3. SITE SELECTION AND REASONABLE ALTERNATIVES

3.1 Introduction

Article 5(1)(d) of Directive 2011/92/EU (the EIA Directive) of the European Parliament and of the Council of 13th December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) as amended by Directive 2014/52/EU requires that the Environmental Impact Assessment Report (EIAR) prepared by the Applicant contains *"a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment."*

Article 5(1)(f) of the EIA Directive requires that the EIAR contains "any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected."

As detailed in Section 1.1.1 of Chapter 1, for the purposes of this EIAR, the various project components are described as the 'Project'. The 'Offshore Site' includes the Offshore Array Area (OAA), Offshore 220kV Electrical Substation (OSS), as well as the Offshore Export Cable (OEC), Offshore Export Cable Corridor (OECC), and the Landfall. Where the 'Onshore Site' is referred to, this includes the Onshore Landfall Location(OLL), Onshore Grid Connection (OGC) and Onshore Compensation Compound (OCC).

This section of the EIAR contains a description of the reasonable alternatives that were considered by the Applicant for the Project, in terms of site location and other renewable energy technologies, as well as site layout incorporating size and scale of the project, connection to the national grid and infrastructure delivery options to the site. This section also outlines the design considerations in relation to the Project. It provides an indication of the main reasons for selecting the chosen design and layout option, including a comparison of the environmental effects. The consideration of alternatives is an effective means of avoiding potential environmental impacts. As set out in the Environmental Protection Agency's (EPA) document: *'Guidelines on The Information to be Contained in Environmental Impact Assessment Reports'* (EPA, 2022), the presentation and consideration of reasonable alternatives investigated is an important part of the overall EIA process.

It is important to acknowledge that although the consideration of alternatives is an effective means of avoiding environmental impacts, there are the existence of challenges when considering alternatives. These include hierarchy, non-environmental factors and site-specific issues as outlined below.

Hierarchy

EIA is concerned with projects. The Environmental Protection Agency's (EPA) *'Guidelines on the information to be contained in Environmental Impact Assessment Reports'*, (EPA, 2022) state that in some instances neither the applicant nor the competent authority can be realistically expected to examine options that have already been previously determined by a higher authority, such as a national plan or regional programme for infrastructure which have been examined by means of a Strategic Environmental Assessment,

Non-environmental Factors

EIA is confined to the potential significant environmental effects that influence consideration of alternatives. Other non-environmental factors may have equal or overriding importance to the Applicant, for example project economics, land availability, engineering feasibility or planning considerations.

Site-specific Issues

The EPA Guidelines state that the consideration of alternatives also needs to be set within the parameters of the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources. The site may be the only suitable area of land or sea available to the Applicant, or there may be a need for the project to accommodate demands or opportunities that are site-specific. Such considerations should be on the basis of alternatives within a site, for example design and layout.

3.2 Consideration of Reasonable Alternatives

3.2.1 Methodology

The EU guidance document: '*Guidance on the preparation of the Environmental Impact Assessment Report*' (EU, 2017), outlines the requirements of the EIA Directive and states that, in order to address the assessment of reasonable alternatives, the Applicant needs to provide the following:

- A description of the reasonable alternatives studied; and
- An indication of the main reasons for selecting the chosen option with regards to their environmental impacts.

There is limited European and National guidance on what constitutes a 'reasonable alternative' however the above noted document states that reasonable alternatives *"must be relevant to the proposed project and its specific characteristics, and resources should only be spent assessing these alternatives"*.

The guidance also acknowledges that "the selection of alternatives is limited in terms of feasibility. On the one hand, an alternative should not be ruled out simply because it would cause inconvenience or cost to the Applicant. At the same time, if an alternative is very expensive or technically or legally difficult, it would be unreasonable to consider it to be a feasible alternative".

The EPA Guidelines (2022) state that "It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account is deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required".

This chapter details the evolution of the Project, from as early as 2021 to the current project design as detailed. Details on the screening of 10 different sites, and then the site selection process is laid out below in Section 3.2.3.1. Alternative project design options are considered in Section 3.2.5.1, which ultimately leads to the final design of the Offshore Site.

Similar is done with the Onshore Site. Coastal Screening and Onshore Grid Feasibility Reports were completed as a means to identify an appropriate location along the Galway and Clare coasts where a cable could make landfall and where potentially a grid connection would connect onshore (see Section 3.2.3.2). As detailed in Section 3.2.5.2, multiple onshore grid connection routes were reviewed and screened out to determine the most suitable project design for the Onshore Site.

Taking the legislation and guidance requirements into account, this chapter of the EIAR addresses alternatives under the following main headings:

- 'Do Nothing' Alternative;
- Alternative Site Locations;
- Alternative Renewable Energy Technologies;
- Alternative Project Design Options
    - Offshore Site
        - Alternative Turbine Numbers and Model;
        - Alternative Turbine Layout and Development Design;
        - Alternative Turbine and Offshore Substation Foundations
        - Alternative Inter-Array Cable Route
        - Alternative Disposal Sites
        - Alternative Offshore Export Cable
        - Alternative Landfall Location
        - Alternative Ports
    - Onshore Site
        - Alternative Landfall Location
        - Alternative Onshore Grid Connection
        - Alternative Onshore Compensation Compound
        - Alternative Temporary Construction Compound
- Alternative Mitigation Measures
- Alternative Construction Methodologies.

Each of these is addressed in the following sections. Note that this application does not incorporate or seek permission for any design flexibility and the alternative designs discussed below are purely for the purposes of considering alternative as required under the EIA Directive.

When considering a wind farm development, given the intrinsic link between layout and design, the two are considered together in this chapter.

3.2.2 'Do-Nothing Alternative'

Annex IV, Part 3 of the EIA Directive states that the description of reasonable alternatives studied by the developer should include *"an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge."* This is referred to as the "do nothing" alternative. EU guidance (EU, 2017) states that this should involve the assessment of *"an outline of what is likely to happen to the environment should the Project not be implemented – the so-called 'do-nothing' scenario."*

Ireland has one of the highest average wind speeds in Europe and a vast maritime area that is seven times the size of the country's landmass. Given this natural advantage, offshore wind power must play an essential role in Ireland's future electricity generation and net-zero commitments. Through the Climate Action, and Low Carbon Development (Amendment) Act 2021, Ireland has committed to reach a legally binding target of net-zero emissions no later than 2050, and a cut of 51% by 2030 (compared to 2018 levels). Among the most important measures in the Climate Action Plan 2024 is a target of at least 5 GW of offshore wind energy by 2030. Ireland has what the Government describes as "enormous potential for offshore wind". In the longer term, offshore wind targets will increase to 20 GW by 2040, and at least 37 GW by 2050, as outlined in the Government's policy paper *'Accelerating Ireland's Offshore Energy Programme'*.

In recognition of these targets and the urgency surrounding them, the Project will aim to achieve the following:

- Supply electricity generated from wind energy to meet energy demand;
- Support the transition to a net-zero economy;
- Contribute to European and international commitments to climate change and renewable energy;
- Contribute to Ireland's target of at least 5 GW of offshore wind energy by 2030;
- Provide a secure source of energy;
- Deliver sustainable low-carbon economic growth.

A 'Do-Nothing' alternative would mean that the Project would not achieve any of the above aims and both the Offshore Site and Onshore Site would remain as it currently exists. The Offshore Site would remain as a marine area utilised for fishing and marine activity. The Onshore Site would remain with its current land-use practices of low-intensity agriculture, transport along the public road corridor, and recreational amenity. Both the offshore and onshore elements of the Project would not be constructed, and no wind farm would become operational off the west coast of Ireland as part of the Phase One projects. There would be a loss of approximately 450 MW of offshore wind capacity. The Project's location has been strategically identified through the Irish Government's Maritime Area Consent process and has been subject to extensive surveys and assessments to date. If the Project does not proceed, a significant area of the seabed already identified by the Irish Government as suitable in principle in the Offshore Renewable Energy Development Plan (OREDP) and made available for large-scale offshore wind development, would not be developed in the near-term, if at all. This could result in complications for all future phases of offshore wind developments in Ireland. Ireland will not meet its target for 5 GW of offshore wind energy by 2030 if the Project does not proceed.

If the Project doesn't proceed, the opportunity to capture the available renewable energy resource and connect it to Ireland's electricity grid would be lost, as would the opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions.

The opportunity to generate local employment and investment would also be lost. It is likely that the trends of low population density, aging population dynamics and rural deprivation that have been recorded within the Population Study Area would continue in the absence of investment, as discussed in Chapter 6 of this EIAR on Population and Human Health. Overall, the potential impact of this is considered to be long term, negative and slight.

The existing sea and land uses can and will continue in conjunction with the Project. A comparison of the potential environmental effects of the 'Do-Nothing' Alternative when compared against the chosen option of developing a renewable energy project at this site are presented in Table 3-1 below.

Table 3-1 Comparison of environmental effects when compared against the chosen option of developing a renewable energy project

Environmental Consideration	Do Nothing Alternative	Chosen option of developing a renewable energy project
Offshore Site		
Population & Human Health	No increase in local employment and no long-term financial contributions towards the local community.	Up to approximately 1080 full time jobs could be created annually during the construction, operation, and maintenance and decommissioning phases of the Project. Positive impact from investment and Community benefit Fund. Based on the assessment detailed in Chapter 19, there will be no significant

Environmental Consideration	Do Nothing Alternative	Chosen option of developing a renewable energy project
	No potential for noise to affect sensitive receptors.	health effects on sensitive receptors from the Project.
Marine Physical Processes	No change to existing metocean and physical processes within the marine environment.	The Offshore Site (including the siting of WTGs and volume and nature of offshore export cable protection proposed) has been designed in consideration of reducing potential impacts to marine physical processes. Installation of hard substrate (e.g. rock placement) will be avoided or minimised where possible to mitigate effects of wave and current blockage. Based on the assessment detailed in Chapter 7: Marine Physical Processes, there will be no significant effects on marine physical processes as a result of any phase of Project development.
Water & Sediment Quality	No change to existing water and sediment quality within the marine environment. No potential for impacts to designated water bodies.	The Offshore Site has been selected in consideration of water and sediment quality receptors within the marine environment, with Project infrastructure designed to reduce any potential impacts on water and sediment quality receptors (including designated waterbodies). Very low levels of contamination were detected in water and sediment samples across the Offshore Site, and any effects from the Construction, Operation & Maintenance and Decommissioning phases of the Project will be effectively mitigated. Based on the assessment detailed in Chapter 8: Water and Sediment Quality, there will be no significant effects on water and sediment quality as a result of any phase of Project development.
Benthic Ecology	No change to the existing benthic community structure or distribution within the marine environment. No potential for impacts to benthic habitats and species afforded protection under national and European law.	The Offshore Site and the siting of Project infrastructure (including WTGs and the OEC) has been chosen in consideration of the spatial distribution of sensitive benthic communities within the marine environment. This includes cable routeing taking into account sensitive features such as maerl beds and sensitive reef habitat. Based on the assessment detailed in Chapter 9: Benthic Ecology, there will be

Environmental Consideration	Do Nothing Alternative	Chosen option of developing a renewable energy project
		no significant effects on benthic ecology as a result of any phase of Project development.
Fish & Shellfish Ecology	No change to the existing structure or distribution of fish and shellfish species within the marine environment. No potential for impacts to fish and shellfish species of national and international commercial or conservation importance.	The Offshore Site and the siting of Project infrastructure has been chosen in consideration of the spatial distribution of sensitive and commercially valuable fish and shellfish species within the marine environment. The fish and shellfish community across the Offshore Site is generally representative of the wider west Irish coast and north-east Atlantic. Based on the assessment detailed in Chapter 10: Fish and Shellfish Ecology, there will be no significant effects on fish and shellfish ecology as a result of any phase of Project development.
Marine Ornithology	No change to the existing structure or distribution of marine bird communities. No potential for impacts of marine bird species or communities afforded protection under national and European law.	The OAA has been designed in consideration of marine ornithology usage of the Offshore Site. WTG dimensions (including tower height, rotor diameter and air gap) have been chosen to reduce the potential for displacement and barrier effects to marine ornithology receptors. Based on the assessment detailed in Chapter 11: Marine Ornithology, there will be no significant effects on marine ornithology as a result of any phase of Project development.
Marine Mammals & Other Megafauna	No change to the structure and distribution of marine mammal and other megafauna communities within the marine environment. No potential for impacts to marine mammal and other megafauna species or communities afforded protection under national and European law.	The Project has been designed to reduce potential impacts to marine mammals and other megafauna, including siting of WTGs to allow animals to pass through the OAA. The use of gravity base structures, avoiding the use of impact pile driving for foundation installation will result in comparatively low sound emissions in the marine environment. Based on the assessment detailed in Chapter 12: Marine Mammals and Other Megafauna, there will be no significant effects on marine mammals and other megafauna as a result of any phase of Project development.

Environmental Consideration	Do Nothing Alternative	Chosen option of developing a renewable energy project
Commercial Fisheries	No change to existing commercial fisheries operations within the marine environment, including no change to fishing ground and catch availability.	The Project has been designed in consideration of existing commercial fisheries operations throughout the Offshore Site, including siting WTGs to allow safe passage of vessels throughout the OAA and reducing the use of export cable protection (i.e., rock placement) as far as practicable along the length of the ECR. The Offshore Site avoids the main prawn (*Nephrops*) trawling grounds in the region, which lie to the west of the OECC. Based on the assessment detailed in Chapter 13: Commercial Fisheries, there will be no significant effects on commercial fisheries as a result of any phase of Project development.
Shipping & Navigation	No change to existing shipping and navigation operations within the marine environment, including no change to existing commercial and/or recreational vessel activities.	The Project has been designed in consideration of existing shipping and navigation operations throughout the Offshore Site, including siting WTGs to allow safe passage of vessels throughout the OAA and reducing the use of export cable protection (i.e., rock placement) as far as practicable along the length of the OEC. Based on the assessment detailed in Chapter 14: Shipping and Navigation, there will be no significant effects on shipping and navigation as a result of any phase of Project development.
Civil & Military Aviation	No change to existing civil and military aviation operations within the marine environment.	The Project has been designed in consideration of civil and military aviation activities across the Offshore Site. A Lighting and Marking Plan has been developed for structures within the Offshore Site. Based on the assessment detailed in Chapter 15: Civil and Military Aviation, there will be no significant effects on civil and military aviation as a result of any phase of Project development.
SLVIA	Neutral.	Given the distance of the OAA from the coastline, any potential visual impacts to onshore receptors will be limited.

Environmental Consideration	Do Nothing Alternative	Chosen option of developing a renewable energy project
		Based on the assessment detailed in Chapter 16: SLVIA, the Seascape within approximately 10km of the OAA, and two of the visual receptors within this distance are deemed to incur significant effects, with the remaining being not significant.
Marine Archaeology & Cultural Heritage	No change to the existing siting or condition of marine archaeology or cultural heritage assets. No potential for impacts to marine archaeology or cultural heritage assets afforded protection under national and international heritage conservation directives.	The Offshore Site has been selected in consideration of marine archaeology and cultural heritage assets. The siting of WTGs and the OEC have been chosen to avoid, as far as practicable, direct and indirect impacts to marine archaeology and cultural heritage assets. Based on the assessment detailed in Chapter 17: Marine Archaeology & Cultural Heritage, there will be no significant effects on marine archaeology and cultural heritage assets.
Other Users of the Marine Environment	No change to existing activities of other users of the marine environment.	The Offshore Site has been designed in consideration of existing activities of other users of the marine environment. Based on the assessment detailed in Chapter 18: Other Users of the Marine Environment, there will be no significant effects on other users of the marine environment as a result of any phase of Project development.
Offshore Air Quality & Airborne Noise	No potential for changes in offshore air quality or airborne noise.	Given the distance of the OAA from the coastline any potential impacts from offshore air quality and airborne noise will be extremely limited or imperceptible from the coastline. Based on the assessment detailed in Chapter 19: Offshore Air Quality & Airborne Noise, there will be no significant effects on offshore air quality and airborne noise as a result of any phase of Project development.
Onshore Site		
Population & Human Health	No increase in local employment and no	Up to approximately 1080 full time jobs could be created annually during the

Environmental Consideration	Do Nothing Alternative	Chosen option of developing a renewable energy project
	long-term financial contributions towards the local community. No potential for noise, dust, to affect sensitive receptors.	construction, operation, and maintenance and decommissioning phases of the Project. Based on the assessment detailed in Chapter 6 and the mitigation measures proposed, there will be no significant effects on population and human health.
Terrestrial Biodiversity (including Birds)	No habitat loss. No change to the existing structure or distribution of terrestrial bird communities. No potential for impacts of bird species or communities afforded protection under national and European law.	The development has been designed to avoid or mitigate impacts on biodiversity and birds. There is unlikely to be any significant effects on terrestrial biodiversity and birds resulting from the Onshore Site.
Land, Soils & Geology	Neutral	There is no loss of peat, subsoil or bedrock as a result of the Onshore Site. Peat, subsoil and bedrock will be relocated within the site. No significant effects on land, soils and geology.
Water	Neutral	No significant effects on surface water or groundwater quality will occur.
Air Quality	Will not provide the opportunity for an overall increase in air quality or reduction of greenhouse gasses.	The Project will provide an alternative to electricity generated from fossil fuel sources and will result in a long-term, moderate, positive impact on air quality.
Climate	Will not assist in achieving the renewable energy targets set out in the Climate Action Plan.	Over the proposed 38-year lifetime of the Project, approximately 462,196 tonnes of carbon dioxide will be displaced from traditional carbon-based electricity generation and will result in a long-term significant positive impact on climate.
Noise & Vibration	No potential for noise impacts on nearby sensitive receptors.	There will be a short-term imperceptible negative residual impact due to an increase in noise levels during the construction phase of the Onshore Site. However, when considering mitigation, no significant noise and vibration residual effects are predicted during the

Environmental Consideration	Do Nothing Alternative	Chosen option of developing a renewable energy project
		construction or operational phases of the Project.
Landscape & Visual	No potential for landscape and visual impacts on nearby sensitive receptors.	The limited visibility of the Onshore Site within the landscape and the proposed landscaping will mitigate any potential for significant landscape and visual effects.
Archaeology & Cultural Heritage	No potential for impacts on unrecorded, subsurface archaeology.	No residual direct impacts or direct cumulative impacts as a result of the Onshore Site will occur. All potential direct effects are dealt with through mitigation to alleviate or remove the impacts. No significant effects on archaeology & cultural heritage
Material Assets	Neutral	There is the potential for effects on material assets during the construction phase of the Onshore Site, in particular existing services such as electricity, gas networks, water and wastewater infrastructure, etc, as well as the existing Moneypoint Power Station, Co. Clare. However, when considering mitigation, no significant residual effects are predicted to occur on existing material assets.
Traffic	Neutral	There will be short term negative imperceptible to slight impact on traffic volumes during the construction phase of the Onshore Site. A Traffic Management Plan incorporating all the mitigation measures has been developed to minimise impacts on local traffic. There will be no significant effects on existing traffic and transport.
Vulnerability of the Project to Natural Disasters	No potential to be affected by or to cause major accidents or natural disasters	As demonstrated in Chapter 31, the risk of a major accident and/or disaster during the construction of the Project is considered 'low' in accordance with the 'Guide to Risk Assessment in Major Emergency Management' (DoEHLG, 2010). The Project will be designed and built in accordance with current best practice and, as such, mitigation against the risk of major accidents and/or disasters will be embedded through the design. With the implementation of all mitigation measures detailed in the EIAR, there will not be significant residual effects associated with

Environmental Consideration	Do Nothing Alternative	Chosen option of developing a renewable energy project
		the construction, operation and maintenance, and decommissioning of the Project.

