Orkney's Community Wind Farm Project - Faray

Environmental Impact Assessment Report –

Non-Technical Summary

June 2021

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Contents

Abbreviations

AOD	Above Ordnance Datum
BPEO	Best Practical Environmental Options
BNG	British National Grid
CIEEM	Chartered Institute of Ecology and Environmental Management
CEMP	Construction Environmental Management Plan
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
EoI	Expressions of Interest
FeAST	Feature Activity Sensitivity Tool Green House Gasses
GWDTEs	Groundwater Dependent Terrestrial Ecosystems
GVA	Gross Value Added
ha	Hectare
HIAL	Highlands and Islands Airports Ltd
IEF	Important Ecological Features
JNCC	Joint Nature Conservation Committee
LCCAs	Local Coastal Character Areas
LCU	Landscape Character Unit
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MOD	Ministry of Defence
MS-LOT	Marine Scotland's Marine Licencing Team
MW	Megawatt
NLB	Northern Lighthouse Board
NMPi	National Marine Plan interactive
NTS	Non-Technical Summary
NSR	Noise Sensitive Receptors
NVC	National Vegetation Classification
OEMP	Operations Environmental Management Plan
Ofgem	Office of Gas and Electricity Markets
OIC	Orkney Islands Council
OS	Ordnance Survey
PMF	Priority Marine Feature
PSA	Particle Size Analysis
PTS	Permanent Threshold Shift

PVR	Principal Visual Receptors
PWS	Private Water Supplies
RCCA	Regional Coastal Character Area
RVAA	Residential Visual Amenity Assessment
SAC	Special Area of Conservation
SEPA	Scottish Environmental Protection Agency
SHE-T	Scottish Hydro Electric Transmission
SNH	Scottish Natural Heritage
SSSI	Site of Special Scientific Interest
TTS	Temporary Threshold Shift
ZTV	Zone of Theoretical Visibility

1 Background

1.1 This document is a Non-Technical Summary of Orkney's Community Wind Project - Faray Environmental Impact Assessment (EIA) Report which supports the application by Orkney Islands Council (the Applicant) for the development of a wind farm (the Proposed Development) on the island of Faray, Orkney.

1.2 The EIA Report supports the following consent applications for the Proposed Development:

- A planning application to Orkney Islands Council (OIC) under The Town and Country Planning Act (Scotland) 1997 (as amended) for all works above Mean Low Water Springs (MLWS), i.e. the onshore wind turbines and associated infrastructure above MLWS.
- Marine Licence applications to Marine Scotland's Marine Licencing Team (MS-LOT) for works below Mean High Water Springs (MHWS), i.e. the installation of improved access to Faray via construction of a new extended slipway and landing jetty. Two marine licences are required, one for construction works and one for dredging operations.

Background and Needs Case Considerations

1.3 The Proposed Development is one of three under development by the Applicant under Orkney's Community Wind Farm Project. The aims of this project are threefold;

- to generate income to be used for the benefit of the people of Orkney;
- to aid towards a meaningful response to the Climate Emergency and the urgent need to further decarbonise; and
- to build the case for a new transmission connection for Orkney and unlocking wider benefits to the energy sector in Orkney.

1.4 In addressing these aims the scale of development is a critical issue. At present, Orkney is not served by a transmission grid connection and the distribution network is at capacity such that there has been a moratorium on new grid connections since 2012 and many operational wind energy projects are experiencing substantial constraint through an Active Network Management system. Whilst the moratorium was technically lifted in September 2020 there is no material change to the overall level of constraint in Orkney and it is not considered that any substantial project will be able to secure a grid connection with acceptable curtailment levels. The lack of grid capacity has driven some innovation locally, but the overall impact has been to heavily impede development of the energy industry.

1.5 In September 2019 the electricity market regulator Ofgem published its final decision on the Needs Case for a transmission connection linking Orkney to the Scottish Mainland. It determined that there is a need for a cable. To justify the required spending on a new cable, there is a requirement for Scottish Hydro Electric Transmission (SHE-T) to demonstrate that there will be sufficient generation capacity to connect to the new cable, once operational. The transmission link would have substantial economic benefits, with potential Gross Value Added (GVA) for the Orkney economy of between £371 million and £807 million, since it would enable the further development of the renewable energy sector in Orkney.

1.6 Ofgem agreed that in order to trigger a new 220 MW connection, 135 MW of new generation is required to have obtained planning permission, signed up to a grid connection agreement, and passed a financial audit before the end of 2021. Currently less than 40 MW of new wind has gained planning permission. Noting that there are a number of other private projects at different stages of development, it is clear that, without the Proposed Development and the other two wind farms within 'Orkney's Community Wind Farm Project', it is unlikely that the threshold will be met, and a new interconnector will not be built.

1.7 In terms of delivering community benefit to the people of Orkney there are currently substantial challenges around funding service provision in the area which Orkney's Community Wind Farm Project may be able to address provided income from the Project is of the scale required.

1.8 In order to maximise the local benefit from the proposed 220 MW cable, it is also considered desirable to ensure that as much of the generation as possible is taken into local or public ownership, thereby ensuring that profits stay within Orkney.

1.9 Developing all available sites with a realistic chance of contributing towards the Needs Case for a new cable to their realistic maximum capacity is viewed as the best way of ensuring that the aims outlined above are achieved.

Site Selection

1.10 In response to the OIC decision to seek landowners with an interest in selling or renting land for wind farm development, an Expressions of Interest (EoI) process was undertaken in August and September 2017 inviting landowners to get in touch with OIC. A number of responses were received, and each was assessed against defined criteria and compared against other sites received, and sites within OIC ownership.

1.11 Initial baseline survey work at a potential large-scale site which would potentially deliver the entire 108 MW capacity was undertaken in 2018 however based on preliminary findings it was considered that a single development of that scale was unlikely to be achievable in Orkney. A process was therefore undertaken in late 2018 to assess the whole of Orkney for the potential for onshore wind farm development at a smaller scale, which could, in combination, provide the required capacity to support the Needs Case.

1.12 This was done by buffering address point data and plotting international designated sites on a map and identifying those areas which were of sufficient size to host a wind farm and were not constrained by either of those limitations. Each site was then investigated in further detail to identify any additional potential constraints. A short list of sites was drawn up and a full assessment of suitability was undertaken, the results of which were used to inform a report to OIC.

1.13 The island of Faray was identified as a potentially suitable development site, and further work was undertaken to establish feasibility of development and the potential scale and capacity of potential wind energy generation at the site. Further details can be found in Chapter 2 (Design Iteration) of the EIA Report.

2 Purpose of the Proposed Development EIA Report

2.1 ITPEnergised (ITPE) was appointed by the Applicant to undertake an EIA of the Proposed Development in accordance with The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 ('the EIA Regulations') and the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended). The EIA process is the systematic process of identifying, predicting and evaluating the environmental impacts of a proposed development.

2.2 The EIA process is reported in Chapter 4 (Approach to EIA) of the EIA Report, which identifies the methodologies used to assess the environmental effects predicted to result from the construction and operation of the Proposed Development. Where appropriate, it also sets out mitigation measures designed to prevent, reduce and, if at all possible, offset likely significant adverse environmental impacts (refer to Chapter 19 Schedule of Environmental Commitments) and individual technical assessments). An assessment of residual effects, those expected to remain following implementation of mitigation measures, is also presented (refer to Chapter 20 Summary of Residual Effects and individual technical assessments).

3 Availability of the Proposed Development EIA Report

3.1 In line with the Town and Country Planning (Miscellaneous Temporary Modifications) (Coronavirus) (Scotland) Regulations 2020 that came into place on the 24th April 2020, and the Marine Works and Marine Licensing (Miscellaneous Temporary Modifications) (Coronavirus) (Scotland) Regulations 2020, hard copies may not be available for inspection at public locations. Electronic copies will however be available online. In addition, all documents are available (as a PDF for screen viewing only) on a USB for £15.00 or as a hard copy for £1,600.00 (including printing and distribution).

4 Representations to the Application

4.1 Any representations to the applications should be made directly to the relevant consenting authorities:

- Representations to the planning application should be made to OIC Development Management at: planning@orkney.gov.uk
- Representations to the marine licence applications should be made to MS-LOT at: ms.marinelicensing@gov.scot

5 Site Location and Description

5.1 The site comprises the island of Faray, an uninhabited island to the north and west of Eday and south-east of Westray in the Orkney Islands. A smaller island, Holm of Faray, is immediately to the north. Faray is approximately 17 km north-east of the Orkney Mainland, and approximately 25 km from Kirkwall. The island extends to approximately 168 hectares (ha) and is centred on British National Grid (BNG) 353112, 1036752 (refer to Figure 1).

5.2 The topography of the island comprises two low hills. The southern of the two forms approximately the central point of the island, rising to 32 m Above Ordnance Datum (AOD). Approximately 700 m to the north a second hill rises to 31 m AOD. The ground level falls away fairly gently from the two hills, the steepest slope being near the coast to the west of the southern hill. The coastline is generally defined by rocky cliffs with geos and caves, except on the west coast near the north of the island and on the far south-east coast, where there are stretches of beach.

5.3 The island comprises open fields of improved pasture, a number of abandoned buildings and a slipway. The current land use is sheep farming.

5.4 There are no major surface watercourses on the island. There are however, two springs located near the centre of the island from which a small stream flows west towards the sea.

5.5 There are no residential properties within the site boundary. The closest dwelling is North Guith c.1.6 km east of the nearest proposed turbine.

