioxide equivalent (CO_2e).
Grid Substation	The onshore substation located adjacent to and connecting to the SSEN Lewis Hub. This allows the voltage to be increased to meet onward transmission requirements.
Habitat	Term most accurately meaning the place in which a species lives but also used to describe plant communities or agglomerations of plant communities.
Habitat Regulations Appraisal	An assessment required for all developments which are deemed likely to have an adverse effect on a protected European Site.
Habitats Regulations	Related to the conservation of natural habitats and of wild fauna and flora, translated into specific legal obligations in Scotland/*Alba* by the Conservation (Natural Habitats, &c.) Regulations 1994.
Heritage Asset	An element of the historic environment that has value in policy.

Term	Meaning
High Voltage Alternating Current (HVAC)	A high voltage alternating current (HVAC) electric power transmission system transmit electricity using alternating current, where the flow of electric charge periodically reverses direction. Most HVAC systems operate at high voltages from 138 kV to 500 kV.
High Voltage Direct Current (HVDC)	A high voltage, direct current (HVDC) electric power transmission system uses direct current for electric power transmission, in contrast to the more common alternating current systems. Most HVDC links use voltages between 100 kV and 800 kV.
Historic Environment	The physical evidence of past human activity.
Historic Environment Scotland (HES)	Historic Environment Scotland is the lead public body established to investigate, care for and promote Scotland/*Alba*'s historic environment.
Horizontal Directional Drill (HDD)	A trenchless crossing engineering technique using a drill steered underground without the requirement for open trenches. This method is able to carry out the underground installation of pipes and cables with minimal surface disruption.
Impact	Change that is caused by an action; for example, foundation installation (action) during construction which results in habitat loss (impact).
Infauna	Benthic organisms that inhabit the sediments of the seafloor, living within or partially within the substrate.
Impact pathway	The EIA for the Offshore Project utilises the 'source-pathway-receptor' model to identify relevant receptors, where applicable. This model highlights potential impacts of the Offshore Project on environmental receptors, establishing a clear link between impact sources and receptor. The impact pathway is the route through which the potential impacts (as a result of an effect of an activity) could reach a receptor.
Intertidal	The area of the shoreline which is covered at high tide and uncovered at low tide.
Intertidal zone	The area between Mean Low Water Springs (MLWS) and Mean High Water Springs (MHWS).
Indirect effects and secondary effects	Those effects that are not caused immediately by the Offshore Project but arise because of it. An example would be where indirect employment is created as suppliers increase their activities and hire new workers to provide the additional goods and services required by the Offshore Project.
Jack-up vessel	A jack-up vessel is a barge with legs that can be raised and lowered to install offshore wind farm components and foundations.
Landfall	This consists of works from offshore Horizontal Directional Drill (HDD) exit pits (located below MLWS) to onshore at the Transition Joint Bays (TJB) (located above MHWS). The infrastructure and installation methods associated with the Landfall involves both onshore and offshore components.
Landfall Substation	The optional onshore substation located on the west side of the Isle of Lewis/*Eilean Leòdhais*. Includes the platform, buildings and associated components which allows the voltage to be increased to meet onward transmission requirements.
Level of Impact	The outcome of a comparative appraisal of the effects within a specific topic along a specific alignment option after a consideration of the potential for mitigation, using professional judgement based on experience.
Likely Significant Effects	With respect to the Electricity Works (EIA (Scotland) Regulations 2017 and The Marine Works (EIA) Regulations 2017, a significant effect that may reasonably be predicted as a consequence of a plan or project, on the receiving environment.