3.2.3 Alternative Site Locations

In the case of this Project the OREDP in 2014 identified Assessment Area 5 – West Coast, within which the Project located, as having the capacity to accommodate 500MW of fixed bottom offshore wind energy without likely significant adverse effect on the environment. The site was designated pursuant to the OREDP Assessment Area 5 and the MAC. The below sections detail the Foreshore Licence/Lease Applications and the subsequent Maritime Area Consent (MAC). Based on the below, the Applicant did not have other options to consider for an offshore wind farm location.

3.2.3.1 Foreshore Licence/Lease Applications

In October 2001, a foreshore licence application (Reference Deed Number 016/02) was submitted to the then Minister for the Marine and Natural Resources. The licence was granted "for the purpose of testing the suitability of the foreshore for the construction and operation of a wind powered electricity generating station". An extension on the period of the foreshore licence was granted in May 2007, which extended the validity of the licence to May 2008.

In May 2008, a foreshore lease application (Reference FS006461) was submitted to the then Foreshore Unit in the Department of Housing, Local Government and Heritage to occupy an area at Sceirde (Skerd) Rocks, County Galway. The lease application sought to provide for up to 20 turbines with a rotor diameter of up to 120m, on a monopile foundation. An Environmental Impact Statement (EIS) was prepared which accompanied the lease application.

In 2022, an ORE investigative foreshore licence application (Reference FS007161) was submitted to the Department of Environment, Climate and Communications to undertake site investigations within the offshore array area.

Also in 2022, an ORE investigative foreshore licence application (Reference FS007543) was submitted to the Department of Environment, Climate and Communications to undertake site investigations within the OECC. These licences were granted in September 2023.

Relevant Project Status

In 2019, the Marine Planning and Development Management Bill (MPDM) was published setting out the transitional protocol. Within the bill, Relevant Projects to which this Transitional Protocol applied were set out as;

a) offshore wind projects which applied for (and substantially advanced) or were granted a lease under the Foreshore Act 1933, as amended (the Foreshore Act) in respect of which material changes are proposed to that which was originally applied for and assessed under the Foreshore Acts, which changes require further assessment; and / or
b) offshore wind projects which have a valid connection agreement from the TSO or are confirmed by the TSO as eligible to be processed to receive a valid connection offer.

Given the history of the development, it was awarded a "Relevant Project" status and was therefore eligible to progress with a Maritime Area Consent Application (MAC) and a Grid Connection Assessment (GCA).

Maritime Area Consent

The Project was granted a MAC, (Reference 2022-MAC-007) by the Minister for Environment, Climate and Communications in December 2022, which covers the original Foreshore Lease application area. In May 2024, amendment A.1, was granted to the original MAC which provides for an extension of the date by which the application for development permission should be submitted. In June 2024, Amendment B.1, was granted to the original MAC which sought to increase the Array Area for the project. In December 2024, Amendment C.1, was granted to the original MAC and provides for a further extension of the date by which the application for development permission should be submitted.

3.2.3.2 Suitability of the Offshore Site

Offshore wind farms are considered to be more efficient than onshore developments, due to higher wind speeds that exist offshore, which results in an increased electricity generation capacity. As such, due to the increased capacity factor available for offshore wind farms, significantly fewer turbines are needed to produce the same amount of energy as an onshore wind farm. Offshore WTG's do not have to contend with the physical barriers that can interrupt wind flow on land. The larger turbine technology that can be deployed offshore, combined with a more consistent and sustained wind resource, results in the production of a sustainable low-carbon renewable energy, whilst ensuring that the Project can achieve its aims set out in Section 3.2.2 above. Offshore Wind Farms also have reduced impacts associated with noise, shadow flicker and visual impacts which are key concerns for communities associated with Onshore Wind Farms.

The cost of building each megawatt of electricity-generating capacity in an offshore wind farm is in the region of €3 million. It is therefore critical that the most suitable site for the Project was chosen.

From an early stage in the design process, it was considered optimal to seek an offshore site capable of accommodating several turbines within reasonable proximity to each other. This would limit the geographical spread of the turbines and consolidate supporting infrastructure (i.e. fixed-bottom foundations, inter-array cabling etc.). The provision of a centralised location would concentrate the necessary infrastructure into a single geographic area.

3.2.3.2.1 Initial Screening

Prior to the Project being designated as a Relevant project, site suitability studies for the potential development of offshore wind farms on Ireland's west coast were undertaken. The following sites were studied as part of this site selection exercise:

- Tralee Bay, Co. Kerry
- Shannon Estuary
- Kilkee, Co. Clare
- Galway Bay, Co. Galway
- Killala, Co. Mayo
- Clew Bay, Co. Mayo
- Achill, Co. Mayo
- An Daingean (Dingle Bay), Co. Kerry
- Donegal Bay, Co. Donegal
- Outer Galway Bay

Each of the above sites were studied using the following criteria, and in cases where a site failed to meet one or more of the criteria, the site was no longer investigated:

- Distance from the shoreline of 5km or more;

- Areas with water depth of up to 60m were considered to facilitate fixed-bottom foundations;
- Avoidance of environmentally sensitive areas including Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Natural Heritage Areas (NHAs);
- Consideration of other sea users, including shipping activity and commercial fisheries;
- Suitable options available for connecting to the national grid.

In cases where a site was ruled out due to failure to meet one of the criteria, the site was no longer investigated.

Following the initial screening study, it was considered that the Outer Galway Bay area, northwest of Oileain Árainn (Aran Islands) would be brough forward for further assessment. Seven sites within an area northeast of the Aran Islands were considered, listed below:

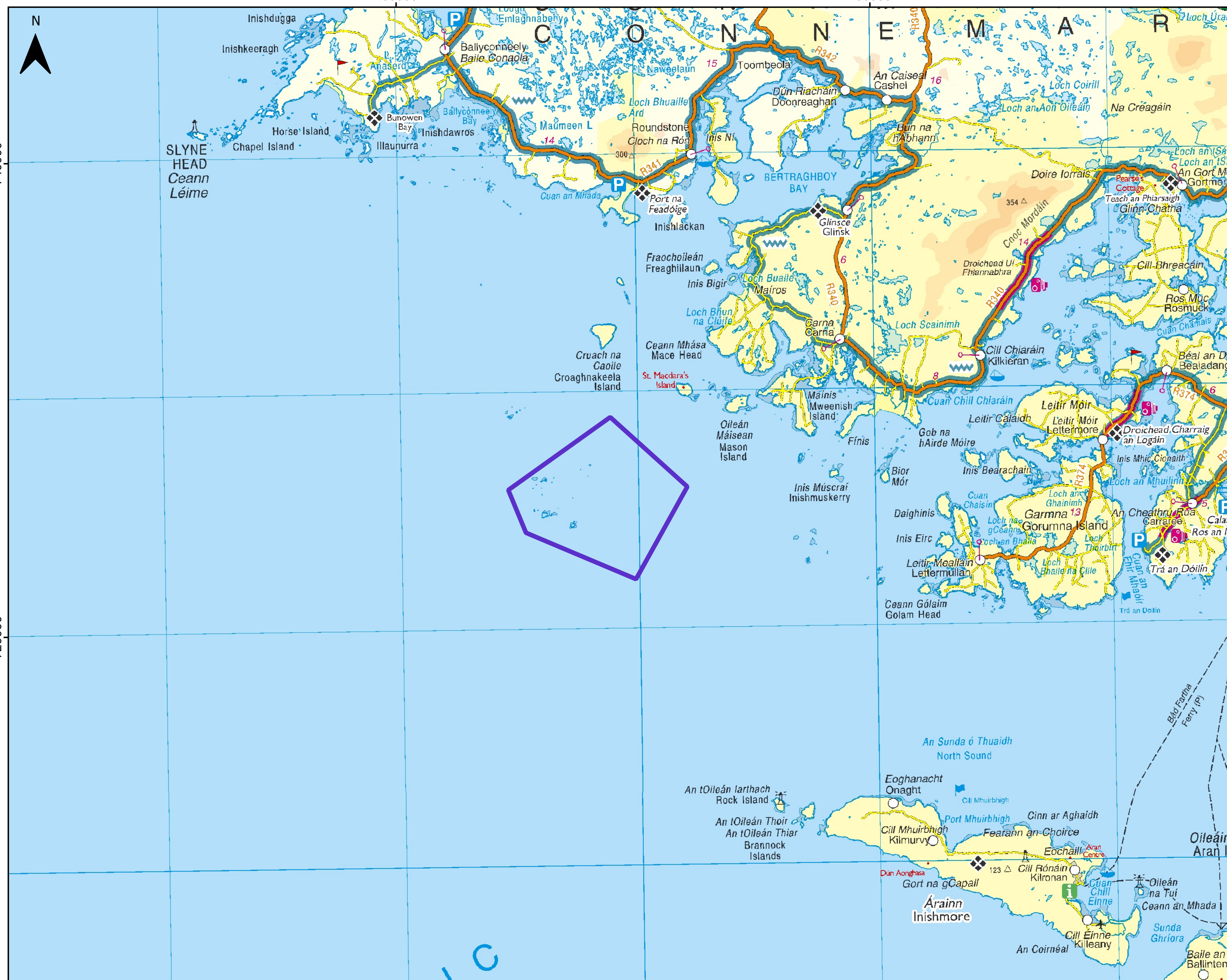
- Na Foiriun, these islands are part of the Carraige Meacain (Namackan rocks);
- Carraig Míle (Mile Rocks);
- Carraig na hEilite (Seal Rock);
- Carraig Iorla (Eagle Rock);
- Leac Dhearg (Red Flag)
- Maol an Éisc (Fish Rock)
- The Sceirde Rocks including Dúleac (Doolick)

Following studies of the above sites, the Sceirde Rocks area was selected as the most suitable location for an offshore wind farm due to its favourable site characteristics and location between 5 km and 11.5 km from the coast. The site provides an excellent wind resource with favourable metocean conditions due to the Sceirde Rocks themselves providing shelter from Atlantic waves and tidal streams, and with water depths suitable for developing a fixed foundation offshore wind farm.

3.2.3.2.2 *Site Selection Process*

Following initial screening the Sceirde Rocks area (Figure 3-1) to the west of Galway Bay, Co. Galway, was the preferred area of interest for the Project. Due to the scale of the area selected, there was a requirement to undertake additional investigations as a means to determine a specific location for the Project. This led to the selection of the Foreshore Licence Area.

SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde



LEGEND

Foreshore Lease Area (2008)

0 1 2 NM
0 2 4 km

Data Source

PROJECT TITLE
Sceirde Rocks

MAP TITLE
Sceirde Rocks Area

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-15	KB	ÓM

DRAWING NO
Figure 3-1

SCALE	PAPER SIZE	DATUM	PROJECTION
1:200,000	A4	WGS84	UTM 29N

A foreshore licence was granted to Fuinneamh Sceirde Teo (FST) for site investigations in 2002 and this was subsequently extended in 2007 (to May 2008). A second foreshore licence application was submitted in 2008. Two further foreshore licence applications for site investigations were submitted in 2022 which covered new areas not surveyed under previous licences. These licences were granted in 2023.

The site selection and layout process has balanced several key development sensitivities including requirements under FST's MAC, Wind Turbine Generator (WTG) model choice, WTG spacing arrangements and wind speed/direction, geophysical characteristics, metocean conditions, benthic habitats, foundation structure (and associated supporting structures) and navigational safety considerations. The following sections detail the additional surveys and considerations that have been ongoing as part of the site selection process.

- Benthic Ecology
- Metocean
- Geotechnical investigation surveys
- Bathymetric and geophysical surveys

The outcome of these investigative surveys assisted in confirming the suitability of the location for an offshore wind farm and allowed for the focused determination of a preferred site within the wider Foreshore Licence Areas. The below table summarises the surveys in relation to the Sceirde Rocks area.

Table 3-2 Site Investigation Summary

Survey	Criteria	Summary
Benthic Ecology	Sensitive seabed habitats to be avoided, where possible	Benthic surveys identified some sensitive features, such as pink sea fan (*Eunicella verrucosa*) and maerl. Through analysis of these data, WTG locations and inter-array cable (IAC) routes could be selected to avoid impacts on these most sensitive features.
Metocean	Shelter from high wave loads	Wave heights in deeper water to the SW of the Foreshore Licence area could pose construction challenges, therefore these areas could be avoided with preference for the OAA to be situated over the shallower shelf.
Geotechnical Investigation Surveys	Suitable substrate for WTG foundation placement and cable installation	Geotechnical data obtained during site surveys determined that piled foundations would not be feasible, therefore geotechnical data informed the Project's selection of gravity-base structure (GBS) foundations to support the deployment of the WTGs. Cable routing studies considered seabed sediment characteristics obtained from geotechnical investigations to identify areas where both IACs and the offshore export cable (OEC) could be buried, thus reducing the requirement for further external cable protection.
Preliminary bathymetric	Water depth and seabed conditions suitable for	A detailed bathymetric study enabled the precise WTG locations to be determined, preferentially

and geophysical	installation of fixed-bottom WTGs supported on GBS fixed bottom foundations	identifying the sediment-filled gullies between the rocky outcrops and ridges which characterise the OAA. Water depths were a constraint whereby construction vessels cannot operate in the shallowest areas within the Foreshore Licence area, and the presence of rocks at or above the sea surface provides a further obstruction in the western part of the Foreshore Licence area. A good understanding of the substrate type, determined through further analysis of geophysical data, was used to better understand site preparation works, i.e. the volume of rock placement that would be required to establish a solid base for the GBS fixed bottom foundations.

The site selection process has been fully informed by national, regional and local policy at a macro level (see Chapter 2: Background and Policy), as well as site-specific factors that influence the turbine layout and project design on site at a micro level (see Section 3.2.5 below). The key policy, planning and environmental considerations for the selection of a potential offshore wind farm site in the Sceirde Rocks area included:

- **Offshore Renewable Energy Development Plan**
- **Planning Policy**: Site location relative to the Galway County Development Plan Renewable Energy Strategy 2024
- **Environmental Sensitivities**: Sufficient area of unconstrained seabed that could potentially accommodate offshore wind farm development and turbine spacing requirements;
- **Designated Sites:** Located outside areas designated for protection of ecological species and habitats;
- **Wind Speeds:** Consistent wind speeds
- **Grid Connection:** Access to the National Grid;

These are further considered below.

Planning Policy

Section 2.5.3, in Chapter 2 of this EIAR sets out in detail the planning policies of the Galway County Development Plan 2022 – 2028, with regard to offshore wind energy development. As the majority of the Offshore Site is within Co. Galway, planning policies for Co. Galway have been considered in this section. However, some of the Offshore Site is in Co. Clare and therefore the Clare County Development Plan 2023 – 2029 has been considered also. As the entirety of the Onshore Site is within Co. Clare, details on the planning policy for Co. Clare are detailed below in Section 3.2.3.2.2 and can be reviewed also in line with the Offshore Site.

The Galway County Development Plan 2022 – 2028 (the GCDP) was adopted by the Elected Members of Galway County Council at the conclusion of the Special Meeting on the 9th of May 2022 and came into effect on the 20th of June 2022. Objectives relating to Climate, Renewable Energy and Marine And Coastal are included in the GCDP and included in Chapter 2, with objectives specifically relevant to this chapter detailed below.

Climate

- **CC1 Climate Change:** Support and facilitate the implementation of European, national and regional objectives for climate adaptation and mitigation taking into account other provisions of the Plan (including those relating to land use planning,

energy, sustainable mobility, flood risk management and drainage) and having regard to the Climate mitigation and adaptation measures.

- **CC2 Transition to a low carbon, climate resilient society:** It is the Council's policy objective to support the transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050, by way of reducing greenhouse gases, increasing renewable energy, and improving energy efficiency.
- **CC5 Climate Adaptation Mitigation:** To promote, support and direct effective climate action policies and objectives that seek to improve climate outcomes across County Galway through the encouragement and integration of appropriate mitigation and adaptation considerations and measures into all development and decision-making processes.
- **CC9 Mainstreaming Climate Change Adaptation:** Galway County Council shall incorporate climate change adaptation into land use planning, building layouts, energy, transport, natural resource management, forestry, agriculture and marine waters.
- **CC10 Green Infrastructure:** Galway County Council shall promote the benefit of open spaces and implement the integration of green infrastructure/networks (e.g. interconnected network of green spaces (including aquatic ecosystems) and other physical features on land) into new development and regeneration proposals in order to mitigate and adapt to climate change.

Renewable Energy

- **RE1 Renewable Energy Generation and ancillary facilities:** To facilitate and support appropriate levels of renewable energy generation and ancillary facilities in the county to meet national, regional and county renewable energy targets, to facilitate a reduction in CO2 emissions and the promotion of a low carbon economy.
- **RE3 Wind Energy Developments**: Promote and facilitate wind farm developments in suitable locations, having regard to areas of the County designated for this purpose in the Local Authority Renewable Energy Strategy. The Planning Authority will assess any planning application proposals for wind energy production in accordance with the Local Authority Renewable Energy Strategy, the Guidelines (or any updated/superseded documents), having due regard to the Habitats Directive and to the detailed policy objectives and Development Standards set out in the Local Authority Renewable Energy Strategy.
- **RE5 Renewable Energy Strategy**: Support and facilitate the sustainable development and the use of appropriate renewable energy resources and associated infrastructure within the County having due regard to the Habitats Directive and to the detailed policy objectives and Development Standards set out in the Local Authority Renewable Energy Strategy as follows:
    - Renewable Energy Transmission
    - Renewable Energy Generation
    - 'Strategic Areas' for renewable energy development
    - Onshore Wind Energy
    - Solar Energy
    - Bioenergy /Anaerobic Digestion
    - Micro-renewables
    - Marine Renewables
    - Hydro Energy
    - Geothermal Energy
    - Alternative Technologies
    - Energy Efficiency & Conservation
    - Sustainable Transport
    - Auto production
    - Battery Storage

- Repowering/Renewing Wind Energy Developments
- Community Ownership

- **RE7 Renewable Energy Generation**: Transition to a Low Carbon Economy: To facilitate and support appropriate levels of renewable energy generation in County Galway, considering the need to transition to a low carbon economy and to reduce dependency on fossil fuels.

Marine And Coastal

NMPF 2 - Marine Planning and Development Management Bill: To support and accommodate any change to the marine spatial planning system which is proposed under the Marine Planning and Development Management Bill 2019 (or any subsequent Bill) once enacted into law.

The GCDP acknowledges that a key national resource to Ireland is the abundance of offshore energy that can be obtained off the Irish coast. The GCDP supports the exploitation of this resource, in line with the NPF, the NMPF and the Offshore Renewable Energy Development Plan. The GCDP includes a supportive marine renewable energy policy objective, which is detailed below:

MRE 1 - Renewable Energy: Support as appropriate, sustainable offshore renewable energy generation off the County Galway coast subject to environmental and amenity considerations.

The GCDP also supports the marine sector as a source of employment and economic growth. The ocean economy is made up of a range of sectors which includes marine renewable energy. The marine economy and the development of offshore energy infrastructure is supported by the following policy objective:

MCE 1 - Maritime Economy: To support development and growth of the maritime economy and balance the competing demands for available space along the coast by different users and encourage co-location and co-existence of activities and infrastructure while having regard to appropriate environmental considerations.

Onshore infrastructure, such as ports and harbours, required to enable the development of the marine economy are identified and supported in the GCDP. Ros an Mhíl port is specifically identified for expansion in order to fully support the development of the marine economy.

Environmental Sensitivities

The Offshore Site was selected so as to avoid overlapping any European Site. However, there are numerous European sites in the vicinity of the Offshore Site. These include SACs for the protection of Annex I seabed habitats; SACs for the protection of marine mammals, and SPAs for the conservation of seabirds, waders and migratory/wintering birds. This includes several Qualifying Interests (QI) which are considered to be highly mobile, such as seabirds and marine mammals, and are likely to occur within the Offshore Site due to their behavioural and foraging ecology.