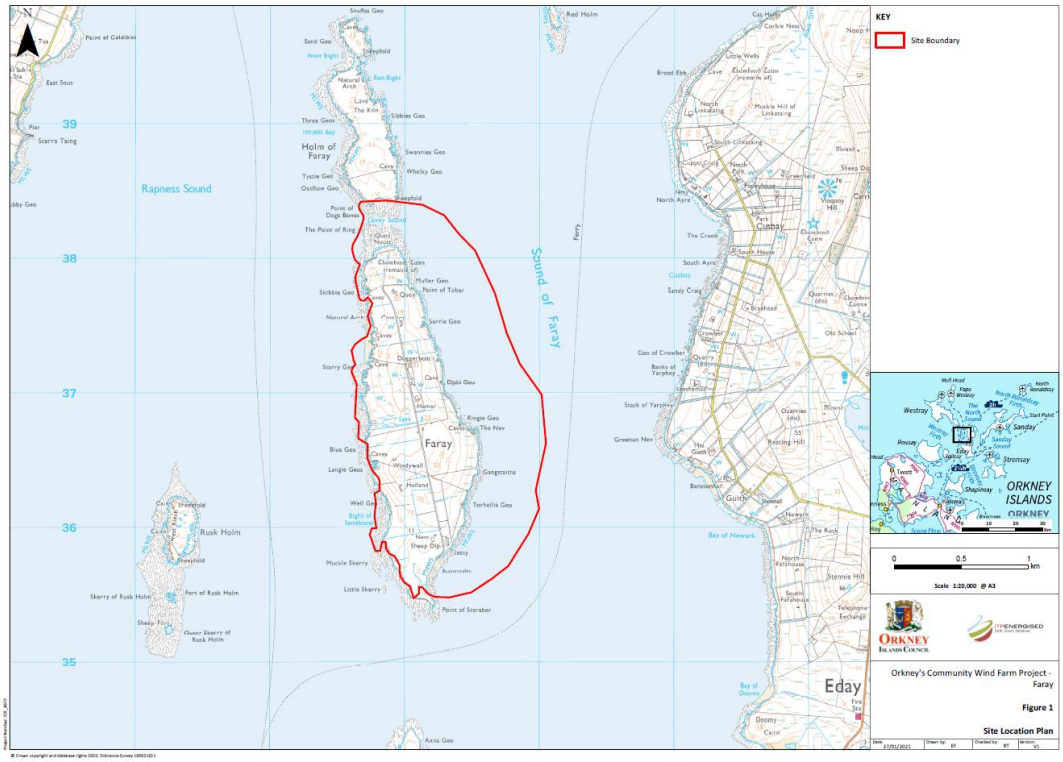

Figure 1 - Site Location

6 Key Designations

6.1 Nature Conservation sites in relation to Faray are shown in Figure 2. The coast of Faray and the island of Holm of Faray to the north is designated as the Faray and Holm of Faray Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI). The site is designated for grey seals and supports the second largest breeding colony of grey seals in the UK.

6.2 Numerous bird and mammal species have been recorded within the area. In addition to grey seals, the following species of key conservation value have been recorded within the area: raptors, owl, and otters. One count of harbour seal was recorded during site surveys, with the Sanday SAC, which is designated for harbour seals, located 10.7km to the east. Numerous cetaceans (whales, dolphins and porpoises) have the potential to be within the wider area including common dolphin, bottlenose dolphin, Atlantic white-sided dolphin, orca, long-finned pilot whale, minke whale, Risso's dolphin, white-beaked dolphin, harbour porpoise and baleen whales.

6.3 There is one Scheduled Monument located towards the north of the site, the Quoy Chambered Cairn.

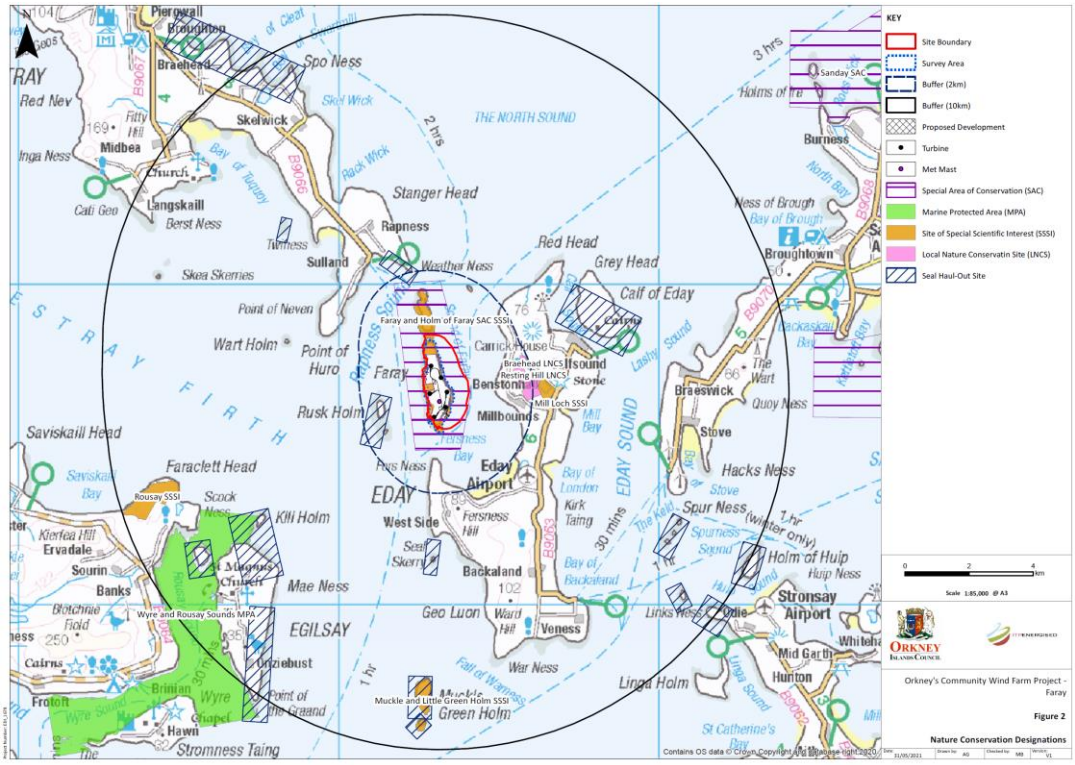

Figure 2 - Nature Conservation Designations

7 Design Process

7.1 The design of the Proposed Development has undergone several iterations of turbine and infrastructure layout. It has taken into consideration factors including comments received from consultees, environmental constraints, visual effects and landscape character. The following principles were adopted during the design iterations to ensure that the final design was the most suitable for the site:

- maximising wind yield and maintaining adequate spacing between turbines;
- avoiding inconsistent turbine spacing, such as relatively large gaps, outliers or excessive overlapping of turbines to minimise visual confusion and ensure a balance / compact array from key views;
- keeping the proposed turbines sufficiently inset so as not to encroach on the coastal edge and to ensure turbines appear contained on the island;
- minimising works within the SAC and SSSI and minimising potential effects;
- maintaining a suitable distance from the Scheduled Monument;
- maintaining a suitable distance from seabird nests;
- minimising impacts in respect of noise and the visual amenity of residential properties;
- minimising impacts on non-designated cultural heritage assets; and
- maintaining a suitable distance from drainage ditches and springs.

7.2 The Proposed Development layout put forward in the EIA Report is considered to represent the most appropriate viable design while maximising the renewable electricity generation from the site. The process of design iteration is explained fully in Chapter 2 (Design Iteration) of the EIA Report.

8 Description of the Development

The Proposed Development

8.1 The Proposed Development would consist of six wind turbines of up to a maximum of 149.9 m height from ground to blade tip when vertical. The overall capacity of Proposed Development would be approximately 28.8 MW[1]. A number of ancillary elements are also proposed, including access tracks, crane hardstandings, underground cabling, possible external transformers, on-site substation and maintenance building, temporary construction compounds, borrow pits, permanent meteorological mast, a new extended slipway and a landing jetty. The proposed site layout is shown in Figure 3.

8.2 The proposed locations of the turbines have been identified in order to enable the EIA to assess fully the Proposed Development for which permission is being sought. The British National Grid coordinates denoting where each of the turbines are proposed to be located are listed in Table 3.1 of Chapter 3 (Proposed Development).

8.3 Whilst the location of the infrastructure described above has been determined through an iterative environmental based design process, there is the potential for these exact locations to be altered through micro-siting allowances prior to construction. A micro-siting allowance of up to 50 m in all directions is being sought in respect of each turbine and its associated infrastructure in order to address any potential difficulties which may arise in the event that preconstruction surveys identify unsuitable ground conditions or environmental constraints that could be avoided. No micro-siting will be undertaken that results in an increase in the significance of adverse effects. It is proposed that the micro-siting of all infrastructure will be subject to an appropriately worded planning condition.

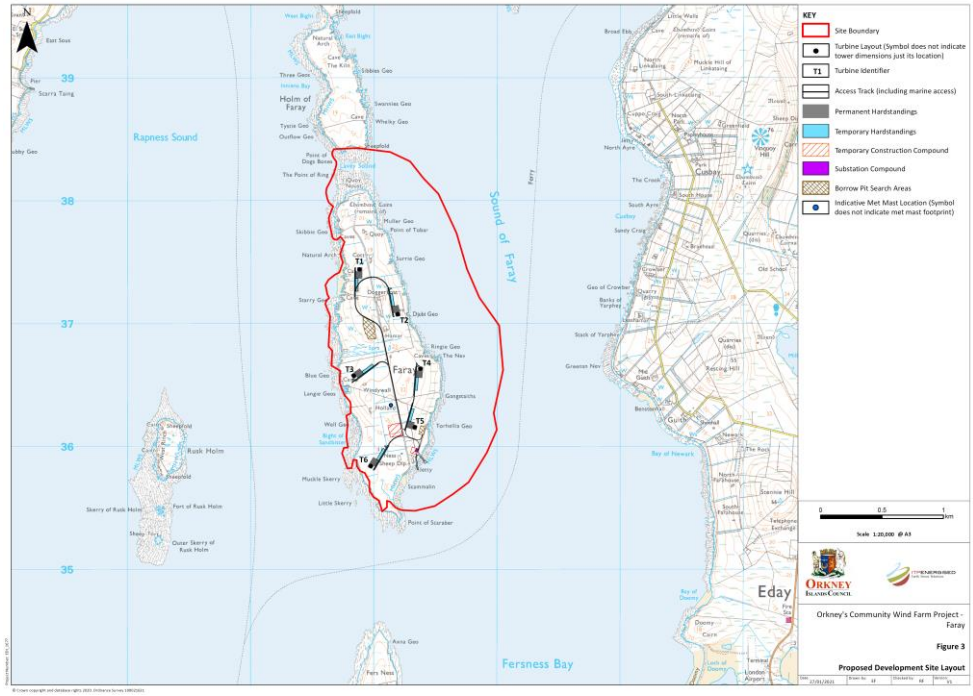

Figure 3 - Proposed Development Site Layout

[1] *28.8 MW is an indicative capacity. Actual installed capacity may be greater or less dependent on turbine model selection but will not be greater than 50 MW (i.e. will not breach the 50 MW threshold that would require the application to be determined under Section 36 of the Electricity Act 1989 (as amended)).*

Construction

8.4 The estimated construction period for the Proposed Development is approximately two years and includes a programme to reinstate all temporary working areas. It is anticipated that once ecological and weather constraints have been applied, that activity will largely be focussed on 17 months of the two year period. Given the remote location of the Proposed Development, it is proposed that construction hours will be 07:00 – 20:00, seven days a week. The construction period of the Proposed Development will occur outwith the breeding season for grey seals. i.e. unless otherwise agreed with OIC and NatureScot (formerly Scottish Natural Heritage, SNH), construction will not take place between the 15th of September and 31st of December inclusive, with sheet piling of the landing jetty completed by 15th August at the latest.