Term	Meaning
Magnitude (of change)	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short term or long term in duration'. Also known as the 'degree' or 'nature' of change.
Marine Licence	Licence required for certain activities in the marine environment and granted under either the Marine and Coastal Access Act 2009 or the Marine (Scotland) Act 2010.
Marine Mammal	A specialised group of mammals, which have adapted to life in the oceans and seas (and some rivers).
Marine Scotland	Civil service directorate for Scotland/*Alba*, which is responsible for the integrated management of Scotland/*Alba*'s seas.
Marine Directorate - Licensing Operations Team (MD-LOT)	The regulator for determining marine licence applications on behalf of the Scottish Ministers in the Scottish inshore region (between 0 and 12 nautical miles) under the Marine (Scotland) Act 2010, and in the Scottish offshore region (between 12 and 200 nautical miles) under the Marine and Coastal Access Act 2009.
Maximum Design Scenario	The scenario within the Project Design Envelope with the potential to result in the greatest impact on a particular topic receptor, and therefore the one that should be assessed for that topic receptor. See **Chapter 3: Project Description, Volume 1a** for detailed description.
Mean High Water Springs	The average throughout a year of the heights of two successive high waters during those periods of 24 hours (approximately once a fortnight) when the tidal range is greatest.
Mean Low Water Springs	The average height of low water during neap tides, which occur when the tidal range is at its smallest - typically around the first and third quarters of the moon.
Megawatts (MW)	Unit of electrical power equal to one million Watts.
Micrositing	The process of positioning individual Offshore Project elements within localised environmental or technical constraints.
Mitigation	Term used to indicate avoidance, remediation or alleviation of adverse impacts.
Offshore Cables	Electrical and communication cables located within the Array Area and Offshore Cable Area of Search. The Offshore Cables consist of Array Cables, Array Cables to Landfall, and Export Cables.
Offshore Cable Area of Search (OCAS)	The area within which the offshore electrical and communication cables between the Array Area and Landfall up to Mean High Water Springs (MHWS) will be located.
Offshore Cultural Heritage	Heritage assets located within the offshore environment below the Mean High Water Spring. These assets comprise designated heritage assets (e.g. Historic Marine Protected Areas) and non-designated heritage assets (assets noted within the United Kingdom Hydrographic Office database, locally held Historic Environment Record and the National Record of the Historic Environment or Canmore).
Offshore Landfall Area	The area seaward of Mean High Water Springs (MHWS) within the Offshore Cable Area of Search (OCAS) that includes works associated with the Horizontal Directional Drill (HDD) installation, including HDD exit pit(s) (located below MLWS) and offshore cable connection to the onshore (TJB) (located above MHWS).
Offshore Project	The offshore components of the Spiorad na Mara offshore wind farm (the Project) located seaward of Mean High Water Springs (MHWS).
Offshore Project Boundary	The 'red line boundary' encompassing the Offshore Project.
Offshore Substation Platform (OSP)	The optional offshore substation located within the Turbine Area. Includes the platform and associated components which allows the voltage to be increased to meet onward transmission requirements.

Term	Meaning
Offshore Windfarm (OWF)	A group of WTGs located offshore.
Onshore	Pertaining to landward of MLWS.
Onshore Application	The application for consent under the Town and Country Planning (Scotland) Act 1997 (as amended).
Onshore Cables	Electrical and communication cables located within the Onshore Cable Corridor.
Onshore Cable Corridor	The area within which Onshore Cables and associated infrastructure will be located which is routed from the Transition Joint Bays (TJB) to the SSEN Lewis Hub.
Onshore Landfall Area	The area which includes both the Landfall above Mean Low Water Springs (MLWS) and Landfall Substation (as defined separately), cabling from the Transition Joint Bays (TJB) to the Landfall Substation (if required) and construction related compounds and working areas.
Onshore Transmission Works (OTW) / Onshore Project	The components of the Spiorad na Mara offshore wind farm located landward of Mean Low Water Springs (MLWS).
Onshore Transmission Works Boundary / Onshore Project Boundary	The 'red line boundary' encompassing all temporary and permanent works associated with the OTW/Onshore Project.
Operation and Maintenance (O&M) phase	The period during which a development is operational and being maintained.
Ornithology	The study of birds, their behaviour, physiology and taxonomy.
Outline Environmental Management Plan	An outline plan for ensuring implementation of appropriate environmental measures during the construction phase for the offshore components of the project. This will be finalised post-consent as a detailed plan, with involvement of contractors, as a condition of the marine licence.
Percussive Piling	A method of installing piles and pile casings into the seabed using an impact hammer. This form of piling can be solely used if ground conditions are suitable. If pile depth cannot be achieved through percussive piling alone, a pile-drill-pile technique can be used to reach desired depths. The percussive piling technique can be used for the installation of the Wind Turbine Generators (WTGs) and the Offshore Substation Platform (OSP) (if required) located within the Percussive Piling Area.
Percussive Piling Area	The area within the Turbine Area where both percussive piling, and drill and grout construction methods can be used for the installation of the wind turbine generators (WTGs) and the Offshore Substation Platform (OSP) (if required) fixed foundations.
Percussive Piling Exclusion Area	An area in the southwest of the Turbine Area where there will be no percussive piling. Other methods including drill and grout or vibratory methods can be used in this area.
Physical and Coastal Processes	Processes such as metocean conditions, seabed geology/morphology, sediment transport, and water quality which could be impacted by the Proposed Development.
Project	The Spiorad na Mara offshore wind farm development. This term describes the whole development, including all offshore and onshore components.
Project Boundary	The 'red line boundary' encompassing all offshore and onshore components of the Project.
Project Design Envelope (PDE)	A description of the range of possible components that make up the Project design options under consideration when the exact engineering parameters are not yet known.