The Project undertook baseline characterisation surveys, including digital aerial surveys for birds and mammals and a site-specific environmental DNA (eDNA) study. These surveys indicated the presence of several bird and marine mammal species that are qualifying interests of European Sites with connectivity with the Offshore Site, as well as others which are not features of European Sites but are nonetheless of high conservation value.

Site environmental surveys indicate a range of littoral, infralittoral and sublittoral habitat types ranging from bedrock to soft sediments, with a composition generally representative of the range of species and habitats west of Ireland, including algae, reefs with encrusting epifauna, sediments with associated infauna and demersal mobile invertebrates such as crustaceans. The reef-like habitat within the OAA hosts sensitive features including pink sea fan and some small maerl beds, although given the nature of

the rocky habitat across the majority of the OAA the features will be resilient to disturbance due to the oceanographic and metocean conditions in this area. Based on regional survey data as well as the site-specific eDNA study the fish community in the Offshore Site is typical of the wider west of Ireland and NE Atlantic region, with a range of pelagic, demersal and shellfish species present. Commercial fisheries predominantly for crab, lobster and prawns (*Nephrops*) are present in and around the Offshore Site.

Diadromous fish, specifically Atlantic salmon, spawn and live in several rivers around the wider Galway Bay region and are likely to pass through the Offshore Site on route to/from marine feeding grounds. The at-sea movements of salmon (and other diadromous fish) are poorly understood.

Designated Sites

The Sceirde Rocks area is not located within any area designated for ecological protection. The nearest Natura 2000 sites, i.e. Special Area of Conservation (SAC) or Special Protection Area (SPA), to the Sceirde Rocks area are Inishmore Island SAC and Kilkieran Bay and Islands SAC, the boundary of which are located within 5 km of the Sceirde Rocks area at its closest point. The nearest SPA is the Slyne Head To Ardmore Point Islands SPA, the boundary of which is located approximately 3.9 km northeast of the Sceirde Rocks area at its closest point.

The nearest nationally designated site to the Project, i.e. Natural Heritage Area (NHA) or proposed Natural Heritage Area (pNHA) is St. Macdara's Island pNHA, which is located approximately 2.4km northeast of the Sceirde Rocks area at its closest point.

Wind Speeds

Despite the relatively small size of Ireland, mean wind speeds can vary quite considerably across the country in an average year. By convention, the north of the country is windier than the south and western and coastal areas tend to be windier than eastern and inland areas. Areas off the south and west coasts of Ireland have the greatest wind resources as they face the prevailing south-westerly winds unconstrained by land as they arrive at the continental shelf from Atlantic weather systems.

The closest weather station to the Sceirde Rocks area is the Mace Head Automatic Weather Station, situated within the grounds of the University of Galway research centre near Carna, Co. Galway. The station was installed in 2003 and records several weather parameters, including wind speed and direction. According to Met Éireann's historical weather data between 2003 and 2023, the mean monthly wind speed recorded at Mace Head speed ranges from 4.73 m/s to 12.45 m/s, with an overall average of 7.44 m/s. Such wind speeds indicate that the OAA is viable for commercial wind energy development.

An anemometer mast was erected and commissioned on Dúleac (Doolick), Sceirde Rocks in September 2002. The mast recorded wind speed and direction at 20 and 30m above mean astronomical tide. The mean wind speed recorded from the mast from May 2003 to April 2004 was approximately 9m/s. The long-term average wind speed will be a minimum of 9m/s (at the 30m level). Further on-site monitoring of the wind resource was undertaken and has further verified that the wind resource of the site is commercially viable.

Grid Connection

The Project intends to connect to the National Grid via an offshore electrical cabling route along the seabed before reaching landfall along the coast and travelling onshore into an appropriate electrical grid source.

Initially, the project considered connecting into a new onshore 110kV substation in Carna. This substation would then connect into the Screeb Substation which is a 110kV substation. As the project has progressed and given the increased capacity of the project, Screeb as a 110kV substation was no longer a viable option. With the project advancing in later years, it was considered that both the coast of Counties Galway and Clare could be considered an option for an offshore wind farm site as both have 220kV Substations to provide potential grid capacity.

3.2.3.3 Suitability of the Onshore Site

3.2.3.3.1 *Initial Screening*

Once the Sceirde Rocks area was confirmed, an initial review of the west coast was undertaken in order to determine the most appropriate location for a landfall, the most appropriate route for the grid connection as well as a suitable location for the onshore compensation compound.

In 2021, Xodus and MKO undertook a coastal screening assessment, taking into account landfall locations that would be viable for connecting to either Cashla Substation or Moneypoint 220kV Substation. The coastal search targeted sandy beaches to allow for open cut trenching or burial of the cable as well as looking to minimise interaction with areas of rock/ hard substrate, designated sites, other marine infrastructure etc.

A total of 14 areas along the coast were selected and these were considered against the following criteria as show in Figure 3-2 below.

- Technical Constraints (i.e. distance to grid connection, local technical challenges for installation, anticipated seabed conditions, bathymetry etc)
- Designated Nature and Geological Conservation Sites (SAC, SPA, NHA, pNHA)
- Onshore
    - Landscape & Visual Amenity (Local Council Designations)
    - Ecological Constraints
    - Forestry (Ancient & Native Woodland)
    - Proximity to Residential Receptors (<100m)
    - Archaeology and Cultural Heritage (National Monuments and NIAH sites)
    - Hydrology (River and Surface Water Flood Risk)
    - Tourism and Recreation (PRoWs attractions and recreational areas)
    - Land Use
- Offshore
    - Benthic Habitats
    - Marine Archaeology
    - Other Sea Users
    - Commercial Fisheries
    - Aquaculture Sites
    - Shipping and Navigation

Risks were identified along all 14 areas as shown in *Appendix 3-1 – Coastal Screening Process*, and determination of whether there was a potential landfall location was also identified. A total of 8 locations were then selected that would either connect into the Cashla Substation or Moneypoint 220kV Substation, these were:

1. Spidéal Beach
2. Barna Bay Beach
3. Knockauncarragh; and
4. Trácht Beach
5. Crag

6. Fintra Beg Beach
7. White Strand to Doonbeg Beach
8. Ballymacrinan

In 2021, Eirgrid undertook a Grid Connection Assessment for the Offshore Phase 1 projects. Within the report published by EirGrid, two connection options were considered for the Sceirde Rocks project, the Cashla 220kV Substation in Galway and the Moneypoint 220kV Substation in Clare. Within their report Eirgrid noted that neither option presented a need for significant deep reinforcement works and both options presented relatively equal challenges in deliverability. In 2022, the Project contracted TNEI to undertake a network constraint study which considered both Cashla and Moneypoint in more detail and their suitability as a connection point for the project. The outcome of the assessment highlighted Moneypoint as the preferable option from an electrical network constraints assessment.

After further analysis, using criteria to assess site constraints (both onshore and offshore) at each potential landfall location, the options for connecting into Cashla Substation were discounted. These options all posed higher technical and environmental risks than the landfall options for connection into Moneypoint Power Station. Accessing Cashla Substation via Galway Bay meant the cable route could impact on the Galway Bay Complex SAC. In addition to this, the area surrounding the Cashla Substation, and through the suburbs of Galway City, had a much heavier population density along with the need to cross the M6 Motorway which could impact on traffic disruption during the cable installation. Additional risks associated with the Cashla Substation landfall locations include the additional total cable length required, presence of natural geohazards, overlap with Annex I habitats, overlap with nursery grounds for several marine species, overlap with shellfish production areas and commercial fishing activities. The onshore risks associated with the Cashla Substations landfall locations include the large length of onshore cabling required, overlap with Designated Sites and Article 17 habitats, technical and environmental challenges associated with cable route travelling through or near Galway City and the Corrib River, and potential landscape and public amenity impacts.

Following the initial coastal screening, four potential landfall locations for connection into Moneypoint 220kV Substation were taken forward in the feasibility process and considered in further detail as potential landfall locations.

In addition, an onshore grid connection route feasibility study was completed by MKO to determine a connection route from the 4 landfall options to Moneypoint 220kV Substation. Risks were identified along all onshore grid connection route options, be it within the road network or cross country within third-party lands, as shown in *Appendix 3-2 – Grid Connection Route Feasibility.*

Further information on the chosen landfall location and subsequent onshore grid connection options are provided in Section 3.2.5.2.1 and 3.2.5.2.2 below.

440000
480000
520000
720000
680000
N
1
2
3
4
5
6
7
8
9
10
11
12
13
14
COUNTY CLARE
COUNTY LIMERICK

SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

Coastal Overall Combined Risk

- High
- Moderate

0 5 10 NM

0 10 20 km

PROJECT TITLE

Sceirde Rocks

MAP TITLE

Coastal Screening

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-15	CF	OM

DRAWING NO

Figure 3-2

SCALE	PAPER SIZE	DATUM	PROJECTION
1:460,000	A4	WGS 84	UTM 29N

3.2.3.3.2 *Site Selection Process*

As with the Offshore Site, the layout and design for the Onshore Site was an iterative process which took account of site constraints and the distances to be maintained between various infrastructure elements, watercourses, etc. For the purposes of selecting the Onshore Site, an Onshore Study Area was determined based on the results of the coastal screening and chosen connection into Moneypoint 220kV substation, as shown in Figure 3-3 below.

The design of the Onshore Site was constraints-led, thereby avoiding the most environmentally sensitive parts of the site. Constraints are restrictions that inform the design of a project by highlighting onsite sensitivities and providing appropriate setback buffers. The design of the Onshore Site has also been an informed and collaborative process from the outset, involving the designers, Applicants, engineers, landowners, environmental, ecological, hydrological, geotechnical, and archaeological specialists and traffic consultants. The aim was to reduce the potential for environmental effects while designing a project capable of being constructed that is also economically viable.

The key policy, planning and environmental considerations on review of the onshore area included:

- **Planning Policy**: Site location relative to the Clare County Development Plan 2023 – 2029,
- **Designated Sites:** Located outside areas designated for protection of ecological species and habitats;
- **Low population density**; and
- **Grid Connection:** Access to the National Grid.

As information regarding the site of the Project was compiled and assessed, the proposed layout has been revised and amended to take account of the physical constraints of the site and the requirement for environmental buffer zones and other areas in which infrastructure could not be located. The design process has also taken account of the recommendations and comments of the relevant statutory and non-statutory consultees and local authorities, as detailed in Sections 2.7 of Chapter 2.

The location of the Onshore Site was primarily driven by determining most suitable option for the Project to connect to the national grid. Once this was determined, the design process centred on the most suitable locations for the Onshore Site infrastructure to facilitate the grid connection. Further detail on this is detailed in Section 3.5.2.1 below.

480000
540000
600000
720000
660000
N
Co. Galway
Co. Clare
HESKMORE
DUVET
0
10
20 km

SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

County Border
- County Clare
- County Galway

Data Source

PROJECT TITLE
Sceirde Rocks

MAP TITLE
Onshore Study Area

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-15	KB	ÓM

DRAWING NO
Figure 3-3

SCALE	PAPER SIZE	DATUM	PROJECTION
1:650,000	A4	IRENET95	Transverse Mercator

Planning Policy

Clare County Council Development Plan 2023 – 2029

The Clare County Development Plan 2023 – 2029 (CCDP) was formally adopted by Elected Members of Clare County Council on 9th March 2023. The CCDP officially came into effect on 20th April 2023, 6 weeks later. The CCDP provides overall guidance for the proper planning and development of County Clare through policies and objectives.

The CCDP recognises its position in supporting the delivery of meaningful action on climate change. Climate action is thus an important strategic objective of the CDP, with aims to achieve decarbonisation and climate resilience as a county. This has been reflected in Chapter 2 - Climate Action, in addition to other climate action and renewable energy related objectives introduced throughout the Plan.

The significance of climate change and the need for continued support / investment within renewable energy generation as part of the county's adaption strategy is captured within the strategic role of the CDP's Climate Action Chapter:

> *Goal II: A county that is resilient to climate change, plans for and adapts to climate change and flood risk, is the national leader in renewable energy generation, facilitates a low carbon future, supports energy efficiency and conservation and enables the decarbonisation of our lifestyles and economy.*

Objectives relating to Climate, Energy Supply, Renewable Energy and Marine and Coastal are included in the CCDP and included in Chapter 2, with objectives specifically relevant to this chapter detailed below.

Climate

CDP2.1 Climate Action:

It is an objective of Clare County Council:

a) To support the implementation of the National Climate Action Plan 2023 and the National Climate Change Adaptation Framework (and any subsequent versions thereof), and to work with the Regional Climate Action Offices to enable County Clare to transition to a low carbon and climate resilient county.
b) To adopt sustainable planning strategies through integrating land use and transportation and by facilitating mixed use developments as a means of supporting national targets of climate policy mitigation and adaptation objectives, and reducing our carbon footprint and greenhouse gas emissions; and
c) To raise awareness and understanding of the impacts of climate change on both the local economy and communities in the county, and the ways communities can increase their response and grow their resilience to these impacts.

CDP2.2 Climate Change Mitigation, Adaption and resilience

It is an objective of the Clare County Council:

a) To support the implementation of the Clare Climate Change Adaptation Strategy 2019-2024 (and any subsequent versions);
b) To promote measures that build resilience to climate change to address impact reduction, adaptive capacity, awareness raising, providing for nature-based solutions and emergency planning;

c) To raise awareness of issues relating to climate change and climate change adaptation during the lifetime of this plan;
d) To liaise, collaborate and work in partnership with the relevant government approved sectors in relation to initiatives and activities across the county;
e) To support the Ennis 2040 Spatial and Economic Strategy and its aspiration for Ennis to become Irelands first climate adaptive town; and
f) To facilitate and support the relevant stakeholders and enterprises in the progression of advancements in climate adaptation solutions and renewable energy generation and technologies.

Energy Supply

The CCDP acknowledges the strengths of the energy network in County Clare and envisions the County accommodating significant further generating activity. The economic benefits of the expansion of the renewable energy sector are recognised, with the redevelopment of Moneypoint power station earmarked as a focal point for the development of the offshore wind energy industry. The council's policy in relation to the energy supply, energy security and the development of Moneypoint are outlined below:

- **Energy Supply CDP6.17**

It is an objective of Clare County Council:

a) To contribute to the economic development and enhanced employment opportunities in the county by:
   i. Enabling the development of a self-sustaining, secure, reliable and efficient renewable energy supply and storage for the County in line with CDP Objective 3.3;
   ii. Facilitating the county to become a leader in the production of sustainable and renewable energy for national and international consumption through research, technology development and innovation; and
   iii. Supporting on-land and off-shore renewable energy production by a range of appropriate technologies in line with CDP Objective 3.3.

- **Energy Security CDP11.44.**

It is an objective of Clare County Council:

To promote and facilitate the sustainable development, maintenance and upgrading of electricity and gas network grid infrastructure, to integrate renewable energy sources, thereby creating a secure and efficient energy supply and storage system for County Clare which is ready to meet increased demand as the regional economy grows.

- **Strategic Development Location B – Moneypoint CDP12.6**

It is an objective of Clare County Council:

b) To support the redevelopment of the Moneypoint power generation station site as a green energy hub and the development of the Shannon Estuary as a focal point for the offshore wind industry in Europe.
c) To support and facilitate the development of marine related industry on lands adjacent to Moneypoint which is compatible with the primary use of the SDL as a Strategic Energy Location.

Renewable Energy

- **CDP 11.47 Renewable Energy**

It is an objective of the Development Plan:

a) To encourage and to favourably consider proposals for renewable energy developments, including community owned developments, and ancillary facilities in order to meet National, Regional and County renewable energy targets, and to facilitate a reduction in CO2 emissions and the promotion of a low carbon economy;
b) To assess future renewable energy-related development proposals having regard to the Clare Renewable Energy Strategy 2023-2030 in Volume 5 of this plan and associated SEA and AA;
c) To support the sustainable development of renewable wind energy (on-shore and offshore) at appropriate locations and of its related grid infrastructure in County Clare, in accordance with all relevant policies, guidance and guidelines pertaining to the protection of the environment and protected habitats and species, and to assess proposals having regard to the Clare Wind Energy Strategy in Volume 6 of this plan and the associated SEA and AA, or any subsequent updated adopted Strategy and to national Wind Energy Guidelines;
e) To strike an appropriate balance between facilitating renewable and wind energy-related development and protecting the residential amenities of neighbouring properties;
g) To support the integration of indigenous renewable energy production and grid injection;
h) To ensure that all proposals for renewable energy developments and ancillary facilities in the County are in full compliance with the requirements of the SEA and Habitats Directives and Objective CDP3.3 of this plan; and
i) To promote and market the County as a leader of renewable energy provision.

Marine and Coastal

- **Maritime Spatial Planning CDP13.3**

It is an objective of the Development Plan:

a) To ensure consistency and alignment between land based spatial planning and marine planning which supports the protection of the marine environment and the growth of the marine economy;
b) To support appropriate land-based infrastructure which facilitates marine activity (and vice versa).
c) To support proposals for appropriate infrastructure that facilitates the diversification or regeneration of marine industries.

The Project is further supported by policy *CDP 13.5* which supports offshore wind energy developments and their associated land-based infrastructure and service requirements, subject to environmental considerations.

- **Offshore Renewable Energy (ORE) Development CDP 13.5**

It is an objective of Clare County Council:

a) To support offshore wind, wave and tidal renewable energy developments and the ancillary land-based infrastructure and service requirements to assist in meeting renewable energy targets subject to environmental considerations and the protection of the amenities of the surrounding areas in accordance with the Offshore Renewable Energy Development Plan (OREDP), the ORE Planning policies as outlined in the National Marine Planning Framework (NMPF) and SIFP SEA Environmental Reports and the Natura Impact Reports; and

b) To support the redevelopment of the Moneypoint power generation station site as a green energy hub and the development of the Shannon Estuary as a focal point for the offshore wind industry in Europe.

The CCDP supports and facilitates the development of the electricity network, particularly projects connecting renewable energy sources to the national grid.

Designated Sites

The Onshore Study Area site is not located within any area designated for ecological protection.

The nearest Natura 2000 site to the Onshore Study Area, i.e. Special Area of Conservation (SAC) or Special Protection Area (SPA) is Tullaher Lough and Bog SAC, the boundary of which is located adjacent to the L20301 local road network where cabling will be laid. Tullaher Lough and Bog SAC qualifying interests relate to terrestrial habitats (bogs).

Other Natura 2000 sites in close proximity to the Onshore Study Area include the Carrowmore Dunes SAC, located approximately 1.6km east of the potential landfall location at its closest point, Mid-Clare Coast SPA, which is located 920 metres east of the landfall location at its closest point, and Lower River Shannon SAC and Lower River Shannon SAC, both of which are located approximately 585 metres south of the Onshore Compensation Compound at their closest points.

The nearest nationally designated site to the Onshore Study Area i.e. Natural Heritage Area (NHA) or proposed Natural Heritage Area (pNHA) is Tullaher Lough and Bog pNHA, which as mentioned above, lies adjacent to the local road network.

Low population density

The Applicant also sought to identify an area with a relatively low population density, in particular for the routing of an onshore gird connection. Having reviewed the settlement patterns in the Onshore Study Area, determination whether an area was densely or sparsely populated was considered. There are multiple areas within the Onshore Site that are densely populated, for example, near Kinvarra, or where populations are sparse, i.e. south Clare near Doonbeg, where local road networks avoid towns and large populations. All this is considered when trying to understand the most appropriate location for routing an onshore grid connection.

Grid Connection

The Project intends to connect to the National Grid via an onshore grid connection. Coming ashore in Co. Clare, there are available options for connection into Moneypoint 220kV Substation.

3.2.3.3.3 *Permitting and Consent History*

The Onshore Site, as detailed in Chapter 1, Section 1.1.2, has been subject to previous planning applications as detailed in Chapter 2, Section 2.6.2. To date, planning applications in the surrounding area relate to one-off housing, onshore wind farms, electrical infrastructure as well as ancillary and electrical infrastructure and works within the Moneypoint 220kV Substation. None of these applications relate to the Onshore Site.