8.5 An indicative construction programme is shown below:

Activity	March	April	May	June	July	August		March	April	May	June	July	August
Site Establishment													
Emergency Access Works													
Slipway Fill Materials													
Slipway Concrete Material Imports													
Landing Jetty Sheet Piles													
Landing Jetty Fill Materials													
Landing Jetty Concrete Materials													
General Site Deliveries													
Access Track & Compound Material Imports													
Reinforcement													
Concrete Aggregate & Cement Deliveries													
Cable Deliveries													
Cabling Sand													
Geotextile / Duct Deliveries													
Substation Deliveries													

Activity	March	April	May	June	July	August		March	April	May	June	July	August
Cranage													
AIL Deliveries													
Commissioning													
Reinstatement Works													

8.6 The greatest traffic impact will be associated with the assembly of materials on the Mainland of Orkney, as Faray is an uninhabited island with no current vehicular traffic or metaled public road network. The Applicant will ensure that the vehicles will be routed as agreed with OIC, to minimise disruption and disturbance to local residents. (refer to Chapter 12 Traffic and Transport) of EIA Report for further details).

8.7 Prior to commencement of construction activities, the mitigation measures to be implemented will be provided within a Construction Environmental Management Plan (CEMP) to OIC (refer to Appendix 3.1 of EIA Report for further details).

Operation and Maintenance

8.8 It is predicted that during the operation of the site there would be up to two vehicle movements per week to Kirkwall Harbour (the likely start and end point for boat trips to and from Faray) for maintenance purposes.

8.9 Any diesel or oil stored on-site will be held within an appropriately bunded location within the on-site substation building.

8.10 In the unlikely event that a major turbine component requires replacement, vehicles delivering the components will use the new extended slipway and landing jetty, new access tracks and crane pads, utilising the same route as delivery of components during construction.

8.11 The Applicant will implement an Operation Environmental Management Plan (OEMP). Similar to the CEMP, the OEMP will set out how the Applicant will manage and monitor environmental effects throughout operation. The OEMP will be developed in consultation with NatureScot, the Scottish Environment Protection Agency (SEPA) and OIC.

Decommissioning

8.12 The Applicant is seeking in-perpetuity consent for the Proposed Development. However, should the Proposed Development be decommissioned it is expected that decommissioning would take approximately eight months. The environmental effects of decommissioning are considered to be no greater than construction effects but experienced over a much shorter time period.

8.13 The CEMP will be updated prior to decommissioning by the Principal Contractor to reflect current legislation and policy and will be agreed with OIC, NatureScot, SEPA and Historic Environment Scotland.

9 Consultation

9.1 Consultation remains a critical component of the EIA process. In order to inform the EIA, there has been on-going consultation with statutory consultees, engagement through the formal EIA Scoping process and subsequent discussions, correspondence and meetings as required. Full details of these are provided within each technical chapter of the EIA Report.

Public/Community Consultation

9.2 The Applicant has consulted widely with the general public/local community on the Proposed Development, including holding community consultation events and presentations at community council meetings. Full details of all the public consultation that has been undertaken can be found

within the Pre-Application Consultation Reports. Two separate reposts have been prepared, one supporting the planning application and a separate pre-application consultation report supporting the marine licence application.

10 Environmental Impact Assessment (EIA)

10.1 The EIA considers the likely significant effects of the Proposed Development during construction, operation and decommissioning on the following topics:

- landscape and visual amenity (the character of the landscape and views from agreed locations);
- ornithology (birds and protected bird habitats);
- terrestrial ecology (protected habitats and flora and fauna (excluding birds));
- noise (local properties);
- cultural heritage (direct and setting effects on archaeological features and heritage assets);
- hydrology, hydrogeology and geology (surface water, ground water, rocks and soils);
- traffic and transport (traffic and transport effects of the Proposed Development);
- socio-economics, tourism and recreation (effects to the local and national economy, local tourism businesses, recreation facilities, and the change in use of the land at the site of the Proposed Development);
- aviation and radar (civil and military aviation facilities and air space);
- underwater noise (effects caused by sheet piling of the landing jetty);
- marine water and sediment quality (effects caused by dredging of seabed sediment to allow for construction of the new extended slipway and landing jetty); and
- other issues (effects to telecommunications facilities, air quality, marine radar and navigation, coastal processes, benthic communities, commercial fisheries and calculation of carbon balance).

10.2 Chapter 4 (Approach to EIA) of the EIA Report describes the EIA process in more detail.

10.3 For each topic, the existing conditions (the baseline) were identified, the effects of the Proposed Development on these conditions assessed (the likely effects) and the standard best practice mitigation for those receptors identified. Likely effects are assessed to determine which are significant and on what scale. Mitigation measures have then been proposed to minimise or avoid adverse effects where required. Following this an assessment was undertaken of the effects of the Proposed Development on the existing conditions taking into consideration the proposed mitigations (the residual effects) to identify significant and non-significant effects. An assessment of the cumulative effects of Proposed Development in combination with other existing and proposed developments in the local area, primarily wind farms, was also undertaken.

10.4 A summary of the baseline conditions, the proposed mitigation and the resulting residual effects for each topic is provided below. Full details of the EIA for each of the topics are provided in Chapters 6 to 18 of the EIA Report.

Landscape and Visual

10.5 The assessment of landscape and visual effects has been carried out to identify the significant effects that are likely to arise as a result of the Proposed Development. It has considered the effects on landscape and visual receptors, as well as the cumulative effect of the Proposed Development in addition to other wind farm developments. The process involved identifying those receptors with potential to be significantly affected and assessing the potential impacts that the construction and operation of the Proposed Development will give rise to. The significance of the effects has been

assessed through combining the sensitivity of each receptor with a prediction of the magnitude of change that will occur as a result of the Proposed Development.

10.6 The study area for the Proposed Development covers a radius of 40 km and within this area, those receptors with the potential to be significantly affected have been assessed in detail. This has included one landscape element (i.e. the agricultural land the site is located within), 14 Landscape Character Units (LCU), nine Regional Coastal Character Areas (RCCAs) or Local Coastal Character Areas (LCCAs), 11 viewpoints and eight principal visual receptors. Photomontages have been prepared for all 11 viewpoints.

10.7 There are relatively few operational wind farms in the study area. The most notable is Spurness Point Wind Farm which comprises five turbines set on the southern tip of the island of Sanday. There are also medium and small-scale turbines on Eday, Rousay and Westray, with a small group of two turbines also on Westray.

10.8 In respect of the physical effects on landscape elements, the assessment found that the direct effect on the agricultural land as a result of the construction of the Proposed Development will be not significant. The losses will comprise only a small proportion of a much wider landscape resource, with improved pasture occurring in abundance across the Orkney Islands. Furthermore, improved pasture will be relatively easy to re-establish post-construction.

10.9 In respect of effects on landscape character, the assessment found there will be significant effects within a 6 km to 7 km radius of the Proposed Development, with significant effects occurring wholly in respect of five of the LCUs, and partly in respect of a further four LCUs. These LCUs are either close to the site or occur around the Westray Firth from where a strong association arises with the island of Faray, where the Proposed Development will be located. All LCUs beyond this radius will undergo no significant effects.

10.10 In terms of coastal character, the assessment found there will be significant effects within a 4 km to 5 km radius of the Proposed Development, with significant effects occurring wholly in respect of three of the RCCAs/LCCAs and partly in respect of a further two RCCAs/LCCAs. These RCCAs/LCCAs are either close to the site or occur around the Westray Firth from where a strong association arises with the island of Faray, where the Proposed Development will be located. All RCCAs/LCCAs beyond this radius will undergo no significant effects.

10.11 In respect of landscape designations, the assessment found that there will be no significant effects in respect of national and regional landscape designations within the study area.

10.12 In respect of effects on visual amenity, of the 11 viewpoints assessed, the assessment found that seven will be significantly affected during the construction and operational phases of the Proposed Development. These viewpoints are all located within an approximate 12 km radius of the Proposed Development. The viewpoints will mostly be affected owing to either their close proximity to the construction works and operation of the Proposed Development, or their greater sensitivity. All viewpoints beyond this 12 km range will not be significantly affected as a result of the Proposed Development, owing largely to their greater separation distance, as well as the wider natural and human influences which define their contextual character.