Term	Meaning
Project-Lifetime Effects	Assessment of the scope for combined effects that occur throughout more than one phase of the project (i.e. construction, operation and maintenance, decommissioning), to interact to potentially create an effect of greater significance than if assessed just within individual/isolated project phases.
Public Consultation	Formal pre-application consultation with the local communities and interest groups, as required by the Marine Licensing (Pre-Application Consultation) (Scotland) Regulations 2013 and the Marine Scotland Act 2010, and the Energy Consents Unit Good Practice Guidance for Applications under Section 36 and 37 of the Electricity Act 1989 published by the Scottish Government (2022).
Receptor	Any physical, biological or anthropogenic element of the environment that may be affected or impacted by the Project. Receptors can include natural features such as the seabed and wildlife habitats as well as man-made features like fishing vessels and cultural heritage sites.
Receptor-Led Effects	Assessment of the scope for all combined effects to interact, spatially and temporally, to create an effect on a receptor of greater significance than when the effects are considered in isolation. Receptor-led effects may be short term, temporary or transient effects, or incorporate longer term effects.
Scheduled Monument	A monument which has been scheduled by the Scottish Ministers as being of national importance under the 'Ancient Monuments and Archaeological Areas Act 1979'.
Scoping Opinion	A report presenting the written opinion of the Scottish Ministers, with input from Comhairle nan Eilean Siar (CnES) for the OTW, as to the scope and level of detail of information to be provided in the Environmental Impact Assessment (EIA) for the Project.
Scoping Report	A document submitted by a developer that outlines the potential environmental issues and effects of a proposed project to determine which topics, methods, and level of detail should be included in the full Environmental Impact Assessment (EIA).
Section 36 Consent	Consent that can be granted under section 36 of the Electricity Act 1989 for the construction or extension, and operation, of an electricity generating station.
Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value associated to that receptor.
Significance	A measure of the importance of the environmental effect, defined by criteria specific to the environmental aspect.
Significant effect	It is a requirement of the EIA Regulations 2017 to determine the likely significant effects of the development on the environment, which should relate to the level of an effect and the type of effect. Where possible significant effects should be mitigated. The significance of an effect gives an indication as to the degree of importance (based on the magnitude of the effect and the sensitivity of the receptor) that should be attached to the impact described. Whether or not an effect should be considered significant is not absolute and requires the application of professional judgement. Significant – 'noteworthy, of considerable amount or effect or importance, not insignificant or negligible' (The Concise Oxford Dictionary). Those levels and types of landscape and visual effect likely to have a major or important / noteworthy or special effect of which a decision maker should take particular note.
Sites of Special Scientific Interest (SSSI)	Sites designated at the national level under the Wildlife & Countryside Act 1981 (as amended). They are a series of sites that are designated to protect the best examples of significant natural habitats and populations of species.

Term	Meaning
Special Area of Conservation (SAC)	An area designated under the EC Habitats Directive to ensure that rare, endangered or vulnerable habitats or species of community interest are either maintained at or restored to a favourable conservation status.
Special Landscape Area (SLA)	Landscapes designated by councils, which are considered to be of regional/local importance for their scenic qualities.
Special Protection Area (SPA)	An area designated under the Wild Birds Directive (Directive74/409/EEC) to protect important bird habitats. Implemented under the Wildlife and Countryside Act 1981.
Spring tidal excursion ellipse	The path followed by a water particle in one complete tidal cycle during a spring tide event.
Statutory Consultation	The process by which specific bodies are provided with information and are given the opportunity to comment on the Project. In terms of EIA this is stipulated by the EIA Regulations.
Study Areas	Study Areas are determined for each technical discipline and are described within each technical chapter.
Survey Area	The area within which a given survey was undertaken in order to obtain baseline information.
Suspended sediment concentration	The mass concentration (mass/volume) of sediment in suspension.
Temporal Scope	The temporal scope refers to the time periods over which impacts and effects may be experienced by sensitive receptors.
Temporary or permanent effects	Effects may be considered as temporary or permanent within a timeframe of relevance to the aspect or receptor in question.
The Crown Estate Scotland (CES)	The public corporation of the Scottish government that is responsible for the management of land and property in Scotland/*Alba*, as owned by the monarch "*in right of the Crown*".
The National Grid	The electricity transmission network in Great Britain.
Transboundary effects	Assessment of changes to the environment caused by the combined effect of past, present and future human activities and natural processes on other European Economic Area Member States.
Transition Joint Bay (TJB)	The point at which Offshore Cables are connected to Onshore Cables. The TJB is located onshore above MHWS.
Turbine Area	A reduced area within the Array Area where above water surface infrastructure would be located i.e. wind turbine generators (WTG) or Offshore Substation Platform (OSP) (if required). This area has been developed and refined through stakeholder consultation and environmental assessment.
Water Framework Directive (WFD)	European Community (EC)'s Water Framework Directive, sets out rules to halt deterioration in the status of water bodies and achieve good status for Europe's rivers, lakes and groundwater.
Water quality	Increase in physical, chemical and biological contaminants through the suspension of contaminated sediment, tidal currents transporting disturbed sediment leading to increased turbidity and/or reduced water-quality until sediment settlement.
Western Isles	Also known as the Outer Hebrides/*Na h-Eileanan Sia*, these are the islands situated to the northwest of Scotland/*Alba*.
Transition Joint Bay (TJB)	The point at which offshore cables are connected to Onshore Cables. The TJB is located onshore above MHWS.
Wind Turbine Generator	The wind turbines that generate electricity consisting of tubular towers and blades attached to a nacelle housing mechanical and electrical generating equipment.

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