3.2.4 Alternative Renewable Energy Technologies

Both onshore and offshore wind and solar energy development will be required to ensure that Ireland reaches the target set in the Climate Action Plan 2024 to source 80% of our electricity from renewable

energy by 2030. It is not a case of 'either' 'or'. When considering other renewable energy technologies in the area, the Applicant considered other forms of offshore renewable energy, as well as onshore wind and commercial solar energy production as an alternative to the Project.

3.2.4.1 Onshore Wind

Although the screening exercise was based on identifying a site for offshore wind development; another alternative source of renewable electricity generation would be onshore wind energy.

Fuinneamh Sceirde Teoranta is an associated company of Corio Generation, a globally leading offshore wind Applicant that works in established and emerging markets, dedicated to harnessing renewable energy from the sea. Corio Generation has a project pipeline of over 30 GW, which is one of the world's largest offshore wind project pipelines. It is considered that a combination of both onshore and offshore wind farm development will continue to be required to deliver on the ambitious renewable energy targets set under the Climate Action Plan (CAP) 2024. Wind speeds are generally higher offshore than onshore. This coupled with lower wind shear and lower turbulence means that turbines located offshore generally have higher energy outputs. To date, in Ireland, while some developers have explored potential developments offshore, most have remained focused on developing onshore wind as their primary objective due to the policy being in place to submit planning applications for wind energy onshore. With the designation of the Sceirde Rocks Offshore Wind Farm as a relevant project, Corio Generation, given their extensive experience in the design, construction and operation of offshore wind energy developments throughout the world, are one of the first Applicants committed to helping the State achieve its CAP offshore wind targets. As such, the option of an onshore wind project is not considered to be a reasonable alternative considered by the Applicant at this time.

3.2.4.2 Wave Energy

Wave energy is a form of renewable energy that can be harnessed from the motion of waves through various methods that involve placing electricity generators on the surface of the sea. Like our wind resources, Ireland boasts one of the richest wave resources on the planet. However, as of 2024, electricity generation from waves is not widely employed for commercial applications in Ireland, or anywhere worldwide. Despite extensive research and a series of trial projects globally, the technology is not yet proven to be commercially viable. Wave energy technology Applicants in Ireland have struggled to test their designs at full-scale at sea, meaning investment in the industry has stalled. While the OAA may be suitable for the production of wave energy, significant further research is needed in wave energy generation in general, before reaching a stage where the OAA and similar sites are studied for their potential to generate commercial scale wave energy. Additionally, the sector requires long-term support, funding and policy measures to support the research and testing. For these reasons, wave energy was not considered a reasonable alternative for the OAA.

3.2.4.3 Tidal Energy

Tidal energy is harnessed by converting energy from tides into electricity. Similar to wave energy, tidal energy is not widely used globally and when compared to wind energy, tidal energy has traditionally suffered from relatively high cost and limited availability of suitable sites. In Ireland, investment and policy support in this sector are also lacking. Tidal currents are considerably influenced by local bathymetry, meaning they are strongest along eastern coasts where the flow velocity is greater. Tidal currents are generally low along the west and south costs of Ireland, meaning the Offshore Site's location off the west coast is unsuitable for tidal energy production. For these reasons, tidal energy was not considered a reasonable alternative for the Offshore Site.

3.2.4.4 Solar Energy

Commercial solar energy production is the harnessing and conversion of sunlight into electricity using photovoltaic (PV) arrays (panels). Ireland's first grid-scale onshore solar farm, the Millvale Solar Farm in Co. Wicklow, became fully operational in April 2022. To achieve the same electricity output from solar energy on land as is expected from the Offshore Site (c. 450 MW), a much larger development footprint would be required. As detailed in Section 1.1.1 in Chapter 1, the offshore MAC area encompasses an area of 23,722 ha. For comparison, the Millvale Solar Farm occupies 27 ha of land and has an installed capacity of up to 16 MW.

Due to the high wind speeds and Atlantic swells that frequent the Offshore Site, it was deemed unsuitable for the development of an offshore solar farm.

3.2.5 Alternative Project Design Options

Note that this application does not incorporate or seek permission for any design flexibility and the alternative designs discussed below are purely for the purposes of considering alternative as required under the EIA Directive.

3.2.5.1 Offshore Site

3.2.5.1.1 *Alternative Turbine Numbers and Model*

The Project will have a Maximum Export Capacity of 450MW. It is proposed to install 30 no. turbines at the OAA in order to achieve this output. Consideration has been given to reducing the capacity of the turbines and increasing the number of proposed turbines, for example if the Project was to select an 8MW turbine, and based on a capacity of 450MW, the number of turbines would increase to 56 number turbines. Thus increasing the required footprint of the OAA. Furthermore, the use of smaller turbines would not make efficient use of the wind resource at sea having regard to the nature of the OAA. Many smaller turbines would result in the wind farm occupying a greater footprint within the OAA, with a larger amount of supporting infrastructure being required (i.e., foundations etc), and increasing the potential for environmental impacts to occur. The proposed number of turbines takes account of all site constraints and the distances to be maintained between turbines and associated infrastructure, while maximising the wind energy potential of the OAA. The 30-turbine layout selected for the Project will achieve the optimum output at a more consistent level than would be achievable using different turbines.

The turbine model to be installed on the Offshore Site will have a blade tip height of 324.9m (from Lowest Astronomical Tide); a rotor diameter 292m; and a hub height of 178.90m. The use of alternative smaller turbines at the Offshore Site would not be appropriate as they would fail to make the most efficient use of the wind resource passing over the Offshore Site and would potentially require a larger development footprint. This alternative would potentially lead to additional environmental effects.

A comparison of the potential environmental effects of the installation of a larger number of smaller WTG's when compared against the chosen option of installing a smaller number of larger WTG's on the site is presented in Table 3-2 below.

Table 3-2 Comparison of environmental effects when compared to the chosen option (30 wind turbines, higher 450 MW output)

Environmental Considerations	Larger number of smaller turbines	Chosen option of a 30-turbine layout
Physical and Coastal Processes	Greater overall seabed footprint due to more seabed preparation and larger number of turbine foundations, stonebeds, jack-up events, IACs and associated protection have the potential to affect seabed levels and substrate properties due to larger area being occupied by infrastructure. Larger potential for water column interference due to larger number of vertical structures and increased scour potential due to more foundations.	Smaller overall footprint due to less seabed preparation and smaller number of turbine foundations, stonebeds, jack-up events, IACs and associated protection which could potentially affect seabed levels and substrate properties due to area being occupied by infrastructure. Less potential for seabed scouring due to fewer turbine foundation locations. Less potential impact on water column processes due to fewer vertical structures. No significant impact associated with coastal processes because only the OEC entry point is located near the coast.
Water and Sediment Quality	Greater overall seabed footprint due to more seabed preparation and larger number of turbine foundations, stonebeds, jack-up events, IACs and associated protection. Construction of these has the potential to disturb seabed sediments, release potential contaminants and increase the suspension and settlement of sediment to a wider area, with potential impacts to sediment and water quality. Installation of more turbines would extend the duration of the construction phase and lead to longer period of potential impacts on water and sediment quality. Increases the likelihood of maintenance being required during the operational phase. Maintenance operations have the potential to disturb seabed sediments and increases the likelihood of accidental release of pollutants.	Decreased overall seabed footprint due to smaller number of locations requiring turbine foundations, stonebeds, jack-up events, seabed preparation, IACs and associated protection. Fewer turbines minimise the potential seabed disturbance, potential release of contaminants and associated suspension and settlement of sediment. Installation of fewer turbines limits the duration of the construction phase and potential impacts on water and sediment quality. Fewer turbines minimise the potential maintenance requirements during the operational phase, reducing potential seabed disturbance and potential for accidental release of pollutants.

Environmental Considerations	Larger number of smaller turbines	Chosen option of a 30-turbine layout
Intertidal and Benthic Ecology	Greater overall seabed footprint due to larger number of turbine foundations, stonebeds, jack-up events, IACs and associated protection required. Areas requiring seabed preparation such as boulder clearance would be greater. This has the potential to disturb and displace sensitive benthic habitats and species. Installation of more turbines would also extend the duration of the construction phase and delay the recovery period of benthic habitats and species.	Decreased overall seabed footprint due to smaller number of locations requiring turbine foundations, stonebeds, jack-up events, IACs and associated protection. While individual footprints of the WTG increase with turbine size, the cumulative footprint from fewer but larger turbines is less than the alternative. Greater distance between the larger turbines and larger area of undisturbed seabed available for benthos limits impacts and promotes habitat and species connectivity and recoverability. Intertidal footprint is unimpacted by the size and number of the turbines.
Fish and Shellfish Ecology	Greater overall seabed footprint due to larger number of turbine foundations, stonebeds, jack-up events, IACs and associated protection required. Areas requiring seabed preparation such as boulder clearance would be greater. This increases the potential for fish and shellfish habitat loss and disturbance and may introduce barrier effects for migratory fish. More infrastructure could lead to increased ghost fishing due to lost fishing gear becoming entangled in installed infrastructure. Installation of more turbines would extend the duration of the construction phase and lead to longer period of potential disturbance from underwater noise and increased suspended sediment concentrations. More IACs could increase the potential impacts from electromagnetic fields and thermal emissions on fish and shellfish species. More turbines increase the likelihood of maintenance being required during the operational phase. Maintenance operations have the potential to disturb seabed sediments and increases the likelihood of	While individual seabed footprints of the WTG increase with turbine size, the cumulative footprint from fewer but larger turbines is less than the alternative. This limits the potential fish and shellfish habitat loss and disturbance and barrier effects for migratory fish. Shorter construction period and less infrastructure limits the potential disturbance from underwater noise and increased suspended sediment concentrations. Fewer IACs minimises the potential impacts from electromagnetic fields and thermal emissions on fish and shellfish species. Fewer turbines minimise the potential maintenance requirements during the operational phase, reducing potential seabed disturbance and potential for accidental release of pollutants which could impact fish and shellfish.

Environmental Considerations	Larger number of smaller turbines	Chosen option of a 30-turbine layout
	accidental release of pollutants which could impact fish and shellfish.	
Marine Ornithology	Larger number of turbines increases the space taken by the WTG and consequently the potential disturbance, injury and mortality risk to birds from collision and displacement compared to fewer turbines. Increased seabed footprint from the infrastructure has the potential to increase impacts on birds and their prey species from disturbance and displacement. Longer construction and decommissioning periods and potential for increased maintenance requirements can lead to increased disturbance from noise, displacement and vessel presence.	Fewer, larger turbines will have a smaller rotor-swept area than a similar generation capacity made up of a greater number of smaller turbines, which also limits the space occupied (and number of obstructions posed) by the WTGs within the Offshore Site. This consequently will result in a smaller collision risk than a larger array of smaller turbines with similar generating capacity. Fewer turbines reduced the seabed footprint from infrastructure, reducing the disturbance and displacement effects on birds and their prey species. Shorter construction and decommissioning periods and less maintenance limits the disturbance and injury from vessel presence, noise and displacement.
Marine Mammals and Other Megafauna	Greater overall seabed footprint due to larger number of turbine foundations, stonebeds, jack-up events, IACs and associated protection required. More infrastructure increases the likelihood of collisions with construction, maintenance and decommissioning vessels and the infrastructure itself. Installation of more turbines would extend the duration of the construction phase and lead to longer period of potential disturbance and injury from underwater noise, water quality and vessel presence on marine mammals, turtles and basking shark and their prey species. More turbines increase the likelihood of maintenance being required during the operational phase. Maintenance activities have the potential to lead to disturbance of marine mammals, turtles and basking shark due to noise and vessel presence.	While individual seabed footprints of the WTG increase with turbine size, the cumulative infrastructure footprint from fewer but larger turbines is less than the alternative. Shorter construction period restricts the potential period of disturbance and injury on marine mammals, turtles and basking shark and their prey species from noise and vessel presence. Less infrastructure limits the potential displacement, barrier effects and interference with foraging opportunities. Fewer turbines minimise the potential maintenance requirements during the operational phase, reducing the potential disturbance from vessel presence and underwater noise. Larger turbines may increase the noise generated by the WTG, but

Environmental Considerations	Larger number of smaller turbines	Chosen option of a 30-turbine layout
		the number of turbines and greater distances between the turbines reduce this effect compared to a larger number of smaller turbines.
Commercial Fisheries	Longer construction period and greater overall seabed footprint along with shorter spacing between WTGs due to larger number of turbine foundations, stonebeds, IACs and associated protection can lead to increased temporary and long-term displacement and restrict access to fishing grounds. This also increases the potential gear entanglement risk and increases the area potentially unavailable for target fish species and their prey. The potential increase in maintenance requirements and longer construction and decommissioning periods due to larger number of turbines has the potential to disturb commercial fishing activities due to increased vessel traffic. Larger area occupied by the WTG can increase the steaming times due to larger alterations of transit routes and increased vessel traffic.	Smaller seabed footprint from less infrastructure and shorter construction and decommissioning periods along with longer spacing between WTGs reduces the potential for displacement and restricted access to fishing grounds. Shorter construction and decommissioning periods limit interference with fishing activities, transit times and fishing grounds.
Shipping and Navigation	Longer construction and decommissioning periods and greater overall seabed footprint along with shorter spacing between WTGs due to larger number of turbine foundations, stonebeds, IACs and associated protection have the potential to interfere with shipping and navigation. Increased vessel traffic has the potential to interfere with navigation due to access restrictions and increased steaming times.	Shorter construction and decommissioning periods, reduced maintenance requirements and reduced vessel traffic due to less infrastructure limits the potential interference with shipping and navigation. The smaller seabed footprint and longer spacing from fewer WTG limits the potential displacement, navigation hazards and entanglement risk.
Civil and Military Aviation	Larger number of turbines increases the horizontal extent of the Offshore Development area and associated airspace compared to fewer turbines. The number of physical obstacles potentially affecting air traffic is also greater. This increases the potential interference with aviation and radars.	Larger turbine height and blade size has the potential to increase interference with aviation and radars compared to smaller turbines. Fewer turbines however limit the space occupied by the WTG within the Offshore Development area, reducing the interference and collision risk compared to a larger number of turbines.

Environmental Considerations	Larger number of smaller turbines	Chosen option of a 30-turbine layout
		The height and design of the turbines has been designed to account for potential impacts on aviation and radar.
Seascape, Landscape and Visual Amenity	Larger number of smaller turbines has the potential to cause greater seascape, landscape and visual effects and clutter than fewer larger well spaced turbines.	Larger turbine height and blade size increase the visibility of the WTGs from long range views but due to the distance of the Offshore Site to the coast these impacts are considered neutral compared to smaller turbines.
Marine Archaeology	Greater overall seabed footprint due to increased seabed preparation and larger number of turbine foundations, stonebeds, jack-up events, IACs and associated protection increases the likelihood of encountering archaeological assets and potential impacts on them.	Smaller overall seabed footprint limits likelihood of encountering archaeological assets and potential impacts on them.
Other Users of the Marine Environment	Longer construction and decommissioning periods and greater overall spatial and seabed footprint due to larger number of turbine foundations, stonebeds, IACs and associated protection have the potential to interfere with and displace other sea users. This increased spatial extent of the site can also interfere with other businesses and recreational activities compared to an area with fewer turbines. The potential increase in maintenance requirements and associated vessel traffic due to larger amount of infrastructure has the potential to disturb other sea users during the operational period.	Shorter construction and decommissioning periods, reduced maintenance requirements and reduced vessel traffic due to less infrastructure limits the potential interference with and displacement of other sea users. The smaller seabed footprint from fewer WTG limits interferences. The reduced anticipated maintenance requirements limit the potential impacts from vessel traffic during the operational period.
Offshore Air Quality and Airborne Noise	Longer construction and decommissioning periods and increased potential for maintenance due to more infrastructure would lead to a longer period of construction activities and vessel movements. This also has the potential to increase the duration and magnitude of emissions capable of affecting air quality.	Larger turbines may increase the airborne noise generated by the WTG, but the smaller number of turbines and greater distances between the turbines reduce this effect compared to a larger number of smaller turbines. Due to the distance of the turbines to any sensitive onshore receptors, the impacts from the noise generated by larger turbines are considered

Environmental Considerations	Larger number of smaller turbines	Chosen option of a 30-turbine layout
	Larger number of turbines has the potential to increase the airborne noise generated by the Project.	neutral compared to smaller turbines. Shorter construction and decommissioning periods reduce the potential emissions from construction vessels, limiting any potential impacts on air quality. Fewer turbines minimise the potential maintenance requirements during the operational phase, reducing the potential disturbance from vessel traffic on airborne noise and air quality.

3.2.5.1.2 *Alternative Turbine Layout and Design Development*

The design of the Offshore Site has been an informed and collaborative process from the outset, involving a wide team of designers, engineers and various experts from specialist areas such as geotechnical, environmental, archaeological, ecological, shipping and navigation, and landscape/seascape visual specialists. The overall aim being to develop an optimal layout, considering site specific data, whilst ensuring an overall objective to reduce any potential for environmental effects while designing an economically viable project capable of being constructed.

Throughout the preparation of this EIAR, the layout of the Offshore Site has been revised and refined to take account of the findings of all site investigations, which have brought the design from its first initial layout to the current proposed layout. The design process has also taken account of the recommendations and comments of the relevant statutory and non-statutory organisations, the local community and local authorities as detailed in Sections 2.7 and 2.8 of Chapter 2 of the EIAR.

Constraints and Facilitators Mapping

The constraints map for the Offshore Site, as shown in Figure 3-4, was produced following a desk study of Offshore Site constraints. Figure 3-4 encompasses the following constraints and associated buffers.

Facilitators at the site build on the existing advantages and include the following:

- Suitable water depths and distance from shore;
- Suitable seabed topography
- Excellent wind resource;
- Wave heights; and
- Limited extent of constraints.

The inclusion of the constraints above allows for a viable area to be identified, and determination of available areas of the seabed for development. In addition, access to the national grid was a consideration, with this already identified as either the Cashla Substation or Moneypoint 220kV Substation.

An initial turbine layout is then developed to take account of all the constraints mentioned above and their associated buffer zones and the separation distance required between the turbines. Following the initial mapping of all known constraints, detailed site investigations were carried out by the Project team to inform further iterations of the design.

The turbine layout for the OAA has also been informed by the results of benthic, geophysical, landscape and visual and the separation distance to be maintained between turbines. Thus, the baseline environmental assessment of the Offshore site and wind farm design was an iterative process, where findings at each stage of the assessment were used to further refine the design, always with the intention of minimising the potential for environmental impacts.