10.13 In terms of the Principal Visual Receptors (PVRs) assessed, the assessment found there will be significant effects within a 12 km radius of the Proposed Development, with significant effects occurring wholly in respect of four of the PVRs, and partly in respect of a further four PVRs. It was found that there would be significant effects on ferry passengers travelling between the Mainland of Orkney and the Northern Isles of Westray, Papa Westray and North Ronaldsay out to approximately 12 km south, 8 km north-west and 7 km north-east. There would also be significant effects on road-users of the B9066 on Westray over an approximate 2.5 km section from the south-coast out to 7 km and on road-users of the B9063 on Eday over an approximate 5.3 km section from the north-coast out to 4.5 km. In respect of Core Paths, there would be significant effects on the three close range paths on Eday, and the closest paths on Westray and Rousay. The remainder of these routes, and all other routes, will not be significantly affected during both the construction and operational phases. There will be no significant effects on settlements. There will, however, be

significant effects on local residents, with these effects being covered by the representative viewpoints.

Figure 4 - A photomontage showing the Proposed Development in operation from Westray Ferry

10.14 There will be no significant cumulative effects largely owing to the relatively small scale of the cumulative wind farms, both in terms of the number of turbines and their size, and / or their distance from the Proposed Development, which prevents wind farms becoming the prevailing characteristic of landscape character or visual amenity. This assessment applies to both consideration of the cumulative effects of the Proposed Development in conjunction and in combination with the other cumulative wind farms.

10.15 The Residential Visual Amenity Assessment (RVAA) in Appendix 6.2 of the EIA Report has considered the impact of the Proposed Development on the visual amenity of residents within a 2 km radius. There are five properties on the west coast of Eday which lie between 1.64 km and 2.01 km from the nearest proposed turbine. While all five of these properties will undergo a medium-high magnitude of change and a significant effect, none will reach the Residential Visual Amenity Threshold which would otherwise indicate that the effects could potentially be overbearing.

10.16 In summary, the Proposed Development will give rise to significant effects on landscape and coastal character during the construction and operation of the Proposed Development, albeit contained within the localised extent of approximately 6 km to 7 km. It will give rise to significant effects on visual amenity out to approximately 12 km during the construction and operation of the Proposed Development. While landscape and visual receptors beyond these ranges may be affected by the influence of the Proposed Development, these effects will not be significant. There will be no significant cumulative effects.

Ornithology

10.17 The full assessment of effects on ornithology (bird life) is provided in Chapter 7 (Ornithology) of the EIA Report.

10.18 Following consultation with NatureScot, a suite of ornithological surveys was adopted for the purposes of assessing the avian baseline conditions for the Proposed Development. The surveys included: vantage point surveys, breeding bird surveys, breeding seabird surveys and storm petrel surveys, all undertaken between April 2019 and August 2020.

10.19 Three species of high conservation value; raptor and owl, and two species of common raptor were registered during the full year of vantage point surveys. None were assessed as breeding within the site or within the 2 km survey area. Ten species of wildfowl and divers were recorded during the non-breeding season, while only two species were noted during the breeding season, namely red-throated diver and greylag goose (with only greylag goose confirmed as breeding). Three species of gull were recorded as breeding on the island with a further two species recorded during both the non-breeding seasons. Ten species of waders were recorded, six were recorded as breeding. Storm petrels were recorded as breeding within stone structures and boulder piles in both 2019 and 2020 predominantly located within a stone dyke running around the northern perimeter of the island. Small numbers of Arctic tern and a single great skua territory were recorded during surveys while black guillemot, fulmar and shag were abundant on the cliffs and boulders around the island fringes.

10.20 Although the levels of recorded flight activity are considered to be low or moderate, for the purposes of completeness, collision risk modelling was undertaken for greylag goose, red-throated diver, great skua, lapwing, oystercatcher, golden plover and curlew. Night-time flight activity surveys were undertaken for storm petrel but due to the low levels of flight activity at collision risk height no analysis was undertaken for this species.

10.21 An assessment of ornithology effects arising from the construction and operation of the Proposed Development was undertaken, based on the proposed layout and turbine dimensions. Through a standardised evaluation method, Important Ornithological Features were identified and brought forward for assessment. Important Ornithological Features taken forward for further consideration include one designated site (Mill Loch SSSI) and 13 species and species groups (greylag goose, red-throated diver, lapwing, oystercatcher, redshank, golden plover, ringed plover, curlew, great skua, Arctic tern, black guillemot, shag and gull species).

10.22 In line with guidelines, the impact assessment process assumes the application of standard mitigation measures. With these in place, predicted effects were considered to be barely perceptible and therefore not significant for all Important Ornithological Features. With further specific mitigation detailed, residual effects for construction and operation phases are considered to have barely perceptible adverse significance, i.e. not significant whereas proposed enhancement measures proposed for breeding storm petrels is predicted to have a long-term significant beneficial effect on the breeding population. In addition, not significant beneficial effects are associated with proposed grazing management measures.

10.23 Likely cumulative effects of nearby operational developments, as well as those currently consented or at application stage of planning, were also considered and no significant cumulative effects are anticipated as a result of the Proposed Development.

Terrestrial Ecology and Nature Conservation

10.24 The full assessment of effects on terrestrial ecology and nature conservation is provided in Chapter 8 (Terrestrial Ecology and Nature Conservation) of the EIA Report.

10.25 Following consultation with OIC, NatureScot and SEPA, a range of ecological studies were undertaken, to identify the terrestrial ecological interests of the Proposed Development and to establish the ecological baseline for the ecological impact assessment (EcIA). This included identification of existing wildlife records and nearby sites designated for nature conservation and survey of the habitats and faunal interests of the site. The following field surveys were undertaken:

- Habitats: extended Phase 1 habitat survey and National Vegetation Classification (NVC) assessment;
- Otter survey;
- Seal survey; and
- Bat survey.

10.26 The primary habitats identified on site above the shoreline (listed in order of size) are:

- Improved grassland;
- Semi-improved acid grassland; and
- Marshy grassland.

10.27 A range of small pools are present across the island, many of which are ephemeral. Several wet and dry ditches cross the island and a single and very short burn is present within the Study Area, outwith the development footprint. This flows directly west to the shore from two springs which rise in an area of marshy grassland to the west of the island centre.

10.28 The desk study identified the presence of five sites of international and nation importance designated for nature conservation, 15 designated seal haul-outs and two local nature conservation sites within 10 km of the site. The presence of grey seals and otter use of the island was also noted.

10.29 Through a standardised evaluation method devised by the Chartered Institute of Ecology and Environmental Management (CIEEM) (CIEEM, 2018), Important Ecological Features (IEFs) were identified and brought forward for assessment. IEFs taken forward to assessment include:

- Faray and Holm of Faray SAC and SSSI;
- Designated seal haul-outs;
- Standing water;
- Intertidal boulders/rocks;
- Groundwater-dependent terrestrial ecosystem (GWDTE) marshy grassland with springs;
- Otter; and
- Non-breeding grey seals.

10.30 Potential impacts of the construction and operation phases are presented, prior to an assessment of the effects of those impacts. In line with the CIEEM guidelines, the impact assessment process assumes the application of standard mitigation measures. Additional measures to control remaining impacts are also detailed, including development of Method Statements and Species Protection Plans. Of particular importance is a commitment to avoid construction works within the grey seal breeding season, the most sensitive period of the local seal population's lifecycle. With these in place, residual effects are assessed to be, at most, **negligible** adverse during construction for all described IEFs. During operation, there will be, at most, temporary **minor** adverse impacts to individual seals, if maintenance visits or major unplanned works (e.g. repairs) are required during the breeding season. Overall, both construction and operational effects are therefore considered not significant.

10.31 With a lack of connectivity to any other wind farms, or other types of developments, no cumulative effects are anticipated for the terrestrial (i.e. non-avian) interests of the site.

10.32 The assessment concludes that there will be no significant adverse effect on any of the terrestrial ecological interests of the site, resulting from the construction and operation of the Proposed Development.

Noise

10.33 The full assessment of noise effects is provided in Chapter 9 of the EIA Report.

10.34 This assessment considered the potential noise effects associated with construction and operation phases of the Proposed Development. No potential vibration effects were identified and therefore consideration of vibration was scoped out of the EIA Report. Potential noise effects to ecological receptors arising from marine construction and piling operations were considered separately in the underwater noise assessment (Chapter 16 of the EIA Report).

10.35 The assessment of noise comprised consultation with OIC Environmental Health Department, characterisation of the baseline noise environment, prediction of noise levels associated with construction activities, construction traffic, operation of wind turbines and operation of other non-turbine fixed plant, and evaluation of predicted levels against derived criteria, taking into account potential cumulative effects.

10.36 An initial noise modelling exercise was undertaken to identify properties which could potentially be subject to noise levels greater than relevant limits, depending on background noise and wind conditions. This identified Noise Sensitive Receptors (NSRs) on the western side of Eday, however for NSRs on Westray it was found that noise levels did not have potential to exceed relevant limits and these properties were therefore scoped out of further assessment.

10.37 Noise effects from construction, including on-site activities and construction traffic, were found to be not significant. Noise effects from fixed non-turbine plant (for example the site substation) have been evaluated and determined to be not significant. Likely significant effects associated with

operational wind turbine noise were identified at a small number of NSRs at 6 m/s and 7 m/s wind speeds associated with predicted noise levels marginally above derived noise limits.

10.38 The Applicant has committed to noise levels associated with operation of the Proposed Development meeting the development-specific noise limits to be agreed through the consenting process at all NSRs. Where necessary, and subject to final turbine selection, a noise management plan will be produced, identifying the curtailment[2] to be enacted at wind speeds and directions at which predicted operational noise levels exceed the consented noise limits. The requirement to implement the noise management plan will be subject to the findings of compliance monitoring. Residual noise effects due to operation are therefore not significant.

Cultural Heritage

10.39 The full assessment of effects on cultural heritage and archaeology is provided in Chapter 10 (Cultural Heritage) of the EIA Report.

10.40 The cultural heritage assessment identified the archaeological and cultural heritage value of the site and assessed the potential for direct and indirect effects on archaeological features and heritage assets resulting from the construction and operation of the Proposed Development.

10.41 This assessment has identified one designated asset within the site, namely the Quoy Chambered Cairn which is a Scheduled Monument. Additionally, 88 non-designated heritage assets were identified within the site. The Proposed Development has been designed to avoid directly impacting upon the Scheduled Quoy Chambered Cairn.

10.42 The Proposed Development has also been designed so as to avoid impacts upon known heritage assets where possible. Given the extent and density of recorded remains it has not been possible to avoid all impacts and there would be direct impacts on seven non-designated heritage assets. All of these assets are of post-medieval date and comprise the sites of former buildings and a well recorded from historic mapping, areas of former rig cultivation and a road and a slipway of 20th century date. Assets recorded and known only from historic mapping are judged to be of negligible importance. The remaining assets are judged to be of low importance. The Proposed Development would remove any deposits associated with the assets known from historic mapping evidence and the slipway. The Proposed Development would impact upon only part of the remaining assets leading to some loss of information content. A **minor** and not significant direct effect has been predicted in each case.

10.43 Planning policies and guidance require that account is taken of potential effects upon heritage assets by proposed developments and that where possible such effects are avoided. Where avoidance is not possible, effects on any significant remains should be minimised or offset. Given the potential for presently unknown archaeological remains, in particular of prehistoric and post-medieval date, to survive within the site, a programme of archaeological works designed to avoid inadvertent damage to known remains and to investigate and mitigate against the possibility of uncovering hitherto unknown remains will be undertaken.

10.44 The implementation of the above outlined mitigation measures will prevent inadvertent damage to known heritage assets; investigate the potential for previously unknown assets and disseminate the results of archaeological works to the public. Following the implementation of mitigation measures there may be a slight loss of overall information content and as such a marginal magnitude of residual impact is anticipated. The residual direct effect would be **negligible** and not significant.

10.45 Potential operational effects on the settings of designated heritage assets within the 5 km and 10 km study areas and selected assets within the 15 km study area have been considered in detail as part of this assessment. **Moderate** and significant effects have been predicted upon the setting of the Quoy Chambered Cairn, Muckle Hill of Linkataing Chambered Cairn, Vinquoy Hill Chambered Cairn and the Faray post-medieval landscape.

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[2] *If curtailment is necessary, this is likely to consist of turbines operating in a low noise mode, which would result in a slight reduction in energy output.*

10.46 A programme of Historic Building Recording will be undertaken within the site as compensatory mitigation to create a baseline record of the condition of the upstanding buildings on the site and partially offset potential impacts of the Proposed Development on the setting of the post-medieval landscape of Faray.

10.47 There would be **moderate** and significant residual effects on the setting of the Quoy Chambered Cairn, Muckle Hill of Linkataing Chambered Cairn, Vinquoy Hill Chambered Cairn and the Faray post-medieval landscape, although the core components and integrity of the setting of these assets would not be adversely affected.

10.48 The possibility of cumulative effects has been considered and assessed. A **minor** and not significant cumulative effect has been predicted on the setting of the Burn of Musetter standing stone and the chambered cairns at The Manse, Eday Church Hall, Calf of Eday Bay of London, Vinquoy Hill, Fitty Hill and Howa Tower. No additional cumulative effects have been predicted.

Geology, Hydrology and Hydrogeology

10.49 The full assessment of effects on geology, hydrology (surface water bodies, drainage and flooding) and hydrogeology (groundwater) is provided in Chapter 11 (Geology, Hydrology and Hydrogeology) of the EIA Report.

10.50 Ordnance Survey (OS) mapping shows two springs located in the centre of the site, from which a small stream flows towards the west into the sea. OS mapping also shows a number of caves and geos located along the coastline. There are no major surface watercourses within the study area.

10.51 OS mapping shows two springs located in the centre of the site at Grid References HY 52937, 36808 and HY 52937, 36762 from which a small stream flows towards the west into the sea. OS mapping also shows a number of caves and geos located along the coastline. There are no major surface watercourses within the study area.

10.52 There are six abandoned wells located within the site area, according to OS mapping. These are located in the central and northern parts of the island. The wells have been confirmed to be abandoned by OIC. There are no active Private Water Supplies (PWS) within the study area and there is no potential for hydrogeological continuity with any potential off-site areas where groundwater could be abstracted.

10.53 Site geology comprises sedimentary bedrock, overlain in the west southwest by superficial glacial till, along with localised blown sand and marine beach deposits (sand gravel and boulders). The remainder of the site is shown as having little or no superficial cover over bedrock. No peat has been identified at the site, from desk study and targeted peat survey work. Figure 5 below illustrates the grassland nature of the proposed turbine locations, with no vegetation/land cover suggestive of peat deposits.

10.54 Likely construction and operational effects include siltation or pollution of the water environment from surface runoff, and effects on groundwater quality and flow regime. Standard / embedded mitigation measures include appropriate design to minimise potential impact on minor surface watercourses, pre-construction site investigation works, and implementation of a CEMP and Drainage Strategy. These mitigation measures are considered to be robust and implementable and will result in no significant effects on the hydrological, hydrogeological and geological receptors.

10.55 The likely effects on hydrological, geological and hydrogeological receptors, taking account of the standard mitigation measures, have been assessed as **negligible** to **minor** (not significant).

10.56 No additional mitigation is proposed or considered necessary, beyond the standard / embedded mitigation noted above. The significance of residual effects on hydrological, geological and hydrogeological receptors is therefore considered to be **negligible** to **minor** (not significant).

10.57 No cumulative effects on hydrology, hydrogeology and geology are predicted.

Figure 5 - Approximate Turbine 1 Location

10.58 It should be noted that this chapter presents the assessment of effects on terrestrial geology, surface water and groundwater. Likely effects on the marine environment, relating to the proposed new extended slipway and landing jetty, have also been assessed and are discussed in Chapters 16, 17 and 18 of the EIA Report.

Traffic and Transport

10.59 The full assessment of effects on traffic and transport is provided in Chapter 12 (Traffic and Transport) of the EIA Report.

10.60 The Proposed Development will be accessed from new marine access points that will need to be constructed on the south-east of the island.

10.61 Materials for the majority of the works associated with the construction of the access track and crane hardstands will be won from on-site borrow pits. Material for the initial works will however need to be imported from quarries on the Mainland of Orkney.

10.62 Concrete will be batched on-site, with supplies coming from sources on Orkney. The majority of any traffic impact will therefore be focussed on the Mainland of Orkney.

10.63 The construction activities will lead to increased traffic volumes on the A965 during the construction phase only. Following commissioning of the Proposed Development, traffic flows will fall to two vehicle movements a week.

10.64 An assessment of likely effects using relevant guidelines has been undertaken. This determined that no significant effects would occur as a result of traffic flows associated with the Proposed Development.

Socio-economic, Recreation and Tourism

10.65 The full assessment of socio-economic effects, and effects on recreation and tourism is provided in Chapter 13 (Socio-economic, Recreation and Tourism) of the EIA Report.

10.66 The assessment considers the socio-economic, recreation and tourism impacts associated with the Proposed Development.

10.67 It was estimated that during the construction and development phase the Proposed Development could support £2.6 million GVA and 39 job years in Orkney, and £10.4 million GVA and 161 job years across Scotland (including in Orkney). The additional expenditure required to guarantee access to the island is expected to generate £0.2 million GVA and support five job years in Orkney and £0.8 million GVA and 11 job years across Scotland (including Orkney). Operation and maintenance spend

from the Proposed Development could have an annual impact of £0.3 million GVA and four jobs in Orkney and £0.5 million GVA and nine jobs in Scotland (including Orkney). In addition, it would contribute around £0.5 million to public finances through the payment of non-domestic rates.

10.68 The Proposed Development is also an essential part of the needs case required by Ofgem for the construction of an interconnector linking Orkney to the Scottish mainland. The transmission link would have substantial economic benefits, with potential GVA for the Orkney economy of between £371 million and £807 million, since it would enable the further development of the renewable energy sector in Orkney.

10.69 Communities living closest to the Proposed Development are expected to benefit from a location specific community benefit fund, of approximately £144,000 per annum. The impact from the payment of local community benefits was assessed as **minor** (beneficial) and not significant.

10.70 The ownership structure contributes to the distinctiveness of the Proposed Development, since profits would stay in Orkney and be used for the benefit of the people of Orkney, increasing the level of local benefits significantly and also socialising the benefits amongst as many people as possible. A key aim of the Proposed Development is to generate profit to be used for the benefit of the people of Orkney. Benefits will be delivered via a community fund with funding distributed in the interests of Orkney and its inhabitants. The effect associated with the ownership structure was assessed as **minor** (beneficial) and not significant in Orkney.

10.71 The assessment of the economic impacts found a temporary **minor** (beneficial) and not significant impact from the construction and development phase in Orkney and a temporary **negligible** (beneficial) and not significant impact in Scotland. The effect of the additional infrastructure required for access to the island was assessed as negligible (beneficial) with respects to both the Orkney and Scottish economies. Operation and maintenance spend from the Proposed Development was assessed as having a **negligible** (beneficial) and not significant impact on the local and national economy.

10.72 In addition, the indirect benefits associated with the contribution to the delivery of the interconnector and the additional indirect benefits associated with the ownership structure mean that the total direct and indirect economic benefits of the Proposed Development are expected to be much greater than would generally be expected for a development of this scale. Whilst it is noted that these benefits are indirect, the implications of the interconnector for the future development of renewable energy in Orkney would represent a material change for the Orkney economy, and so were assessed as **moderate** (beneficial) and significant.

10.73 The proposed Orkney's Community Wind Farm Project - Quanterness and Orkney's Community Wind Farm Project - Hoy may provide an opportunity for the local supply chain to strengthen and may result in larger local impacts, as businesses in Orkney would be able to carry out more works than might be the case for a single project.

10.74 Adding together the economic impacts from the development and construction of the Proposed Development and the construction of enabling infrastructure, the proposed Orkney's Community Wind Farm Project - Quanterness and the proposed Orkney's Community Wind Farm Project - Hoy, it was estimated that they could support a total £7.9 million GVA and 121 job years in Orkney, and £32.1 million GVA and 493 job years across Scotland (including in Orkney).