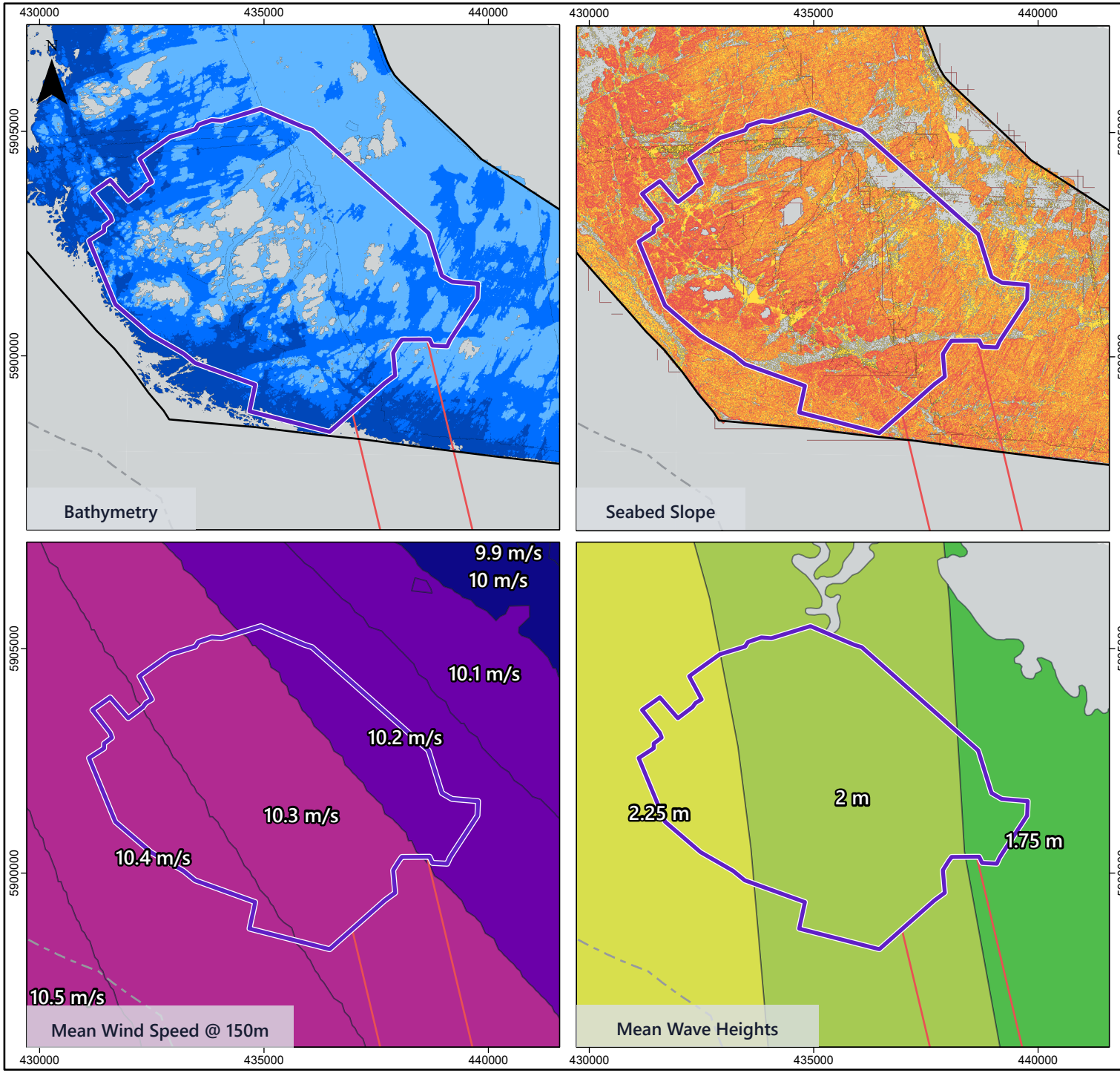
Table 3-3 below details the constraints used to help determine an appropriate layout

Table 3-3 – Offshore Constraints and Facilitators

Characteristics of the Seabed	The Offshore Site has been the subject of extensive surveys, including geophysical, geotechnical, water/sediment and benthic surveys. Additional bathymetry data were also sourced from INFOMAR to improve coverage along the Offshore Export Cable Corridor (OECC). Ground truthing of the geophysical data was also undertaken using Drop-Down Camera and sediment grab sampling to obtain digital photographic stills and video footage of the seabed. Prior to commencement of the construction, further surveys may be conducted to inform detailed engineering and construction planning for the Offshore Site. The surveys undertaken informed a greater understanding of the ground conditions and seabed topography, which in turn have been used to refine the layout of the Offshore Site, including micro-siting of WTGs, and to inform the route of the Offshore Export Cable (OEC) and placement of inter-array cabling.
Metocean Conditions	The OAA lies in coastal waters on the Irish Shelf, approximately 5 to 11.5 km off the southwest coast of county Galway, in water depths ranging from approximately 0 m to 60 m. The OEC extends from the OAA southeast to the Landfall, at Killard in County Clare. The OEC encompasses intertidal areas at the possible landfall locations (between MHWS and MLWS) and sublittoral waters up to approximately 90m water depth. In the OAA, the annual average wave height increases from the southeast to the northwest of the site, ranging overall from <1 m to approximately 3 m. Waves in the bay generally propagate from the southwest and those of 3m in height are unlikely to be locally generated due to the maximum fetch in the bay. The area is influenced by water currents moving predominantly south to north around the western coast of Ireland. Along the OEC, the annual average wave height ranges from approximately 2.5 m in the deeper, western parts of the OEC to <1 m in more sheltered areas, for example in Liscannor Bay.
Consideration of Other Sea Users	The sensitivities associated with other marine users of the Offshore Site was an important element of the site selection process. An initial desk-based approach was used to establish the baseline environment through publicly available data sources and literature. Following this, consideration was given to avoid and minimise potential impacts to other sea user receptors within the Offshore Site during the site selection process. Additionally, further consultation and scoping with relevant stakeholders has continued through the pre-application stage and remains ongoing at

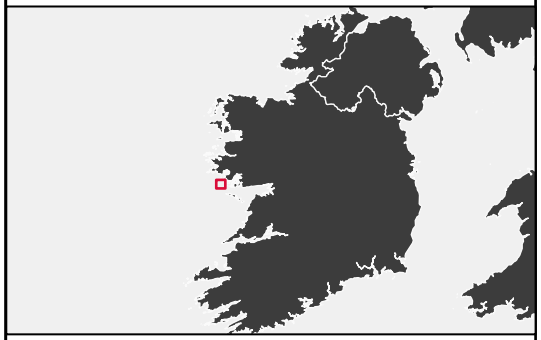
	the time of writing. Consideration of the other marine users identified during the desk-based studies is further discussed under separate headings below.
Oil and Gas Activities	The location of the OAA off Ireland's west coast comprises an isolated, non-extensive area of oil and gas activities and exploration. The Offshore Site extends across a number of oil and gas licence blocks. However, given its relatively close proximity to the west coast of Ireland, the Offshore Site does not overlap with any active leases, and the closest exploration area for oil and gas activities is the EL4/06 exploration field, operated by Island Oil & Gas located approximately 65 km to the west of the offshore study area. This area of exploration licence expired in November of 2022 (EMODnet, 2022). There are no oil and gas exploration wells that directly interact with the Project. The closest well to the OAA is the Pentagone 84 well, located approximately 100 km to the west. Additionally, there are no active boreholes along the west coast of Ireland; of all 50 boreholes identified, 43 are abandoned, and 7 have suspended operations (EMODnet, 2022). There are no offshore installations along the west coast of Ireland. The Corrib subsea steel installation, located approximately 137 km to the north west of the OAA, has been decommissioned (EMODnet, 2022). There are no oil and gas pipelines that directly interact with the Offshore Site.
Marine Dredge Disposal Sites	There are a number of licenced marine dredge disposal sites along the west coast of Ireland, none of which are in close proximity to the Offshore Site.
Aquaculture	Aquaculture activities in Ireland are extensive along the west coast with finfish, shellfish and freshwater production extensive across the country. There are a number of active salmon finfish production activities located along the coasts of Lettermullan, Lettermore and Carraroe on the south coast of County Galway. These sites will interact with the other marine users study area, however there is no direct overlap with the Offshore site. Additionally, there is a diversified freshwater fish production site at Lettermore. There are several oyster and mixed shellfish production sites along the coasts of County Galway, County Clare and the Isle of Inishmore. However, these activities are largely coastal or terrestrial, and do not directly interact with the Offshore Site or the other marine users study area.
Other Renewable Energy Developments	A number of planned offshore renewable developments (at various levels of inception) were proposed to be developed off the western coast of Ireland before the State's policy changed to a plan-led regime. Current policy is such that none of these projects are permitted to seek a MAC or make a planning application. However, whether any of them may progress in the future is entirely dependent on future policy decisions and there is no reasonable basis for considering cumulative effects from them with the Project.
Submarine Cables	There are no active or disused power cables that directly interact with the offshore study area. A single telecommunication cable, owned by Farice, is located within the Offshore Site. This cable (the IRIS Sub-Sea Telecoms Cable System) directly interacts with the OEC and has been considered during the design and routing of the OEC. The IRIS cable connects Galway to Iceland, with installation activities completed in 2022 and operation beginning in early 2023 (KISORCA, 2022; Submarine Cable Networks, 2022). A further cable is in the early stages of planning; this is known as PISCES (Deep Sea Fibre Ltd.), proposed to make landfall in the vicinity of Galway.

Military Exercise Areas	There are no military exercise areas and danger areas that directly interact with the Offshore Site or the offshore EIAR study area. The closest military exercise area to the Offshore Site is the X5501: Northern Fleet Exercise Area, located approximately 72 km northwest of the OAA. There are no current or historic munitions disposal sites within the vicinity of the Offshore Site or the EIAR Site Boundary. However, there is still potential for interaction between the Project and unexploded ordnance (UXO), for example, World War I mines, which is considered further in Chapter 12 – Marine Mammals and Appendix 12-1 - Underwater Noise Modelling & Assessment Report.



SCEIRDE ROCKS WINDFARM

Feirm Ghaoithe Charraigeacha Sceirde



Offshore Array Area
Offshore Export Cable Corridor
INFOMAR Bathymetry Data Footprint
Ireland 6 NM limit
Ireland 12 NM Limit

Bathymetry
- <15 m
- 15 - 30 m
- 30 - 45 m
- 45 - 60 m
- > 60 m

Seabed Slope (deg)
- <1
- 1 - 4
- 4 - 15
- >15

Mean Wind Speed @ 150 m
- <10 m/s
- 10 - 10.25 m/s
- 10.25 - 10.5 m/s

Mean Annual Wave Height (m)
- 1.75
- 2
- 2.25

0 0.8 1.6 nm
0 1.5 3 km

PROJECT TITLE
Sceirde Rocks

MAP TITLE
Constraints

VER	REMARKS	DATE	Drawn	Approved
1	DRAFT	06/12/2024	BQ	EE

DRAWING NO
Figure 3-4

SCALE	PAPER SIZE	DATUM	PROJECTION
1:125,000	A4	WGS 84	UTM 29N

Alternative Wind Farm Site Layout Iterations

The OAA is a high-wind site, so maximising the energy through the choice of WTG was a key consideration during the site layout design. Allowing for the maximum export capacity of 450MW and following extensive engagement with the supply chain, a suitable WTG (and associated parameters) was selected. Since the Project was acquired by the Applicant in September 2021, the site layout has been through various design iterations. The final site layout and design is indicated in Plate 3-5 and is provided within this application to An Bord Pleanála, and for which a full environmental impact assessment has been undertaken.

The final proposed OAA layout takes account of all site constraints and the distances to be maintained between turbines and sensitive receptors. It was essential that site-specific characteristics were considered at all stages of the design. The layout is based on the results of all site investigations that have been carried out during the EIAR preparation. In addition, feedback received during the various stages and methods of stakeholder engagement undertaken as part of the Project have been considered.

As information regarding the Project was compiled and assessed, the number of turbines and the proposed layout have been revised and amended to take account of the physical constraints of the Offshore Site, and the requirement for buffer zones and consideration of seabed conditions (seabed topography), geophysical data, geotechnical data, and metocean conditions, as well other areas in which no turbines could be located. The selection of the number of WTGs and layout has also had regard to wind-take, the separation distance to be maintained between turbines and positioning requirements of the installation vessel. The EIAR preparation and the Project's design process was an iterative process, where findings at each stage of the assessment were used to further refine the design, always with the intention of minimising the potential for environmental impacts.

The development of the final Project site layout has resulted following feedback from the various studies and assessments carried out as well as ongoing discussions with other sea users, landowners, the local community, and scoping consultees.

There were several reviews of the specific locations of the various turbines during the optimisation of the Offshore Site layout. The initial site investigation activities and constraints studies identified a viable area within the overall study area of the Project site. The OAA turbine layout went through several iterations. Plate 3-1 to Plate 3-5 below provide an indication of how the design of the turbine layout evolved during the design process.

The initial iteration for the OAA site layout is for 30 turbines on the original MAC area and is shown in Plate 3-1. This layout is based on having 30WTG locations in an ideal grid format spread over the site area. The turbines are separated by the recommended spacing of ca 4.2-time rotor diameters as recommended by turbines suppliers.

Geophysical surveys were undertaken in Summer 2022 with further surveys in Autumn 2023 and Spring/Summer 2024. Geotechnical surveys were undertaken in Autumn 2023 and Spring/Summer 2024. Analysis of this survey data gave progressively more information about the ground conditions of the site. The first factor considered was the potential to install piled foundations into the seabed. Most of the site ground conditions are hard rock and therefore not amenable to piled installation. This led to Gravity Base Structure (referred to as GBS) fixed bottom foundations being selected for the site as discussed in more detail in Section 3.2.5.1.3 below.

Initial project installation concept was that the GBS need to be installed in water depths of minimum 15 metres. Plate 3-2 shows the 30 turbine locations in a grid format and water depths <15metres excluded. This shows that this layout was not feasible with some of the turbines located in unsuitable water depths.

In order to accommodate the maximum number of turbines on the site, and within suitable locations, the turbine locations were moved from a grid format to a dense boundary type layout. This is shown in Plate 3-3. This layout resulted in 26 turbine locations on the site.

Further development of the installation engineering informed the Project that the GBS fixed bottom foundations need to be installed on level ground. Seabed slope of 9 degrees is the limit of the feasibility of sea bed levelling to give the GBS a level foundation. Therefore areas of >9 degree seabed slope should be avoided for siting of the foundations.

Based on consultation with experienced offshore installation contractors the concept of floating installation was considered most suitable for the Project as opposed to lift in to place. This installation concept requires a minimum clearance of 150 m width around turbine positions with water depths of at least 12m throughout that area.

Plate 3-4 shows the layout of foundation locations when the above technical constraints were considered. The plate demonstrates that the site was not able to provide sufficient area for the foundations to be installed in a grid layout as only 24 turbine locations could be accommodated. This would have resulted in the Project not producing the previously noted export capacity of 450MW.

This led to the application to MARA for a Material Amendment of the MAC under Section 86(1) of Maritime Area Planning Act 2021 to amend the array area. This application was granted by MARA in June 2024 and resulted in a ca. 26.7% increase in the OAA boundary.

The extended MAC area enabled 30 WTG locations to be achieved on site and meet the constraints of the site. This led to the development of the layout given in Plate 3-5. This layout is the final layout for which consent is sought in this application.