10.75 It was also estimated that the cumulative economic impact of the Proposed Development, the proposed Orkney's Community Wind Farm Project - Quanterness and the proposed Orkney's Community Wind Farm Project - Hoy during the operations and maintenance phase could be £0.9 million GVA and 12 jobs in Orkney and £1.6 million GVA and 26 jobs in Scotland (including in Orkney) each year. This cumulative effect was assessed as **minor** (beneficial).

10.76 The tourism assessment relied on a literature review of the relationship between wind farms and tourism activity in Scotland, as well as on a desk-based study of tourism and recreation assets and accommodation providers located in the proximity of the Proposed Development. The literature review found little evidence of a negative effect on the tourism economy.

10.77 Visitor attractions were identified within 15 km of the Proposed Development. The assessment has found that, for all identified attractions, as a result of separation distance and/or the fact that the Proposed Development would not impact upon visitor experience, it would not have an impact on motivation to visit them. As a result, the assessment has concluded that there would be a **negligible** and non-significant effect on visitor attractions.

10.78 The assessment of effects on popular routes has considered 19 recreational trails and 41 core paths within 15 km of the Proposed Development. Assessment of these routes found that the effect on their amenity as tourism or recreational assets would be **negligible** and not significant as the Proposed Development would not impact upon their use.

10.79 Analysis of representative accommodation providers within a 15 km study area considered whether visitor behaviour would change due to the Proposed Development and found that none would be made unattractive to guests, as a result of the Proposed Development. The assessment therefore found that effects would be **negligible**, and non-significant, both during construction and operation of the Proposed Development.

10.80 Overall, there were no significant adverse effects associated with the Proposed Development, while there would be some beneficial effects linked to construction and operational expenditure, though they would also not be significant. Whilst it is noted that the benefits are indirect and cannot be solely attributed to the Proposed Development, the contribution made to the threshold for the interconnector and the implications for the future development of the renewable energy in Orkney represent a material economic opportunity for Orkney, and is considered a **moderate** and significant beneficial effect.

10.81 The COVID-19 pandemic and the strategy being adopted for economic recovery and transformation, based on green growth, means that the Proposed Development can be considered to be of substantial socio-economic importance, since it has the potential to make a meaningful contribution to economic recovery, providing employment during the construction phase and boosting productivity growth in the economy during the operational phase.

Aviation and Radar

10.82 The full assessment of effects on aviation and radar is provided in Chapter 14 (Aviation and Radar) of the EIA Report.

10.83 The assessment of aviation and radar involves considering all military and civil aerodromes in the wider area out to circa 30 km, all radar installations out to the limit of their range, all navigational aids, air-ground-air communications stations and low flying activities.

10.84 Consultations were conducted with NATS, Highlands and Islands Airports Ltd (HIAL), OIC Airfields, Kirkwall Airport and the Ministry of Defence (MoD).

10.85 No objections were received from NATS, HIAL and OIC Airfields.

10.86 The Kirkwall Senior Pilot for Loganair did not object but requested daytime only red aviation lighting, as mitigation for low flying under conditions of reduced visibility.

10.87 Aviation obstruction lighting will be fitted, the final specification to be agreed with the CAA and Loganair. The EIA has been based on the assumption of steady red medium intensity light with the intensity being able to be reduced to 10 % in conditions of good visibility. Recommended lighting also reduces in intensity below the horizontal to minimise the downward spillage of light.

10.88 The MOD did not object but noted that the Proposed Development may have an impact on low flying operations. MOD scoping responses are based on generic mapping with no project specific assessment having been conducted. The assessment conducted in the impact assessment has determined that at full application there will be no low flying objection.

10.89 In addition, the MOD considered it probable that it would request MOD accredited visible or infrared aviation safety lighting to operate from dusk till dawn. This requirement will be met with infrared lights fitted to every turbine nacelle. This lighting will not be visible to the human eye.

10.90 Following implementation of the required mitigation outlined above, it is concluded that there will be no significant residual effects on aviation or radar as a result of the Proposed Development.

Shadow Flicker

10.91 The full assessment of shadow flicker effects is provided in Chapter 15 (Shadow Flicker) of the EIA Report.

10.92 Shadow flicker is the effect of the sun passing behind the moving rotors of turbines casting a flickering shadow through the windows and doors of neighbouring properties. This occurs in certain combinations of geographical position, time of day, time of year and specific weather conditions. No impact can occur from this during the construction of the Proposed Development.

10.93 The study area within which properties could potentially be affected by shadow flicker covers a distance of 10 rotor diameters plus an additional 50 m from each turbine and lies 130 degrees either side of north (relative to each turbine). In the case of the Proposed Development, this area extends to 1,410 m from each turbine. At OIC's request, for additional conservatism, the study area has been extended beyond this to include properties within 2 km of the turbines.

10.94 No shadow flicker impact can occur during the construction of the turbines.

10.95 Shadow flicker modelling was undertaken for five receptors. Both the worst-case and realistic modelling identified no effects at four of the receptors. No significant effects were identified at the fifth receptor as the shadow flicker anticipated in a realistic scenario would equal one hour and 22 minutes per year, which is significantly below the eight hours per year threshold considered to be a significant effect.

10.96 Furthermore, it is important to note that these results do not take into account any existing features which would limit the incidences of shadow flicker such as screening features (structures and vegetation), dwelling orientation, blinds or curtains which will reduce potential effects further. Receptors may also be in rooms that are not generally used at the affected times, therefore, the amount of time when shadow flicker is actually 'experienced' will likely be significantly less than what has been predicted.

10.97 No mitigation is considered to be required.

10.98 No significant residual effects are anticipated from shadow flicker at all receptors during all phases of the Proposed Development.

Underwater Noise

10.99 The full assessment of effects of underwater noise is provided in Chapter 16 (Underwater Noise) of the EIA Report.

10.100 The Proposed Development construction phase would likely involve sheet piling of the new landing jetty below MHWS. Piling causes high-amplitude, impulsive sounds that can result in a range of impacts to marine mammals, from behavioural changes to masking auditory cues used for navigation, communication and foraging and injury, such as physical damage to hearing systems. Thus, an assessment of underwater noise impacts, via piling, to marine mammals was undertaken.

10.101 The following marine mammals were scoped into the underwater noise assessment:

- Pinnipeds (grey seal and harbour seal);
- Low-frequency cetaceans (baleen whales);
- Mid-frequency cetaceans (common dolphin, bottlenose dolphin, Atlantic white-sided dolphin, orca, long-finned pilot whale, minke whale, Risso's dolphin, white-beaked dolphin); and
- High-frequency cetaceans (harbour porpoise).

10.102 Three impact thresholds were assessed, with the modelling identifying the area where these thresholds would be exceeded:

- Potential for permanent impacts, known as Permanent Threshold Shift (PTS). PTS is where permanent impacts to hearing sensitivity could occur (note this is any permanent change to hearing sensitivity, not just total loss of hearing).
- Potential for temporary impacts, known as Temporary Threshold Shift (TTS). TTS is where temporary injury would occur, i.e. temporary impacts to hearing sensitivity which will return to normal overtime.
- Potential for behavioural changes. At sound levels lower than those that can cause injury, impacts may also occur due to behavioural disturbance to marine mammals. Possible behavioural changes may include startle response, extended cessation or modification of vocal behaviour, brief cessation of reproductive behaviour or brief separation of females and dependent offspring.

10.103 The assessment draws upon detailed numerical modelling of underwater sound propagation and includes the presence of standard mitigation measures. The following standard mitigation was included within the assessment:

- The Joint Nature Conservation Committee (JNCC) piling protocol will be implemented to manage potential impacts to marine mammals. Specifically, the model assumed a soft-start procedure would be implemented. This is where the piling power is gradually ramped up over a period of at least 20 minutes to allow for marine mammals to vacate the area.
- Piling will not take place any later in the year than 15 August. This will ensure piling is out with the breeding season and the month prior where seals may be returning to the island for breeding purposes.

10.104 The JNCC piling protocol also requires that a pre-piling search of an established 500 m mitigation zone around the piling operations is undertaken for a period of at least 30 minutes to ensure the area is clear of marine mammals prior to the soft-start commencing. This mitigation cannot be built into the model as the purpose is to identify the area within which impacts may occur.

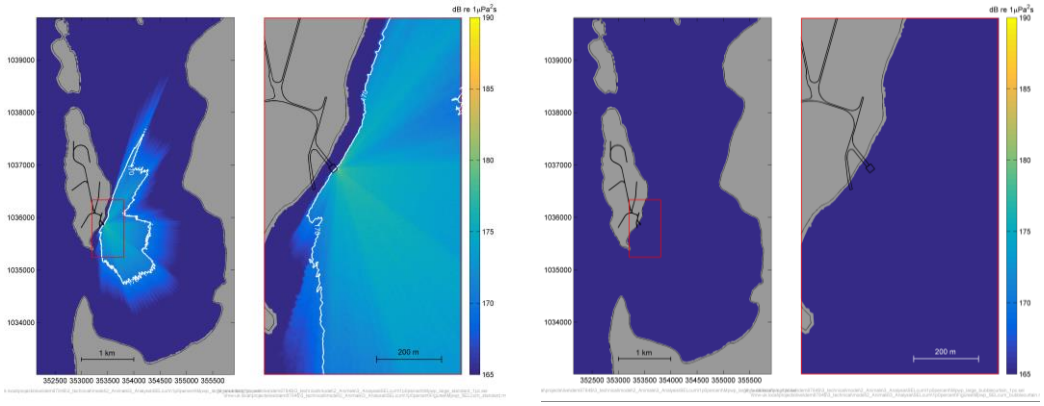
10.105 The modelling assesses various methods under which marine mammals would escape the area of noise – swimming directly away from the source or leaving the bay via the nearest route.

10.106 The modelling shows that, with the use of standard mitigation (i.e. soft-start), mid-frequency cetaceans are predicted to receive dosages that are below the threshold for both the TTS and PTS. Thus, effects to mid-frequency cetaceans were assessed as **negligible and not significant**. The modelling, did, however, identify the potential for exceeding TTS and PTS thresholds for seals, baleen whales and harbour porpoise. As such the use of additional mitigation, in the form of a bubble curtain, was investigated. Modelling outputs for seals, baleen whales and harbour porpoise are provided in Figure 6, Figure 7 and Figure 8.

10.107 The use of the bubble curtain significantly reduces the area over which impact thresholds are exceeded. The implementation of standard mitigation plus a bubble curtain results in no exceedance of the PTS threshold for any marine mammal species. The predicted distances for TTS for seals is also reduced to zero (Figure 6). As such the residual effect to grey seals is **negligible and not significant**.

10.108 The area of TTS exceedance predicted for baleen whales is significantly reduced and restricted to within the bay (Figure 7). Given the shallow waters within the bay, the likelihood of baleen whales being present within the area is low. Thus, residual effect to baleen whales when using standard mitigation and the bubble curtain is deemed to be **minor and not significant**.

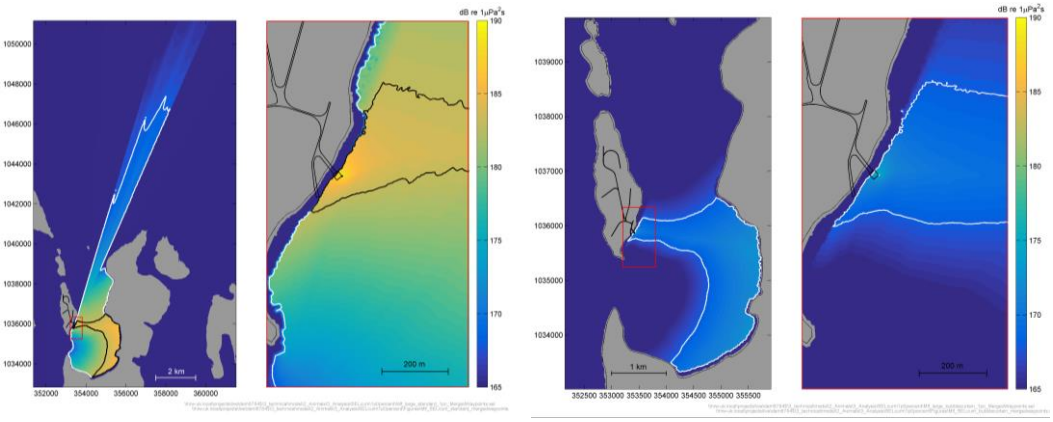
10.109 With the use of standard mitigation plus a bubble curtain, the area of TTS exceedance for harbour porpoise is limited to within the standard 500 m mitigation zone within which a pre-piling search would be undertaken (Figure 8). Thus, the likelihood of harbour porpoise being within the area of TTS exceedance is very low. As such, the residual effect to harbour porpoise is also deemed to be **minor and not significant.**



Standard mitigation (soft-start) only: White contour indicates the area where the thresholds for temporary impacts (TTS) to seals is exceeded. No exceedance above permanent impact (PTS) thresholds. This assumes seals swim directly away from noise source.

Standard mitigation (soft-start) + additional mitigation (bubble curtain): No exceedance of thresholds for temporary (TTS) or permanent (PTS) impacts to seals. This assumes seals swim directly away from noise source.

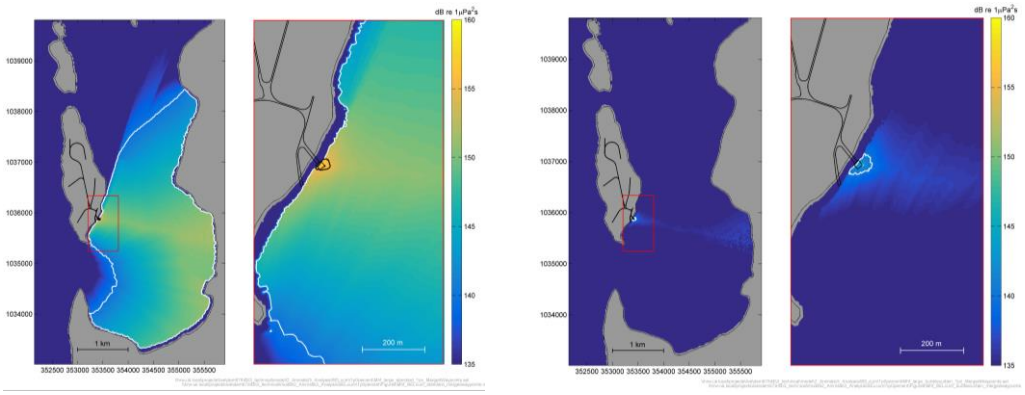
Figure 6 - Pinniped (seal) Underwater Noise Modelling Outputs



Standard mitigation (soft-start) only: Black and white contours indicate the areas where the thresholds for permanent (PTS) and temporary (TTS) impacts to baleen whales are exceeded. This assumes baleen whales leave the bay area via the nearest exit.

Standard mitigation (soft-start) + additional mitigation (bubble curtain): No exceedance of permanent impact (PTS) threshold (black contour) whilst temporary impact (TTS) threshold is significantly reduced (white contour). This assumes baleen whales leave the bay area via the nearest exit.

Figure 7 - Low-frequency Cetaceans (Baleen Whales) Underwater Noise Modelling Outputs



Standard mitigation (soft-start) only: Black and white contours indicate the areas where the thresholds for permanent (PTS) and temporary (TTS) impacts to harbour porpoise are exceeded. This assumes harbour porpoise leave the bay area via the nearest exit

Standard mitigation (soft-start) + additional mitigation (bubble curtain): No exceedance of permanent impact (PTS) threshold (black contour) whilst temporary impact (TTS) is significantly reduced and is within the mitigation zone (white contour). This assumes harbour porpoise leave the bay area via the nearest exit.

Figure 8 - High-frequency Cetaceans (Harbour Porpoise) Underwater Noise Modelling Outputs

10.110 Behavioural disturbance of the marine mammals is predicted to occur over a larger area compared to the areas of potential injury described above. Although the areas are quite large, behavioural impacts are temporary and reversible and the percentage of marine mammals impacted at regional and population levels is low; <1% of all species when the bubble curtain is applied. As such the residual effects from behavioural disturbance are deemed to be **negligible and not significant** for all marine mammal species assessed.

Marine Water and Sediment Quality

10.111 The full assessment of effects of dredging on marine water and sediment quality is provided in Chapter 17 (Marine Water and Sediment Quality) of the EIA Report.

10.112 The installation of the new extended slipway and landing jetty will require dredging below MHWS. As shown in Figure 9, the slipway will require dredging of an area of up to 600 m^2 to the south of the slipway, whilst the landing jetty will require dredging of an area up to 2,400 m^2 at the seaward end of the docking structure. Dredging will be to a maximum depth of 1m which will require disposal at sea. It is anticipated that the dredged material will be disposed of at a licenced disposal site close to the Proposed Development. The likely disposal site will be Stromness A. This assessment of potential impacts on marine water and sediment quality does not include assessment of disposal on the basis that the disposal is at a site that is already an accepted and regulated activity. However, a Best Practical Environmental Options (BPEO) has been prepared to accompany the dredging marine licence application. This includes an assessment of alternative options, outlining why disposal at sea was determined as the BPEO in this instance. In addition, as requested by the Northern Lighthouse Board (NLB), disposal plans will be included within the Port Management Plan. Dredging is expected to be completed in 1-2 weeks.

10.113 A survey to collect sediment samples, which was subsequently subjected to Particle Size Analysis (PSA) and contaminants at an accredited laboratory, show that the material to be dredged is almost entirely sand with a very low content of fine material.

10.114 Sand particles released into the water column during the dredging activity will re-deposit onto the bed within a few hundred metres of the dredging. The desk study estimates the distribution of this re-depositing sediment by considering the rate at which these sand particles will fall back onto the bed and the distance moved by the sand particle (under the influence of tidal currents) over that

period. The release of sand particles is estimated to be 5% of the material that would be dredged (though this figure will reduce depending on the prevalence of sandstone boulders). This means that around 150 m^3 of sand will be deposited, a portion of which will redeposit in the dredging areas and be re-dredged.

10.115 The estimated depths of sand deposition are in the region of:

- 8-14 mm within 50 m of the slipway and causeway,
- 2-8 mm within 50-150 m of the slipway and causeway; and,
- falling to below 1 mm at a distance of 200 m.

10.116 The levels of sediment deposition as a result of the dredging activity is likely to result in a temporary **minor and not significant** effect within 150 m of the dredging activity and will reduce to **negligible and not significant** at distances further than that.

10.117 The chemical analysis of the sediment samples collected as part of the planning process, show that sediment in the areas to be dredged contains very low concentrations (or below levels of detection) of heavy metal, organotin, polyaromatic hydrocarbons, polychlorinated biphenyls and pesticides. Where chemicals were found in very low concentrations, all were well below the all available action levels, such as Marine Scotland action levels and the Canadian temporary effect level, in most cases by an order of magnitude lower.

10.118 On this basis there is considered to be **no effect** on water quality chemical parameters as a result of the dredging activity and a **negligible and not significant effect** during the limited time period required for the dredging for suspended sediments.

Other Issues

10.119 The full assessment of other issues provided in Chapter 18 (Other Issues) of the EIA Report.

Telecommunication

10.120 A review of telecommunications links showed that there are no telecommunication links within the site boundary or within close proximity to the site boundary. Given the location and relative heights of the nearest television transmitters, as well as the fact they have switched to digital transmission only, there will be no impacts on the television signal.

Air Quality

10.121 The Proposed Development has been deemed not to reach the criteria required for air quality assessments for traffic or dust, as no significant effects are anticipated.