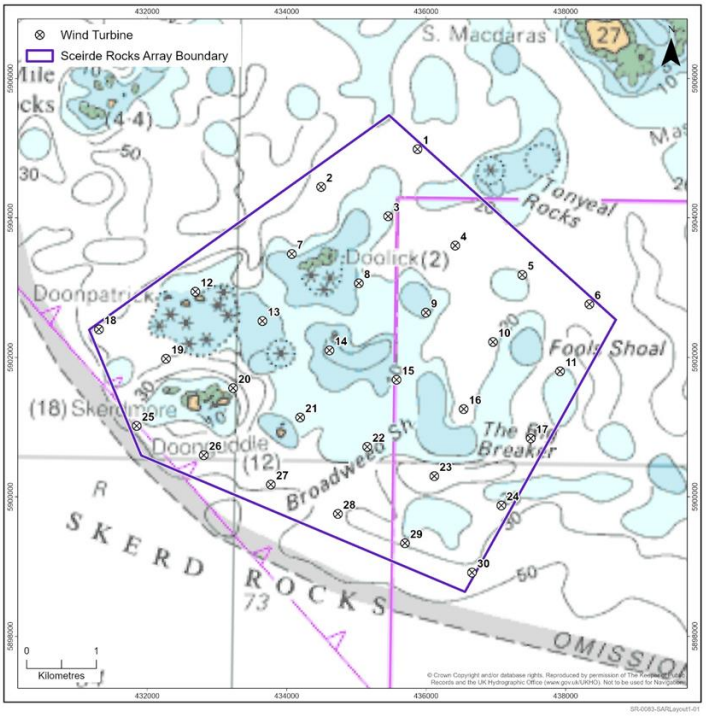


Plate 3-1 Proposed Layout Iteration No. X1

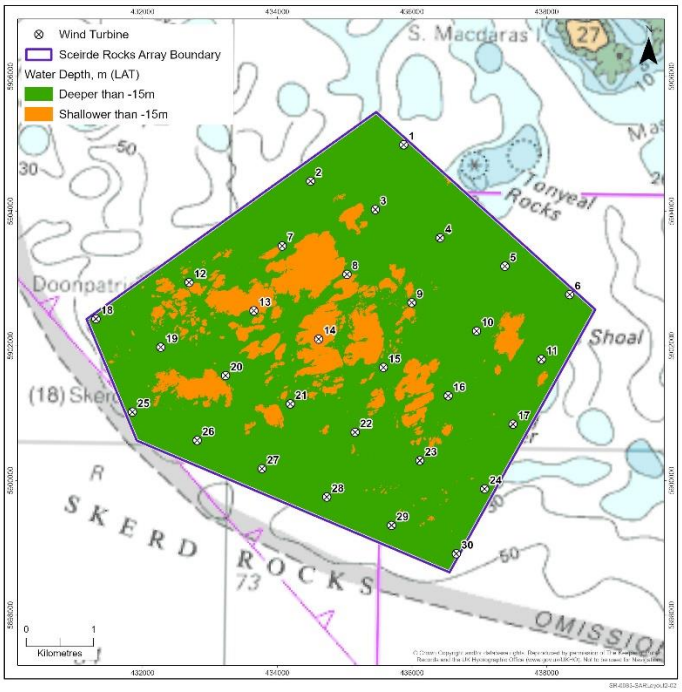


Plate 3-2 Proposed Layout Iteration No. 2

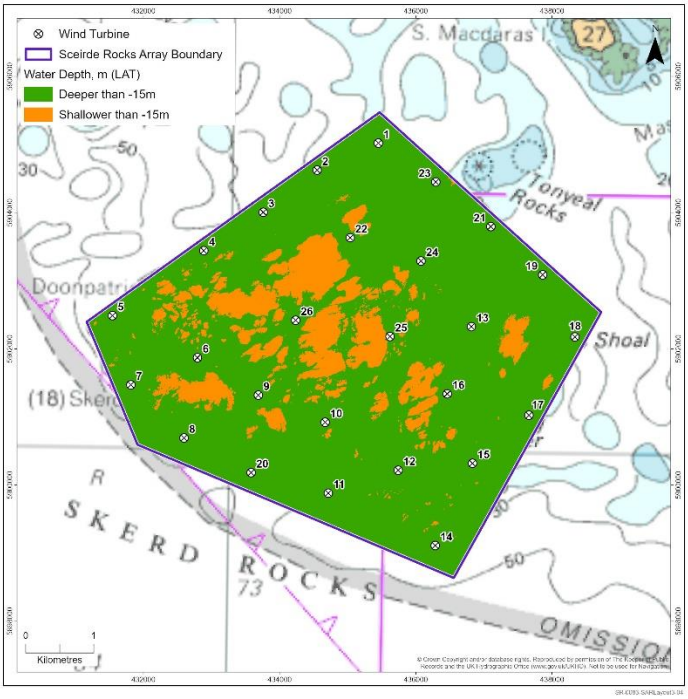


Plate 3-3 Proposed Layout Iteration No. 3

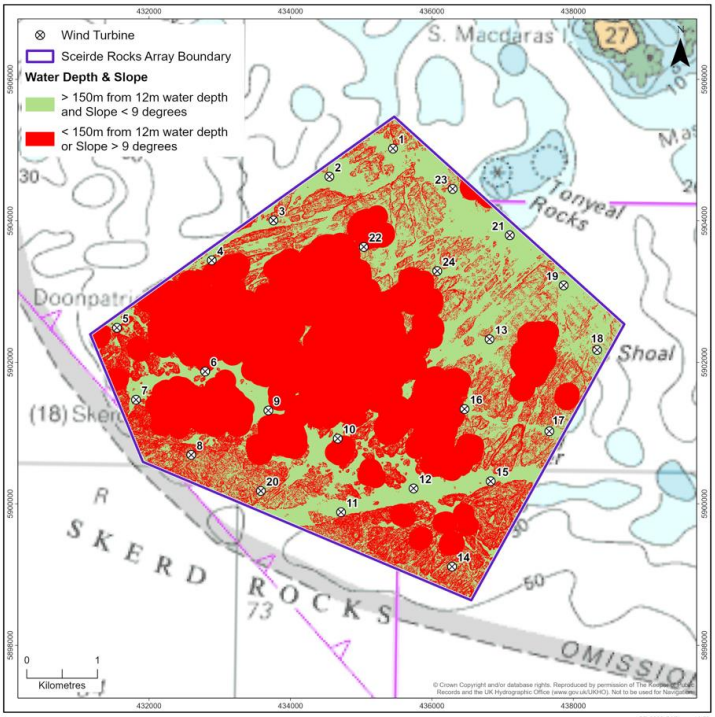


Plate 3-4 Proposed Layout Iteration No. 4

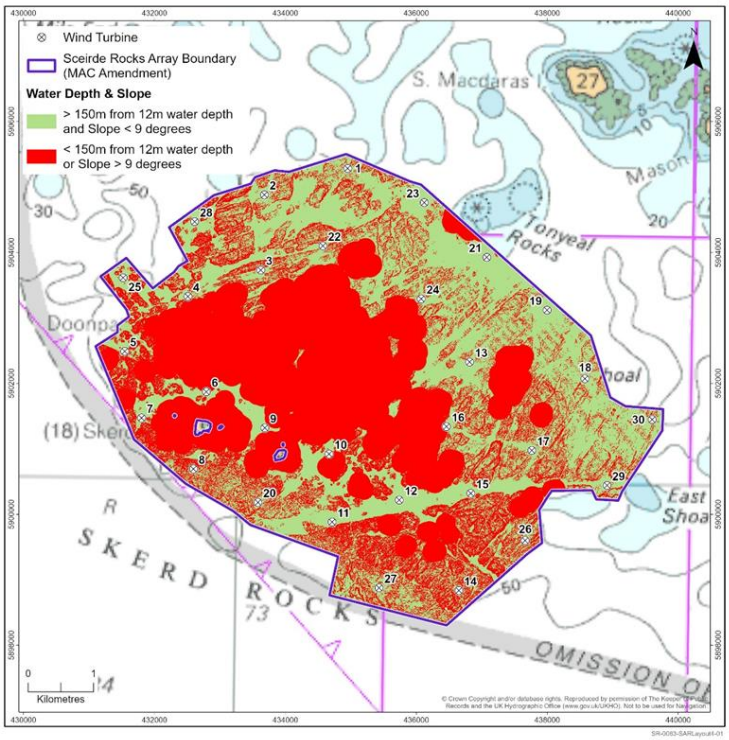


Plate 3-5 Proposed Layout Iteration No. 5

3.2.5.1.3 *Alternative Turbine and Offshore Substation Foundations*

Foundation choice in wind farm sites located offshore is primarily driven by:

- Water depth (structure size through the water column and the practicalities of installing same)
- Ground conditions (structure penetration and fixity on/in the seabed)
- Metocean conditions (the forces of the sea and winds on the structure directly and caused by interaction of these with the turbine positioned atop the structure)

The Offshore Site is located in an area with water depths ranging between approximately 0m and 60m. The seabed within the OAA comprises rocky outcrops, which means that any piled structures, such as monopiles or piled jackets, would need to be carefully installed drilling into the rock where necessary. The metocean conditions at the site are strong. This meant that piled structures could be suitable, as they would be designed to withstand the site metocean conditions, however the length of time required to install these foundations is significant. Alternatively, gravity base structures (GBS) could work well as they would not need to penetrate the rocky seabed and could be designed to accommodate the site metocean conditions.

As the engineering requirements and design of the Project progressed, it was confirmed that both piled jacket foundations and GBS fixed bottom foundations could suitably support and anchor the WTGs within the OAA, considering metocean conditions of the site. However, the practicalities of installing piled foundations were not advantageous or efficient. For piled jackets, the installation vessel would need to be operating at the OAA for significant periods of time, due to the time needed to pile into the rock on and below the seabed. For GBS, the installation is more straightforward with the GBS floated into position, therefore the need for a vessel for long durations is not required. This was a prime consideration where weather windows for works can be limited.

The activities associated with piling foundations for site preparation or reverse-circular drilling would have greater seabed disturbance, increased underwater noise, and more significant impacts on ecological receptors. This, combined with the longer duration for installation of piled foundations meant that piled foundations were no longer taken forward as a viable foundation design for the Project. The GBS was therefore deemed to be the best option in terms of efficiency for installation and reducing the potential for significant environmental effects at the OAA.

The same GBS fixed bottom foundation design is proposed for both the WTGs and the OSS.

Floating Sub-Structures

The bathymetry within the Offshore Site, with water depths less than 60 m, presents an opportunity for the installation of fixed-bottom foundations. WTG's with floating substructures are more appropriate for water depths greater than 60m, both from a design perspective and commercially. Whilst the minimum allowable water depth for a floating turbine will depend on the floater design and the type of floating substructure, the site is deemed too shallow for the required draft of a fully integrated floating turbine. It should also be noted that floating offshore wind has not yet been proven at a commercial scale and the cost for this technology is still significantly higher than for fixed bottom solutions - recent prices from the Auction Round 6 in the UK showed a single floating wind project successful with a price per unit of electricity more than double that of fixed bottom projects in the same auction[1]. A publication issued recently by the Irish Whale and Dolphin Group (IWDG)[2] discussed articles published in national newspapers that highlighted concerns over the development of recent Phase I

[1] https://assets.publishing.service.gov.uk/media/66d6ad7c6eb664e57141db4b/Contracts_for_Difference_Allocation_Round_6_results.pdf
[2] https://iwdg.ie/floating-wind-a-technology-for-the-future/

bottom-fixed offshore wind farms in the Irish Sea and off Connemara, and whether the State should divert its energies into building floating offshore wind (FLOW) far out to sea. In these articles, it was also claimed that FLOW has less environmental impact and has the advantage that greater distance from shore will remove the visual impact on nearby residents. The IWDG responded in their publication that FLOW will have its own environmental impacts, some of which are unique. The IWDG note that development of FLOW is central to Ireland's longer-term plans to decarbonise our energy systems but are concerned that any delays to the current plans to develop Offshore Renewable Energy (ORE) will result in far more environmental cost to the marine environment, and that wagering all on a technology still in development is a risky approach.

In addition to the above physical constraints, and as previously set out, as a Relevant Project (part of the Phase 1 projects), the Project is seen as a key facilitator in assisting Ireland to achieve the CAP 2024 targets for 5GW of fixed-bottom Offshore Renewable Energy by 2030. Whilst there may be a place for floating offshore wind projects off the west coast of Ireland in future as policy evolves, this technology is not currently a reasonable alternative.

3.2.5.1.4 *Alternative Offshore Substation (OSS) Location*

Similar to the selection and finalisation of the WTG positions within the OAA, the selection of the location for an OSS was influenced by seabed conditions (seabed topography), geotechnical data, geophysical data, metocean and benthic conditions.

Other considerations for the OSS include;

- Accessibility both for Transportation and Installation (T&I) and for Operations and Maintenance (O&M)
- EirGrid Requirements – particularly 500m working zone required either side of the export cable route to enable safe access for cable maintenance and operation activities by a suitable vessel
- Inter Array cable lengths (particularly the length of the last string from the WTG to OSS)
- Export Cable lengths

In total there have been six iterations of positioning the OSS and these are provided in Figure 3-5.

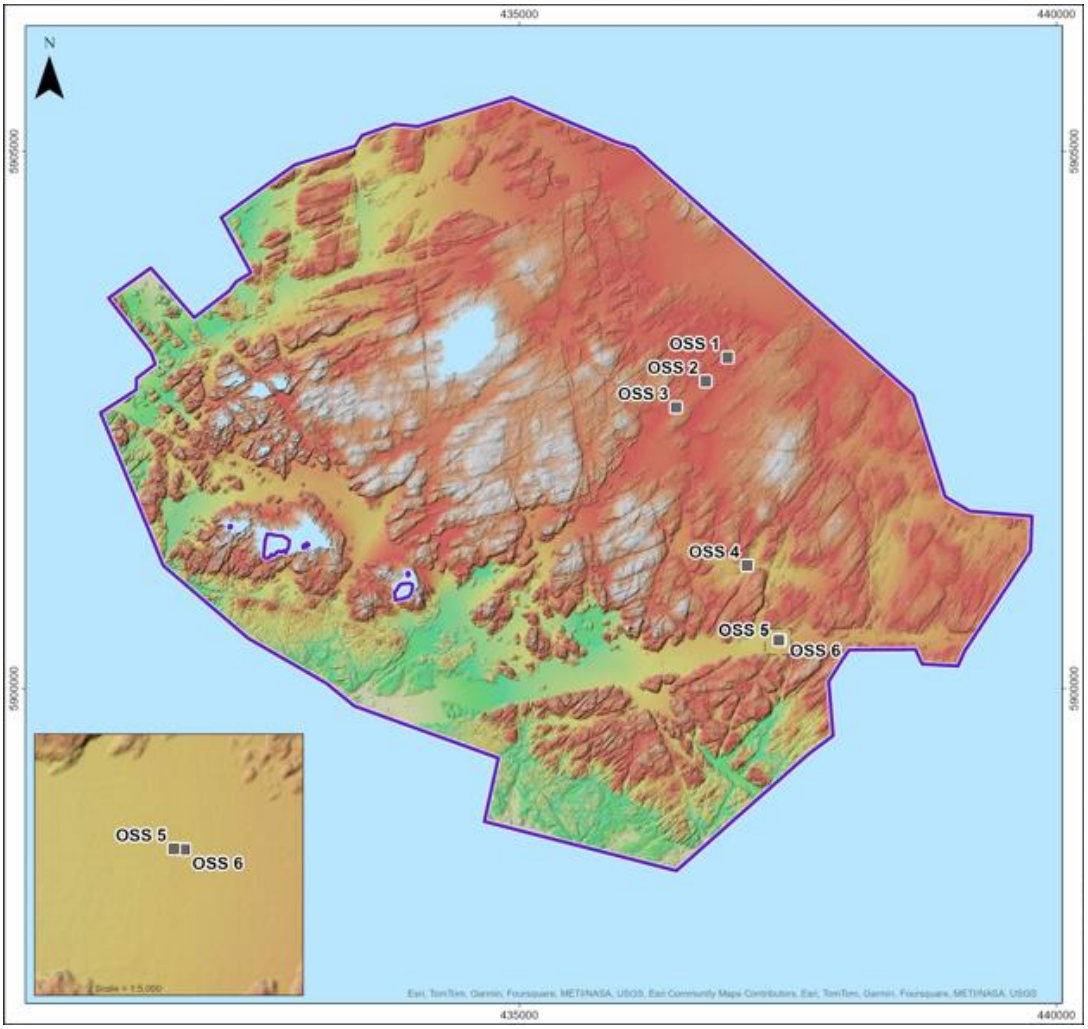


Figure 3-5 OSS Location Iterations

A brief overview of the considerations for the siting of the various key options 1, 4 and 6 is provided below.

OSS Location 1 (OSS 1)

- The position of OSS 1 would add significant length to the required export cable.
- Increased vessel traffic through the site during O&M phase

OSS Location 4 (OSS 4)

- Reduction in export cable length
- With particular reference to T&I and O&M considerations, location OSS 4 is found to be constrained as a possible OSS location. Surrounding rock outcrop limits the accessibility options for jackup positioning.

OSS Location 6 (OSS 6)

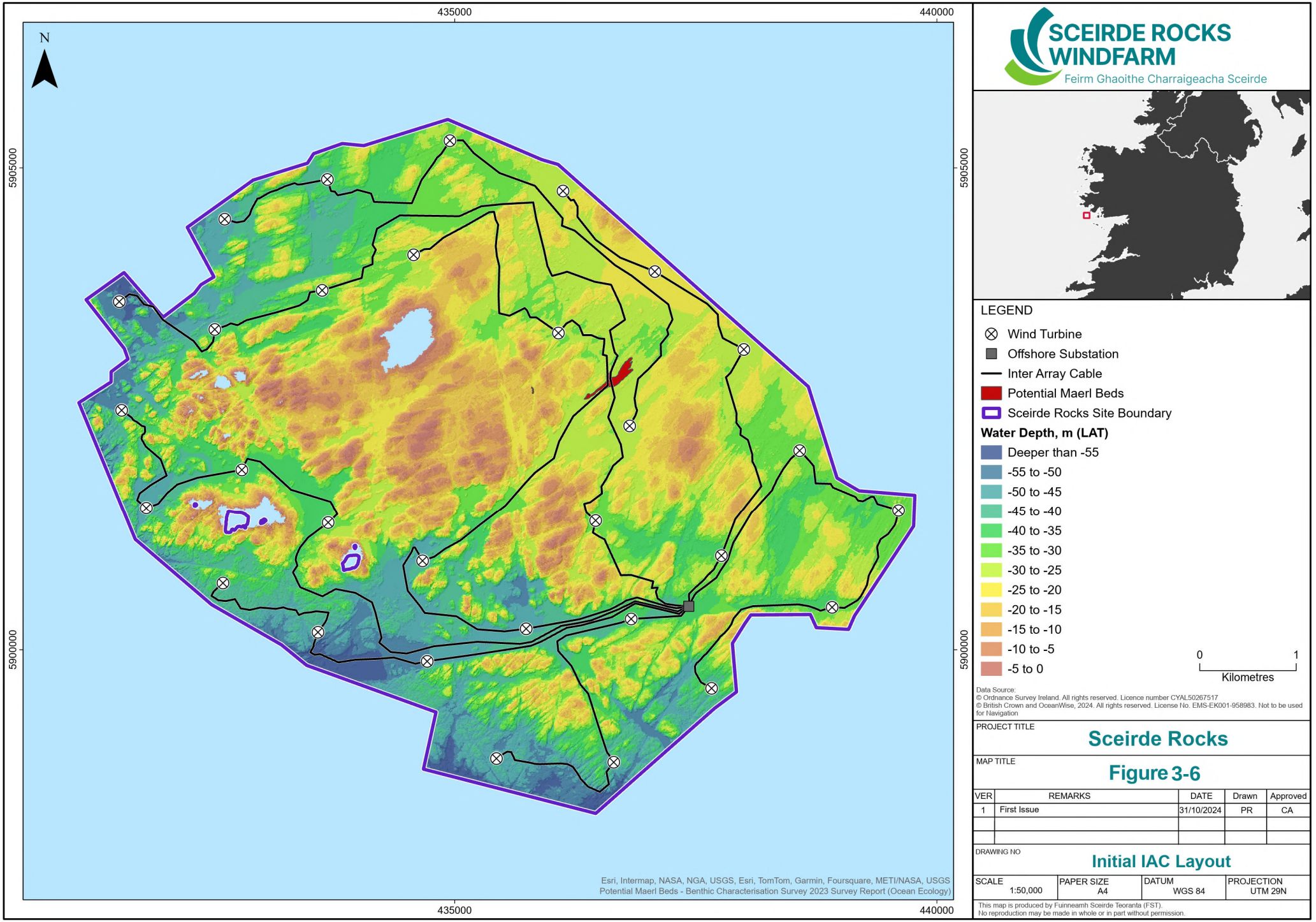
- Further reduction in export cable length
- Less restrictions on T&I and O&M with more headings available for jackup positioning
- Slight adjustment from OSS 5 to OSS 6 to allow for spacing requirements for cables

Based on the above, OSS 6 was selected and considered to be optimal in terms of the metocean conditions and its exposure to the conditions that exist on site. The chosen OSS location also provides the most efficient and economical solution in consideration of the placement of the inter-array cabling and the route of the OEC from the OSS to the Landfall Location.

3.2.5.1.5 Alternative Inter-Array Cable Route

As identified in Section 3.2.5.1.2, the inter-array cable (IAC) layouts are integral to the turbine positioning and therefore for each iteration, consideration was given to the IAC layout. Key considerations in positioning the IAC is turbine position, IAC string lengths, topography, environmental constraints, metocean constraints and instability.