Carbon Savings

10.122 Although the Proposed Development will generate carbon free electricity, carbon will be released during the manufacturing, delivery and construction of the Proposed Development. However, this generation of carbon is minimal in comparison to the generation of carbon free electricity, and it is estimated that carbon generation will be offset by the Proposed Development's carbon savings within approximately three months. The site would in effect be in a net gain situation following the estimated three month carbon payback period and will be contributing to national objectives of reducing greenhouse gas emissions. Additionally, the Proposed Development would make a material contribution to creating the demand for the proposed new subsea interconnector to Orkney, which in turn would help deliver sustainable development and the drive to net zer

Coastal Processes

10.123 The installation of the new extended slipway and landing jetty has the potential to interrupt the natural coastal processes within the area, such as tidal flows, local currents and sediment movement.

10.124 The coast within the Proposed Development is characterised as intertidal boulder/rocks, and therefore is less likely to experience coastal process impacts. North Orkney is highly efficient in dissipating wave energy and provides a high degree of protection to the coastal edge from erosion during storm conditions. This is evidenced by little coastal erosion being recorded at the site over at least the last 130 years. The area is also sheltered, which is evident by the presence of seagrass recorded during the site seabed survey.

10.125 Given the relatively small size of the proposed structures, the rocky and sheltered nature of the site, lack of historic erosion recorded and the fact that the slipway was historically longer, effects to coastal processes are considered to be **negligible and not significant.**

10.126 The coastal processes assessment was based on the worst case footprint of the new extended slipway and landing jetty, assuming the largest vessels the proposed marine infrastructure can support. Suitable vessels will be determined by the turbine manufacturer. Where possible, efforts will be made to identify vessels, such as barges, that would not require anchoring or dredging, in order to limit the size of the infrastructure and channel dredging requirements. This, in turn, would reduce impacts to coastal processes.

Benthos

10.127 Construction of the new extended slipway and landing jetty will result in seabed disturbance as outlined in Table 1. A total of approximately 3,218 m^2 would be disturbed, of which 1,168 m^2 would be permanent impacts from the proposed structures, whilst the remaining 2,050 m^2 would be via dredging, therefore the area is expected to recover over time.

Table 1 - Seabed disturbance

Structure	Structure footprint	Dredging area
New extended slipway	Maximum 36 m long and 8 m wide. The existing slipway is 20 m by 3.5 m, resulting in an additional 218 m^2 of seabed disturbance	Up to 600 m^3 of sediment would be dredged at the end of slipway to a maximum of 1 m depth Resulting in up to 600 m^2 of seabed disturbance
Landing jetty	Causeway measuring a maximum of 55 m long by 10 m wide, terminating in a square docking structure measuring a maximum 20 m by 20 m. Resulting in up to 950 m^2 of seabed disturbance	Approximately 2,400m^3 of sediment would be dredged to a maximum of 1m depth, equating to up to 2,400m^2 of seabed. This includes dredging within the footprint of the landing jetty. Thus, dredging would result in up to an additional 1,450m^2 of seabed disturbance
Total	Up to 1,168 m^2	Up to 2,050 m^2

10.128 Consultation with NatureScot indicated that seabed survey footage should be obtained to identify biotopes and the potential for Priority Marine Features (PMF) within. The majority of the seabed was classified as sand, with areas of boulders and rock. A bed of seagrass, likely *Zostera marina*, was identified towards the end of both structures. A band of kelps (*Laminaria saccharina* and *Laminaria hyperborea*) with intermittent sandy patches was identified nearer to shore. Both seagrass and kelp are PMFs.

10.129 As PMFs, seagrass and kelp are a nationally important species and both features identified by Marine Scotland's Feature Activity Sensitivity Tool (FeAST) tool as having a relatively high sensitivity to seabed disturbance. However, the works are not within a site designated for either seabed habitats. In addition, there are numerous recordings of both PMFs within the Orkney region, as shown on Marine Scotland's National Marine Plan interactive (NMPi) map. Furthermore, based on site survey video footage, both habitats are likely to be relatively abundant along the east coast of Faray.

10.130 In terms of seagrass impacts, the majority of the disturbance would be outside the area of the seagrass bed (see Figure 9). Based on the available seabed survey video footage and the planned location of the structures, both structures are out with the band of seagrass, thus impacts to seagrass would likely be limited to dredging. It is estimated that an area of approximately 300m^2 of seagrass would be dredged for the landing jetty. FeAST defines seagrass recoverability as very low, however, given the very small area of estimated impact in comparison to available seagrass PMF habitats in the region effects are considered to be minor and not significant.

10.131 In terms of kelps impact, based on the available survey video footage and planned locations of the structures it is estimated that an area of approximately 300m^2 of kelps, rock, boulders, fucoids, and greens and filamentous reds would be impacted by the slipway (see Figure 9). The majority of this would be from dredging, with approximately 100m^2 estimated to be within the permanent footprint of the slipway. A further approximately 1,200m^2 would be within the jetty footprint, of this, approximately 550m^2 would be associated with the permanent footprint of the jetty causeway, with the remainder of the area dredged. Note, this area is not exclusively kelps. Feast defines kelp recoverability is medium to high. Thus, given the very small area of estimated impact in comparison to available kelp PMF habitats in the region, effects are considered to be minor and not significant.

10.132 Overall, given the relatively small area of seabed disturbance, effects to benthic species, including PMFs, are considered to be **minor and not significant**.

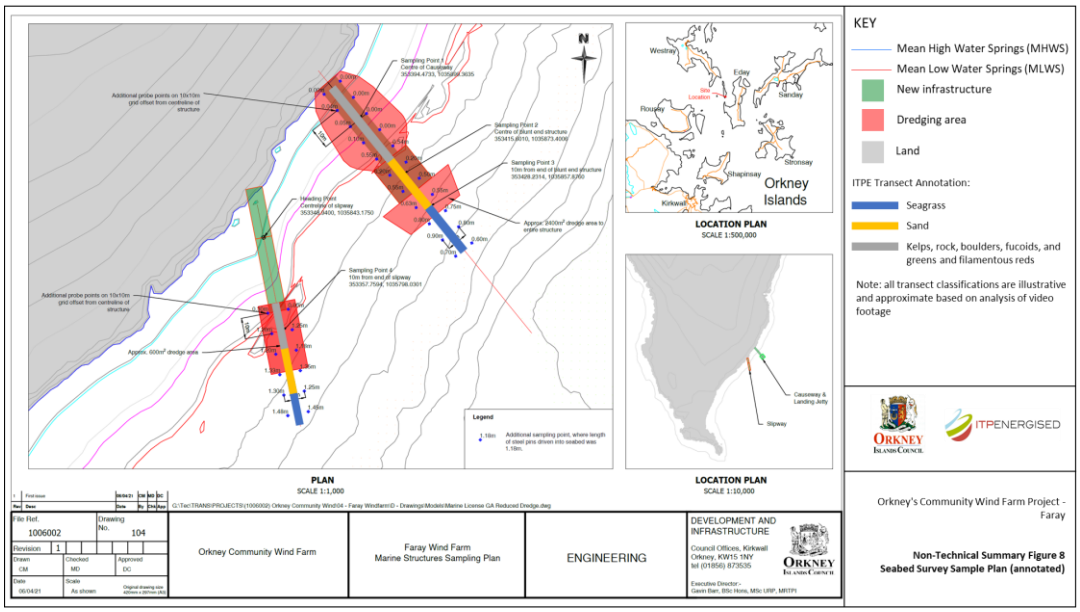


Figure 9 - Seabed Survey Sample Plan (annotated)

10.133 The benthic impact assessment was based on the worst case footprint of the new extended slipway and landing jetty and associated dredging, assuming the largest vessels the proposed marine infrastructure can support. Suitable vessels will be determined by the turbine manufacturer. Where possible, efforts will be made to identify vessels, such as barges, that would not require anchoring or dredging, in order to limit the size of the structures and channel dredging requirements. This, in turn, would reduce impacts to benthic communities, including the identified seagrass and kelp PMFs.

Marine Navigation and Radar

10.134 The installation of the new extended slipway and landing jetty, along with vessel journeys to the island, has the potential to impact marine navigation and radar within the area. OIC's Marine Services and Harbour Authority department and Orkney Ferries Ltd, along with the NLB have been consulted with respect to any marine and shipping radar installations and the potential for the Proposed Development to create conflicts with any such installations. Consultation with them has identified no objections or potential for significant effects caused by the Proposed Development on marine radar.

10.135 The Proposed structures would be within very close proximity to Faray, a maximum of 110 m below MHWS, which would not interact with the existing Kirkwall – Papa Westray and Hollandstoun (North Ronaldsay) – Kirkwall routes which travel through the bay. The construction works, including localised dredging, will be temporary in nature and contained within the bay. As such, the effects to navigation associated with the installation and operation of the extended slipway and landing jetty are considered to be **negligible and not significant.**

10.136 A Port Management Plan will be prepared to manage abnormal load deliveries and other marine traffic at Hatston Pier to ensure that there will be no interruption to existing operations. The Port Management Plan will include disposal plans and the appropriate Marine Safety Information and Notice to Mariners will be published prior to, and during, the works. In addition, following completion of the construction works, the UK Hydrographic Office will be notified of the as-built layout of the new slipway and jetty, along with the revised depths as a result of dredging.

Commercial Fisheries

10.137 The installation of the new extended slipway and landing jetty has the potential to displace commercial fishing activity within the area.

10.138 Fish landings data from Marine Scotland has been analysed for the area, which shows that landings contributions from the area are relatively small in comparison to Orkney's total landings value. In addition, the works will be temporary and localised. Thus, effects to commercial fishing from the proposed marine infrastructure are considered to be **negligible and not significant.**

10.139 Consultation with the local fleet, via Orkney Fisheries, will continue as the design develops to ensure fishermen are aware of any works being undertaken and any potential temporary displacement as a result of the works.

11 Conclusion

11.1 This Non-Technical Summary of the EIA Report provides an overview of the EIA undertaken for the Proposed Development in Faray, in the Orkney Islands.

11.2 Within Chapter 19 (Schedule of Environmental Commitments) of the EIA Report a schedule of commitments can be found which details the environmental mitigation measures which the Applicant has committed to implement, while Chapter 20 (Summary of Residual Effects) of the EIA Report summarises the likely environmental effects, the mitigation to be implemented and the resulting residual effects.