Figure 3-6 below shows the initial IAC layout considered. On further review, following completion of benthic habitat mapping, it was found that this layout intersected with maerl beds identified in the benthic surveys. In order to reduce the potential environmental impact, the IAC was relocated with the chosen route now being the most optimal route which avoids the most sensitive benthic habitats (Figure 3-7).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Esri, Intermap, NASA, NGA, USGS, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS
Potential Maerl Beds - Benthic Characterisation Survey 2023 Survey Report (Ocean Ecology)
SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde
LEGEND
Wind Turbine
Offshore Substation
Inter Array Cable
Potential Maerl Beds
Sceirde Rocks Site Boundary
Water Depth, m (LAT)
Deeper than -55
-55 to -50
-50 to -45
-45 to -40
-40 to -35
-35 to -30
-30 to -25
-25 to -20
-20 to -15
-15 to -10
-10 to -5
-5 to 0
0
1
Kilometres
Data Source:
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PROJECT TITLE
Sceirde Rocks
MAP TITLE
Figure 3-6
VER | REMARKS | DATE | Drawn | Approved
1 | First Issue | 31/10/2024 | PR | CA
DRAWING NO
Initial IAC Layout
SCALE 1:50,000 | PAPER SIZE A4 | DATUM WGS 84 | PROJECTION UTM 29N
This map is produced by Fuinneamh Sceirde Teoranta (FST).
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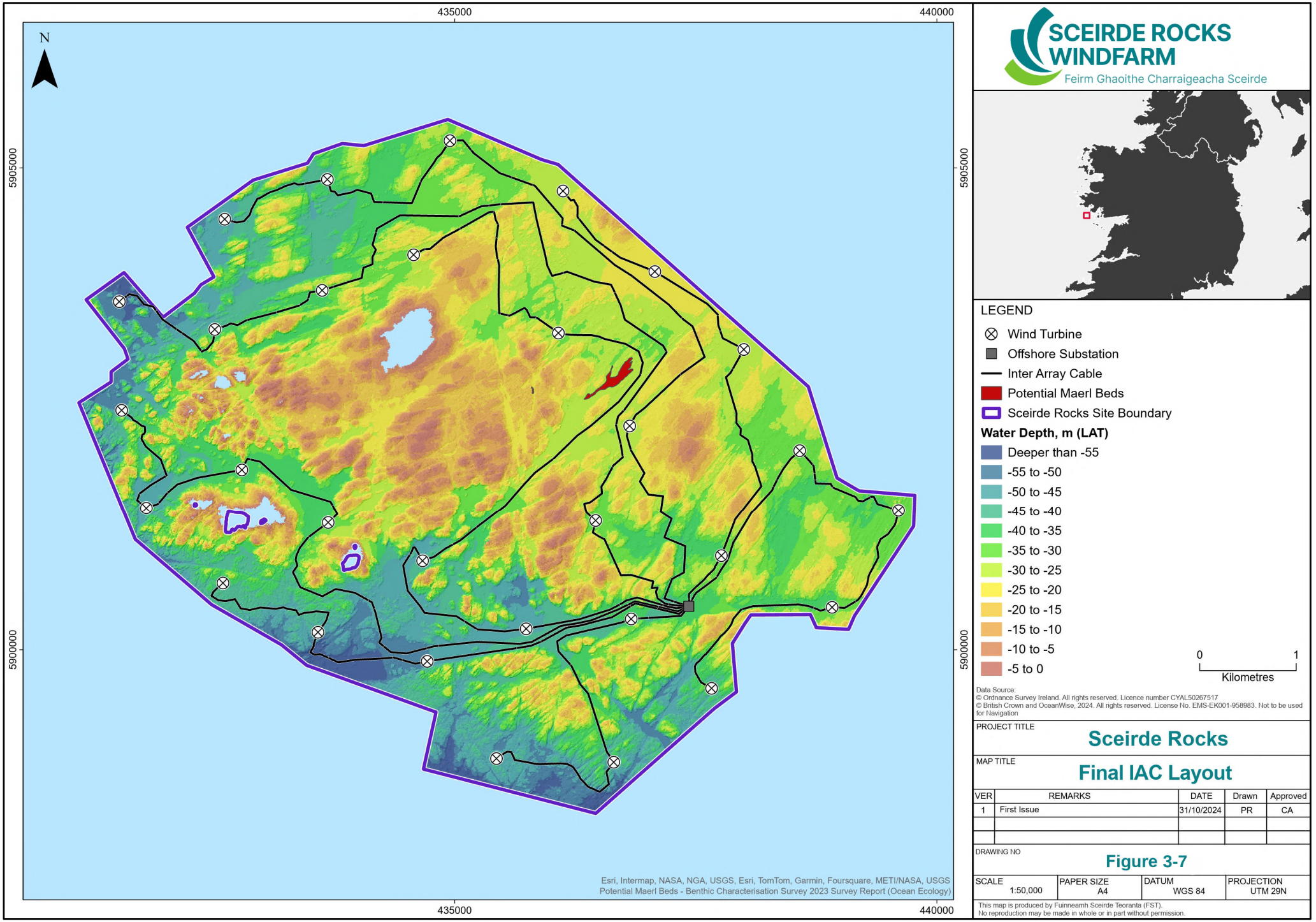
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Esri, Intermap, NASA, NGA, USGS, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS
Potential Maerl Beds - Benthic Characterisation Survey 2023 Survey Report (Ocean Ecology)
SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde
LEGEND
Wind Turbine
Offshore Substation
Inter Array Cable
Potential Maerl Beds
Sceirde Rocks Site Boundary
Water Depth, m (LAT)
Deeper than -55
-55 to -50
-50 to -45
-45 to -40
-40 to -35
-35 to -30
-30 to -25
-25 to -20
-20 to -15
-15 to -10
-10 to -5
-5 to 0
0
1
Kilometres
Data Source:
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PROJECT TITLE
Sceirde Rocks
MAP TITLE
Final IAC Layout
VER | REMARKS | DATE | Drawn | Approved
1 | First Issue | 31/10/2024 | PR | CA
DRAWING NO
Figure 3-7
SCALE 1:50,000 | PAPER SIZE A4 | DATUM WGS 84 | PROJECTION UTM 29N
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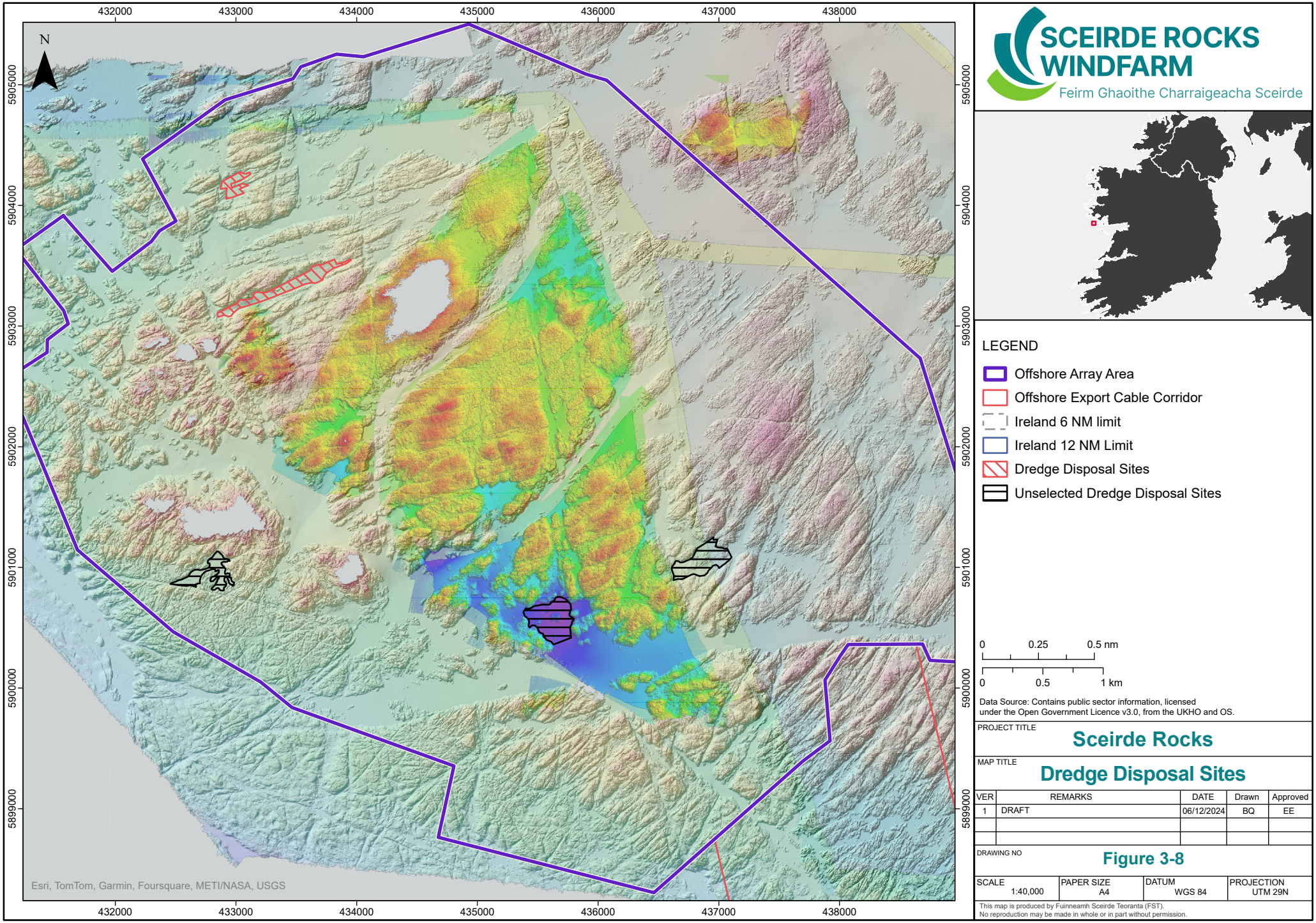
3.2.5.1.6 *Alternative Disposal Sites*

During the construction of the Offshore Site, there may be a requirement to dredge and remove superficial soft sediments to allow for a solid and level base for the turbine foundations. Therefore, there is a requirement for disposal sites within the OAA.

As show in Figure 3-8, five locations within the OAA were identified as potentially suitable for disposal of dredged material. When looking at these locations, three different constraints were considered, these were:

- EUNIS Habitats / Biotopes,
- Protected Benthic Features
- Marine Physical Processes.



On reflection of sensitivities and areas identified for the dredge disposal, there were no significant differences determined between the habitats present, with all locations being represented by a highly varied bathymetry of sediment and rocky substrata and a corresponding complex range of currents. However, locations 1 and 2 were located the furthest from the Kilkieran Bay and Islands SAC and therefore were determined lower risk to the qualifying features of the SAC.

Specific details on the chosen dredge disposal sites are included in Chapter 5, Section 5.3.1.2 of the EIAR.

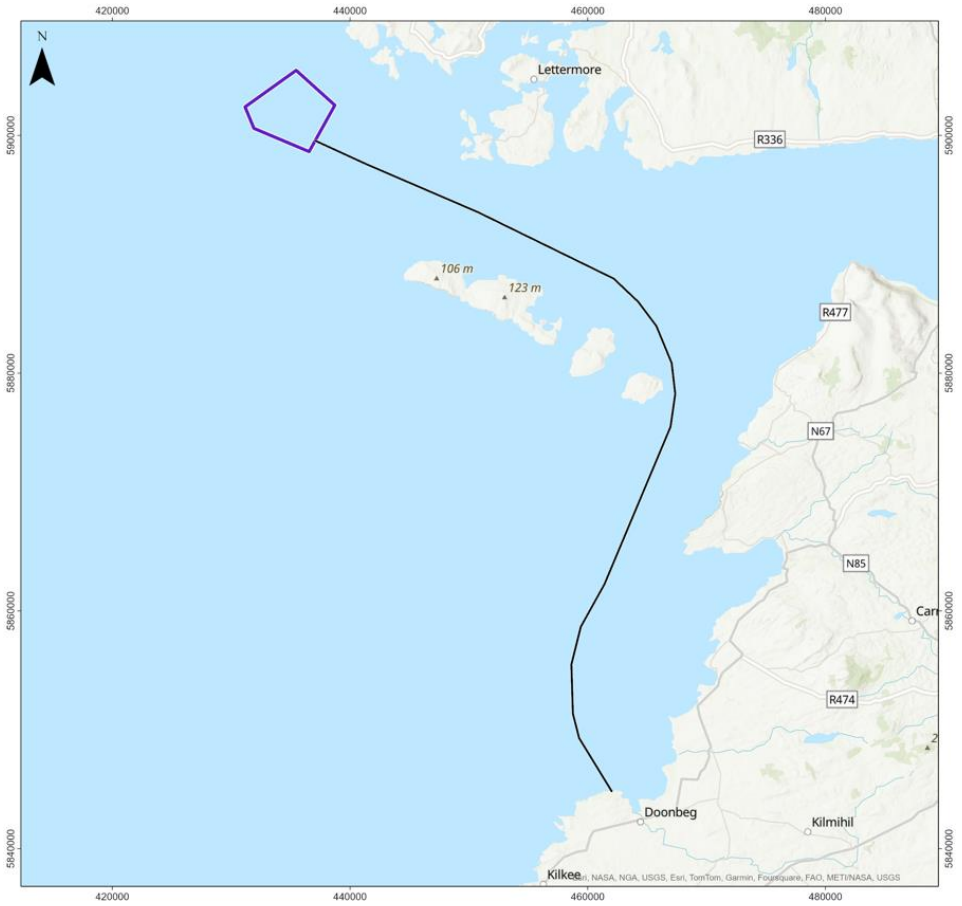
3.2.5.1.7 *Alternative Offshore Export Cable*

After the Landfall location was determined (see Section 3.2.5.1.7), the most appropriate design for the Offshore Export Cable (OEC) route was determined. A full route screening assessment was undertaken which reviewed the seabed bathymetry and topography along various offshore export cable route options as a means to determine the route that allowed for a reduced effect on the environment. Consideration of the location of the OSS position, as the starting point of the OEC, also influenced the design and route of the OEC. Two options were considered initially. Details on these are included below:

- Option 1 travels north of the Aran Islands and south onto the landfall option at Killard, and
- Option 2 travels south around Loop Head and into the landfall option adjacent to Moneypoint 220kV Substation within the Shannon Estuary.

Both options are shown in the below Plate 3-6. Option 1 travels north of the Aran Islands as it travels towards Killard. Due to the additional length of this route and its interaction with marine traffic such as ferries crossing to the Aran Islands and marine traffic travelling in and out of Galway Harbour, this route was not considered any further. Option 2, south and around Loop Head, was considered but through landfall screening, Ballynacrinnan was no longer an option based on its position in the Shannon Estuary and the potential interactions with the Lower River Shannon SAC. Option 2 was therefore no longer considered. Therefore, a more direct route, that avoids all environmentally sensitive areas was considered. This Option 3 follows a route west and south of the Aran Islands and Designated Sites (SACs and SPAs) are avoided. This route was considered optimal in minimising environmental impacts while also being the most economically viable. Full details on the route are included in Chapter 5, Section 5.8.2 and is shown on Figure 3-9 below.

OEC Option 1



OEC Option 2

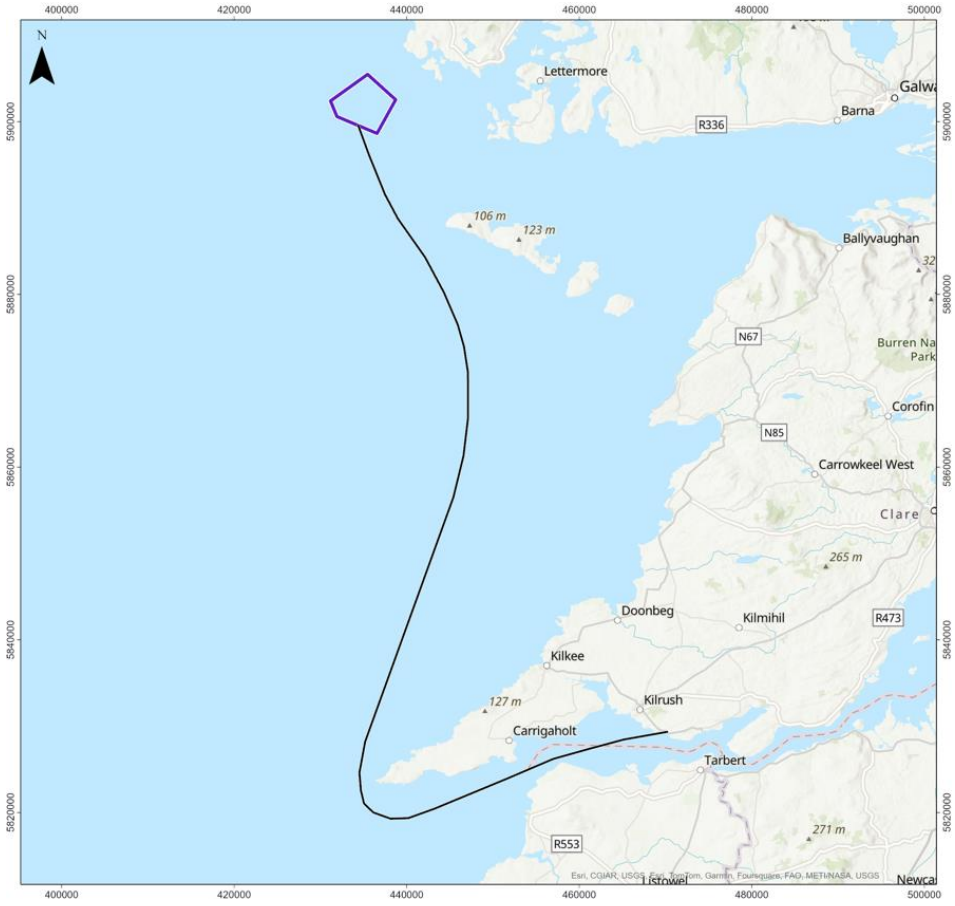
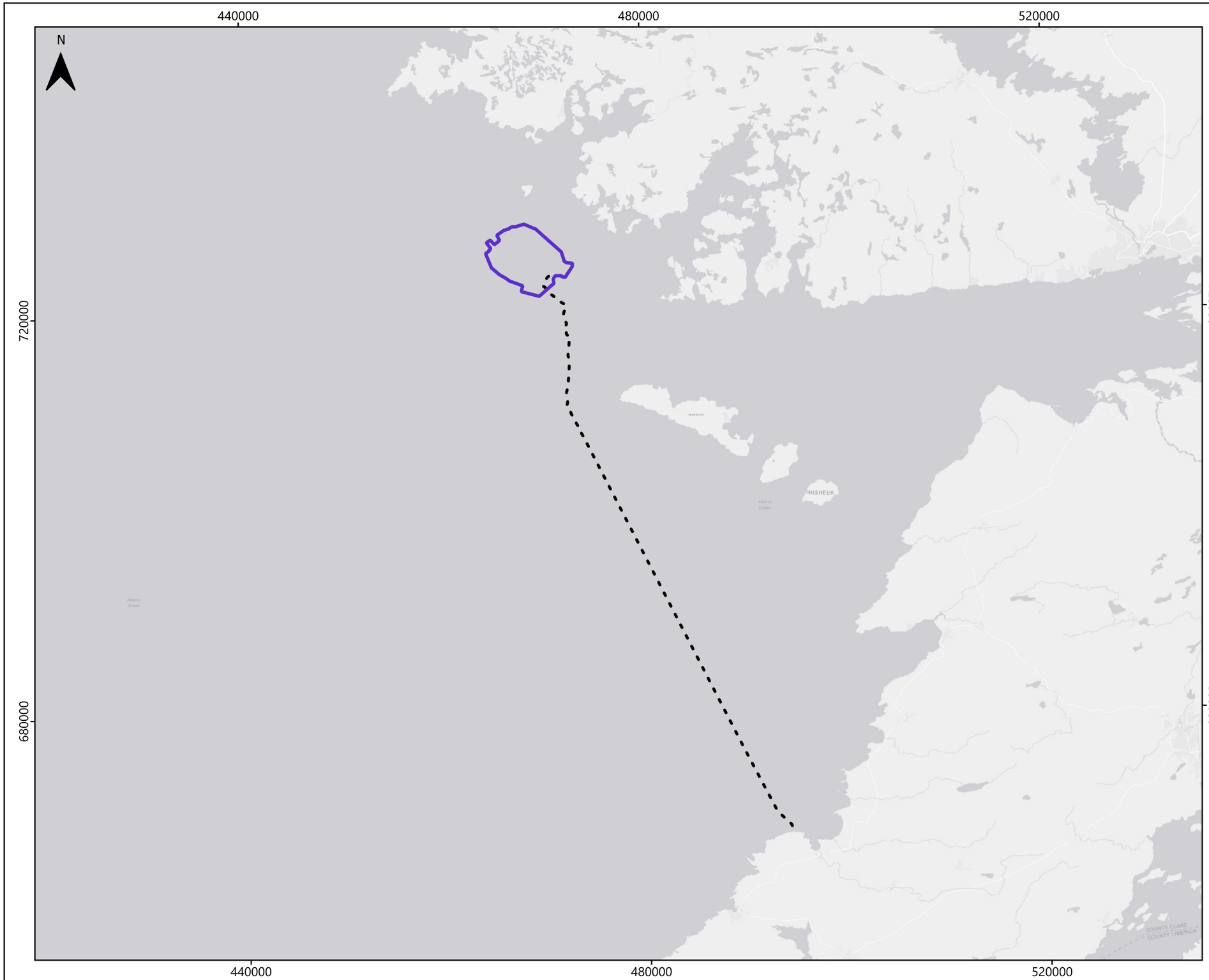


Plate 3-1 OEC Option 1 and Option 2



SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

- Offshore Array Area
- Final OEC Route

0 3 6 NM
0 6 12 km

Data Source
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PROJECT TITLE

Sceirde Rocks

MAP TITLE

Final Offshore Export Cable Route

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-15	KB	OM

DRAWING NO

Figure 3-9

SCALE	PAPER SIZE	DATUM	PROJECTION
1:450,000	A4	WGS84	UTM 29N

3.2.5.1.8 *Alternative Landfall Location*

The landfall is the location where the OEC will come ashore and represents the interface between the offshore and onshore elements of the Project. Being that the majority of the landfall works will take place within the Onshore Site, details on the alternatives considered is included in Section 3.2.5.2.1 below.

3.2.5.1.9 *Alternative Ports*

The Offshore Site components (blades, nacelles, towers, foundations) are not manufactured in Ireland and therefore must be imported from overseas, stored in a local port (known as a marshalling harbour) and transported by sea to the Offshore Site for installation. Considering the current lack of suitable port facilities in Ireland, Shannon Foynes Port, Rossaveel, Cork and Belfast harbours, along with ports in the UK and continental Europe, are all being considered as the marshalling harbour for the Project. It is noted that Irish ports have plans at various stages of implementation to provide suitable facilities for marshalling for offshore wind farms.

Prior to the installation of the GBS fixed bottom foundations, the foundations will require storage in a temporary anchorage until suitable conditions exist for final towing to and installation at the OAA. The selection of marshalling harbour and temporary anchorage locations is subject to project-specific requirements and the availability of ports and other local facilities during construction and a multi-port approach may also be considered prior to installation.

For the purposes of this assessment, Shannon-Foynes is considered as a marshalling harbour and as a potential temporary anchorage area for the Project based on location and proximity to the site, sheltered environment and sufficient area with suitable water depth to facilitate temporary anchorage.

3.2.5.2 Onshore Site

3.2.5.2.1 *Constraints and Facilitators*

The Onshore constraints map for the site was produced following a desk study of all Onshore Site constraints. Figure 3-10 encompasses the following constraints and associated buffers.

- Designated Nature and Geological Conservation Sites (SAC SPA, NHA, pNHA);
- Landscape & Visual Amenity (Local Council Designations);
- Ecological Constraints.
- Proximity to Residential Receptors (<100 m);
- Archaeology and Cultural Heritage; (National Monuments and NIAH sites);
- Forestry (Ancient & Native Woodland);
- Hydrology (River and Surface Water Flood Risk);
- Tourism and Recreation (PRoWs attractions and recreational areas) and
- Land Use

The inclusion of the constraints on a map of the Onshore Site allows for a viable Onshore Site to be identified. An initial Onshore Site with associated infrastructure is then developed to take account of all the constraints mentioned above and their associated buffer zones. Following the initial mapping of all known constraints, detailed site investigations were carried out by the Project team to inform further iterations of the design.

488000
496000
504000
664000
656000
N
Mid-Clare Coast SPA
Carrowmore Dunes SAC
White Strand/Carrowmore Marsh pNHA
Farrihy Lough pNHA
Kilkee Reefs SAC
Tullaher Lough And Bog pNHA
Tullaher Lough and Bog SAC
Poulnasherry Bay pNHA
River Shannon and River Fergus Estuaries SPA
Lower River Shannon SAC
Scattery Island pNHA
St.Senan's Lough pNHA

SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

- EIAR Site Boundary
- Onshore Grid Connection
- SAC
- SPA
- pNHA
- National Monuments
- NIAH Sites
- Forestry (Ancient and Native Woodland)
- Watercourse 50m Buffer
- Lakes 50m buffer
- Historic Surface Water Flood Risk Areas
- Recreational Routes

0 1 2 km
Kilometres

PROJECT TITLE
Sceirde Rocks

MAP TITLE
Onshore Constraints & Facilitators

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-09	CF	OM

DRAWING NO
Figure 3-10

SCALE	PAPER SIZE	DATUM	PROJECTION
1:81,000	A4	IRENET95	Transverse Mercator

In addition to the above, landscape & visual amenity designations were considered as part of the constraints mapping process. There are based on the designations set out in the Clare County Development Plan 2023-2029, which details Clare's Living Landscapes, identifying the Onshore Site as either a Working Landscape, Heritage Landscape or Settled Landscape. Further detail on this is shown in Section 14 of the Clare County Development Plan 2023–2029 Volume 1 Written Statement[3]

Residential Receptors were also considered as part of the constraints mapping process, considering residential density and a 100m buffer from any proposed grid connection route or infrastructure.

3.2.5.2.2 *Alternative Landfall Location*

As detailed in Section 3.2.3.2.3 above, following an initial coastal screening study of 14 locations as detailed in Appendix 3-1 and a determination that the Project would connect into Moneypoint 220kV Substation, a total of 4 locations were taken forward in the feasibility process and considered in further detail as potential landfall locations.

In addition, during this feasibility process, another location west of White Strand beach was also considered as an option, based on the low-lying cliff face present at the location. The potential landfall location is in the townland of Killard and has been added as landfall location number five (5) in the list of landfall locations presented below.

Consideration of technical and environmental constraints underpinned the identification of potentially suitable landfall locations for the Project as part of the previously mentioned coastal screening exercise. The onshore constraints and limitations at each potential landfall location were considered during the feasibility exercise.

The search for a landfall location mostly targeted sandy beaches to allow for open cut trenching and burial of the OEC. It was also considered necessary to minimise the interaction of technical and environmental constraints, for example areas of rock and hard substrate, designated sites, and other marine infrastructure. Following the initial identification exercise, five potential landfall locations were identified for connection to Moneypoint 220kV Substation:

1. Crag
2. Fintra Beg Beach
3. White Strand to Doonbeg Beach
4. Ballymacrinan
5. Killard

These potential landfall locations for connection into Moneypoint 220kV Substation are discussed in further detail below.

[3] *https://countydevelopmentplanreview.clarecoco.ie/stage3-amendments/adoption/volume-1-written-statement-clare-county-development-plan-2023-2029-51406.pdf*

Potential Landfall Location – Crag

Plate 3-7 - Crag Landfall Location

The offshore elements at the potential landfall location at Crag were considered technically challenging and there are limited opportunities to bury cables due to the shallow bathymetry and risk of exposed rock on approach to the landfall. The presence of Annex I Reef habitats and Article 17 habitats overlap with the landfall area, presenting an ecological risk. Additionally, Option 1 overlaps with nursery grounds and spawning grounds for marine species, shellfish production areas, and commercial fishery grounds.

This option would have required the longest proposed onshore cable route from the landfall location to the National Grid at Moneypoint, at approximately 35 km. The potential landfall location is also distant from any sizable road network. The Clooneyogan River also flows through the location.

Potential Landfall Location – Fintra Beg Beach

Plate 3-8 Fintra Beg Beach Landfall Location

Similar to Crag, technical challenges exist due to the shallow bathymetry and potential for exposed rock and hard substrate on approach to the landfall. Annex I Reef habitats overlap with this location, as well as nursing and spawning grounds for several species. There are also areas of net and pot fishing, and the location overlaps with shellfish production areas.

This option would have required the second longest proposed onshore cable route from the landfall location to Moneypoint, at approximately 29 km. Fintra Beg is a Blue Flag beach, meaning that it meets the Foundation for Environmental Education's standards for environmental management. It is located on the Wild Atlantic Way and is popular with tourists and local residents. There is a mobile home/caravan park located in close proximity to the landfall location.

Potential Landfall Location – White Stand to Doonbeg Beach

Plate 3-9 White Strand to Doonbeg Beach Landfall Location

Similar to the above routes, technical challenges exist due to the shallow bathymetry and potential for exposed rock and hard substrate on approach to the potential landfall location. Offshore, this option overlaps with the Mid-Clare Coast SPA, and is adjacent to Carrowmore Dunes SAC. Annex I Reef habitats also overlap the potential landfall location. In addition, this option overlaps shellfish production areas, as well as areas of bottom trawl fishing and pot fishing. There are nursery and spawning grounds for several marine species.

Onshore, there is a National Monument (promontory fort) located on White Strand. This location is within Mid Clare Coast SPA, and there are several Article 17 habitats located on and between the two beaches. The local road network is predominantly single lane.

Potential Landfall Location – Ballymacrinan

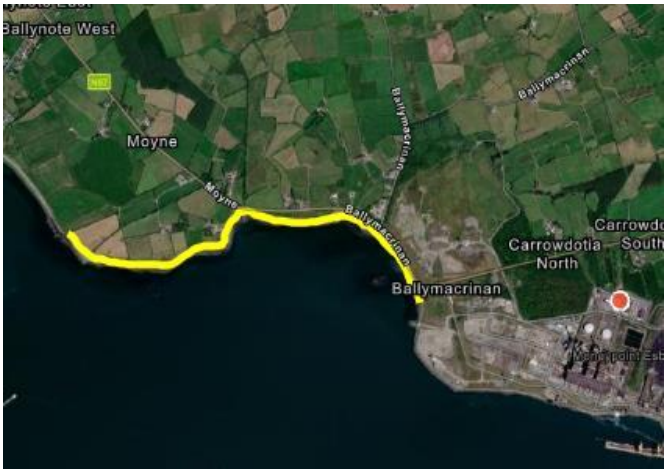

Plate 3-10 Ballymacrinan Landfall Location

This potential landfall location also highlighted technical difficulties as allowed for the largest distance of approximately 119 km between the OSS and the potential landfall location. The location overlaps with the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA, as well as Annex I Reef habitats, Article 17 habitats and nursing and spawning grounds for several species. The potential landfall location is within Shannon Harbour limits and has high shipping density associated with Shannon Harbour and Moneypoint Power Station. The location overlaps with shellfish production areas and an aquaculture site.

The onshore elements at this potential landfall location also overlap with the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA, as well as Article 17 Estuaries. The Molougha River flows directly into the estuary.

Potential Landfall Location - Killard

Following a review of the potential landfall locations detailed above, the preferred landfall location was identified as the White Strand to Doonbeg Beach option. After further assessment of this location and in order to avoid and minimise the constraints identified above, it was decided to consider a potential landfall location approximately 1.1 km west at a location in the townland of Killard. The chosen location avoids overlap and any direct contact with the Mid-Clare Coast SPA, Carrowmore Dunes SAC, and Article 17 habitats. The location also avoids impacts to White Strand, a Blue Flag Beach, and the environmental management standards associated with the Blue Flag award will not be affected. There will be no impacts to the recreational amenities provided at the beach. The National Monument located on the White Strand will also be avoided.

Summary

On review of the potential landfall options, the potential landfall location at Killard was shown to be the least environmentally constrained and the most technically viable. It was therefore taken through as part of the Project. Further detail on this location is included in Section 5.3.2.1 of Chapter 5.

3.2.5.2.3 *Alternative Onshore Grid Connection*

Connection of the Project to the national grid is a crucial element of the project, as without a viable grid connection, the offshore renewable energy development cannot operate. The distance from any renewable energy development site to the likely grid connection point, the extent and cost of grid upgrades required to facilitate the connection of the renewable energy development, the delay in having those reinforcement works undertaken, are all critical factors that could render a renewable energy development project commercially viable or unviable.

As detailed in Section 3.2.3.2 above, following an initial coastal screening study, the option to connect to Moneypoint 220kV Substation in Co. Clare was chosen over the use of Cashla 220kV Substation, in Co. Galway. Therefore, on review of the potential grid connection options, only options from Crag, Fintra Beg Beach, White Strand to Doonbeg Beach, Ballymacrinan and Killard were considered as starting points for the grid connecting into Moneypoint 220kV Substation.

Consideration of technical and environmental constraints underpinned the identification of potentially suitable onshore grid connection routes for the Project as part of the previously mentioned grid

feasibility exercise. The onshore constraints and limitations along each onshore grid option were considered during the feasibility exercise. In addition to the constraints study, the project team also considered additional aspects such as environmental constraints, the population density and the likely disruption during the construction stage.

The potential 220kV grid connection route went through numerous iterations as show in Figure 3-11 below, considering different in-road option and off-road underground cable options as well as the potential to connect to the grid by overhead line. A full review of the options is detailed in *Appendix 3-2 – Onshore Grid Route Feasibility*. Criteria included in the feasibility reports included:

- Technical Constraints;
- Eirgrid Policy which recommends cables in the road network rather than in third party lands, to aid operational access and maintenance;
- Designated Nature and Geological Conservation Sites (SAC SPA, NHA, pNHA);
- Landscape & Visual Amenity (Local Council Designations);
- Ecological Constraints;
- Proximity to Residential Receptors (<100 m);
- Archaeology and Cultural Heritage;
- (National Monuments and NIAH sites);
- Forestry (Ancient & Native Woodland);
- Hydrology (River and Surface Water Flood Risk);
- Tourism and Recreation (PRoWs attractions and recreational areas) and
- Land Use

On review of the above, and completion of the feasibility assessment, an appropriate onshore grid connection route mostly targeted the existing road network. This is based on Eirgrid Policy where it is more appropriate to place cable in the road than in third party lands, to aid operation and maintenance. In addition, when comparing the constraints, the final underground cable route as presented in Figure 3-11 takes account of all site environmental constraints (e.g., ecology, archaeology, hydrology, peat depths etc.) and design constraints (e.g., third party lands). The main constraint that allowed the route to be progressed was the length of cable. The route from Killard allowed for the shortest route, which therefore reduced the environmental effects overall. In addition, the route avoids all villages and towns, including the main hub of Kilrush, which reduced the impacts on residents, tourism, services and recreation within this area.

Based on the above chosen route from Killard, and taking into account the findings from the site investigations and baseline assessments that have been carried out during the EIAR process the underground cable route design was finalised (termed the Onshore Grid Connection (OGC)) as shown in Figure 3-12. A full description of the OGC is included in Chapter 5, Section 5.3.2.2.

480000 490000 500000 510000 520000

680000 670000 660000

N

Crag

Fintra Beg Beach

White Strand to Doonbeg Beach

Killard

Moneypoint 220kV Substation

Ballymacrinan

0 2.5 5 km

SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

Crag
- Off Road Route - Crag
- Road Route - Crag
- 400kV line
- Moneypoint

Fintra Beg Beach
- Off Road Route - Fintra Beg
- Road Route - Fintra
- 400kV line
- Moneypoint

White Strand Beach
- Off Road Route - White Strand
- Road Route - White Strand
- 400 kV line
- Moneypoint A
- Moneypoint B

Killard
- Road Route - Killard

Ballymacrinan
- Ballymacrinan Landfall Option

Overhead Lines
- 400kV

- Landfall Locations

PROJECT TITLE

Sceirde Rocks

MAP TITLE

Onshore Grid Connection Route Options

VER	REMARKS	DATE	Drawn	Approved
V1		2025-01-16	KB	OM

DRAWING NO

Figure 3-11

SCALE	PAPER SIZE	DATUM	PROJECTION
1:185,000	A4	IRENET95	Transverse Mercator

488000 496000 504000

664000

656000

N

Doonbeg

Kilkee

Kilrush

Moneypoint 220kV Substation

0 1 2 km

Kilometres

SCEIRDE ROCKS WINDFARM

Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

Onshore Grid Connection (OGC)

Onshore Compensation Compound Location

PROJECT TITLE

Sceirde Rocks

MAP TITLE

Final Onshore Grid Connection Route

VER	REMARKS	DATE	Drawn	Approved
V1		2024-12-01	KB	ÓM
V2		2025-01-12	KB	ÓM

DRAWING NO

Figure 3-12

SCALE	PAPER SIZE	DATUM	PROJECTION
1:80,000	A4	IRENET95	Transverse Mercator

3.2.5.2.4 *Alternative Onshore Compensation Compound*

Once the landfall location and the OGC into Moneypoint 220kV Substation were confirmed, it was necessary to determine the location and configuration options for the Onshore Compensation Compound.

A 2.5km search area around Moneypoint 220kV Substation was considered, to ensure that the proposed substation would be located within close proximity to the connection point at Moneypoint. This boundary is shown below in Figure 3-13.

The following technical requirements and environmental constraints were considered:

- Proximity to Moneypoint 220kV Substation. The Onshore Compensation Compound should be located in close proximity to Moneypoint 220kV Substation to minimise the amount of infrastructure required to interconnect the two substations and thus reduce electrical losses ;
- Suitable access from the local road network;
- Capability of the location to accommodate different possible electrical layouts of the substation;
- Onsite environmental constraints, such as water crossings, heritage features, etc.
- Land availability
- Minimising impacts on key visual receptors and residential properties.

Following a review of the above, there was only one site that was identified as being suitable when consideration was given to land availability, environmental sensitives; with none being identified within the chosen location, as well as technical constraints i.e. the site had suitable soil conditions and no steep slopes.

SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde

LEGEND

- Onshore Compensation Compound (OCC)
- Moneypoint 220kV Substation
- 2.5km Buffer from Moneypoint 220kv Substation

0 1 2 km
Kilometres

PROJECT TITLE
Sceirde Rocks

MAP TITLE
Compensation Compound Search Area

VER	REMARKS	DATE	Drawn	Approved
VX		2025-01-09	NM	OM

DRAWING NO
Figure 3-13

SCALE	PAPER SIZE	DATUM	PROJECTION
1:49,000	A4	IRENET95	Transverse Mercator

3.2.5.2.5 *Temporary Construction Compound Considerations*

As part of the Project design and requirement during the construction phase, temporary construction compounds are needed onshore. A number of locations were considered for the proposed temporary construction compounds within the Onshore Site.

Various locations along the OGC were considered where the construction team would be able to utilise areas adjacent to the cabling and joint bay areas. Consideration was given to areas that already had existing access, infrastructure or a hardstanding present, as means to reduce any environmental effects. This reduced the proposed works required to access the temporary construction compounds. Although a few options were considered along the OGC, the preferred options were the Landfall area, the Kilrush Golf Club and the area within the Onshore Compensation Compound, as infrastructure was already being proposed there as part of the Onshore Site. Proximity to proposed infrastructure, in particular the Onshore Landfall Location and Onshore Compensation Compound, existing surfacing at Kilrush Golf Club along with no significant environmental constraints at any of the three potential compound locations made these suitable locations for temporary construction compounds.

3.2.6 Alternative Mitigation Measures

Mitigation by avoidance has been a key aspect of the Project's evolution through the selection and design process. Avoidance of the most ecologically sensitive areas and geotechnically unstable areas of the Offshore Site and the Onshore site limits the potential for environmental effects. As noted above, the layout aims to avoid any environmentally sensitive areas.

The best practice design and mitigation measures set out in this EIAR will contribute to reducing any risks and have been designed to break the pathway between the site and any identified environmental receptors. The alternative is to either not propose these measures or propose measures which are not best practice and effective and neither of these options are viable.

3.2.7 Alternative Construction Methodologies

3.2.7.1 Offshore Site

In addition to the alternative design components, alternative construction and installation methods for the Offshore Site infrastructure have been considered. It should be noted that construction methodologies are intrinsically linked to design. Reference to this is made below where required.

3.2.7.1.1 *Piling*

An alternative to installation of GBS fixed bottom foundations at the Offshore Site would be use monopile foundations and construct the foundations by piling. Using a piling technique to drill into the seabed has the potential to introduce high amplitude impulsive sound into the marine environment. This was considered to be a potentially impactful for receptors such as marine mammals or fish which may be sensitive to noise. Therefore this construction methodology was no considered any further at the Offshore Site.

3.2.7.1.2 *GBS Stonebed Supply*

As previously detailed, Gravity-Based Structures (GBS) were determined to be most suitable foundations for the Project. The GBS will require a stonebed to be placed on the seabed prior to positioning the GBS in place. A number of rock quarries, within a feasible distance from the site, are being considered for the installation of the stonebed material. Glensanda in Scotland has been

preliminary selected as a base case option. This is one of the largest granite quarries in Europe and produces high-quality aggregates. The Project is also discussing the feasibility of supplying suitable rock from local quarries in Ireland.

3.2.7.1.3 *Blasting*

An alternative to installation of stonebed material to produce an even surface for proposed infrastructure, would be to implement blasting activities at the Offshore Site. Using a blasting technique to clear rock outcrops has the potential to introduce high amplitude impulsive sound into the marine environment. This was considered to be a potentially impactful for receptors such as marine mammals or fish which may be sensitive to noise. Therefore this construction methodology was no considered any further at the Offshore Site.

3.2.7.1.4 *Trenchless technology vs trenching for Landfall*

An alternative to the installation of the OEC by trenchless technology would be to consider a trenched approach at the Landfall. Cable trenching by open-cut trench is appropriate where the seabed is relatively shallow and can be excavated from a barge or tracked excavator on the beach. It is generally used where there is low coastal ridge that can be trenched and excavated easily, rather than a cliff face or a steep shoreline. Given the location and the conditions at the Landfall including the existing topography of the cliff face, developing a trench is not a viable option, and a trenchless approach was therefore proposed.

3.2.7.2 Onshore Site

3.2.7.2.1 *OEC Cable Laying Methodology*

Use of standard trenching was the preferred method along the OGC. Areas of peat where identified as being located within the local road network. Due to environmental constraints, it was determined that standard trenching methodology would not be appropriate, and the most environmentally sensitive methodology would be to adopt a trenchless HDD method for installing these sections of OGC. This is further detailed in Chapter 5, Section 5.8.2.