Orkney's Community Wind Farm Project - Hoy

Non-Technical Summary

September 2020

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Contents

Abbreviations

AOTs	Apparently Occupied Territories
BNG	British National Grid
CEMP	Construction Environmental Management Plan
CTMP	Construction Traffic Management Plan
EIA	Environmental Impact Assessment
GHG	Green House Gasses
GWDTEs	Groundwater Dependent Terrestrial Ecosystems
GVA	Gross Value Added
ha	Hectare
HIAL	Highlands and Islands Airports Ltd
HGV	Heavy Goods Vehicle
LCU	Landscape Character Unit
LNCS	Local Nature Conservation Site
MOD	Ministry of Defence
MW	Megawatt
NTS	Non-Technical Summary
NSA	Natural Scenic Area
OEMP	Operations Environmental Management Plan
Ofgem	Office of Gas and Electricity Markets
OIC	Orkney Islands Council
RCCA	Regional Coastal Character Area
SEPA	Scottish Environmental Protection Agency
SHE-T	Scottish Hydro Electric Transmission
SNH	Scottish Natural Heritage
SLQ	Special Landscape Qualities
WLA	Wild Land Area
WLQs	Wild Land Qualities
ZTV	Zone of Theoretical Visibility

1 Background

1.1 This document is a Non-Technical Summary of Orkney's Community Wind Project - Hoy 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 Hoy, Orkney.

Background and Needs Case Considerations

1.2 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.

1.3 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. The lack of grid capacity has driven some innovation locally, but the overall impact has been to heavily impede development of the energy industry.

1.4 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. 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.

1.5 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.

1.6 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.

1.7 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

1.8 In response to the Orkney Islands Council (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 requesting 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.

1.9 The outcome of this process was the decision to focus on development of a project of up to 108 MW on Hoy.

1.10 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.

1.11 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.

1.12 The land on Hoy 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 Environmental Impact Assessment (EIA) of the Proposed Development in accordance with The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (‘the EIA Regulations'). 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 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. An assessment of residual effects, those expected to remain following implementation of mitigation measures, is also presented.

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, 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 £1,250.00 (including printing and distribution).

4 Representations to the Application

4.1 Any representations to the application should be made directly to OIC Development Management at: planning@orkney.gov.uk

5 Site Location and Description

5.1 The main body of the site lies approximately 1.3 km west of Lyness on the island of Hoy. The site extends to approximately 488 hectares (ha) and is centred on British National Grid (BNG) ND 27973 93844 (Figure 1).

5.2 The site lies within a sloping landscape with a ridge running its full northern extent at an elevation of approximately 180 m AOD. The site drops to elevations of approximately 10 m AOD at the eastern extents of the Burn of Ore and the access track. The land to the south of the site rises back up to c.150 m AOD at Binga Fea.

5.3 The Burn of Ore flows from west to east across the southern extent of the site, with three small tributaries joining from the north.

5.4 There are no residential properties within the site boundary. The closest dwelling is Thurvoe c.950 m east of the nearest proposed turbine.

5.5 The land is used for low quality rough grazing. There is also evidence of peat cutting in the north-central site area.

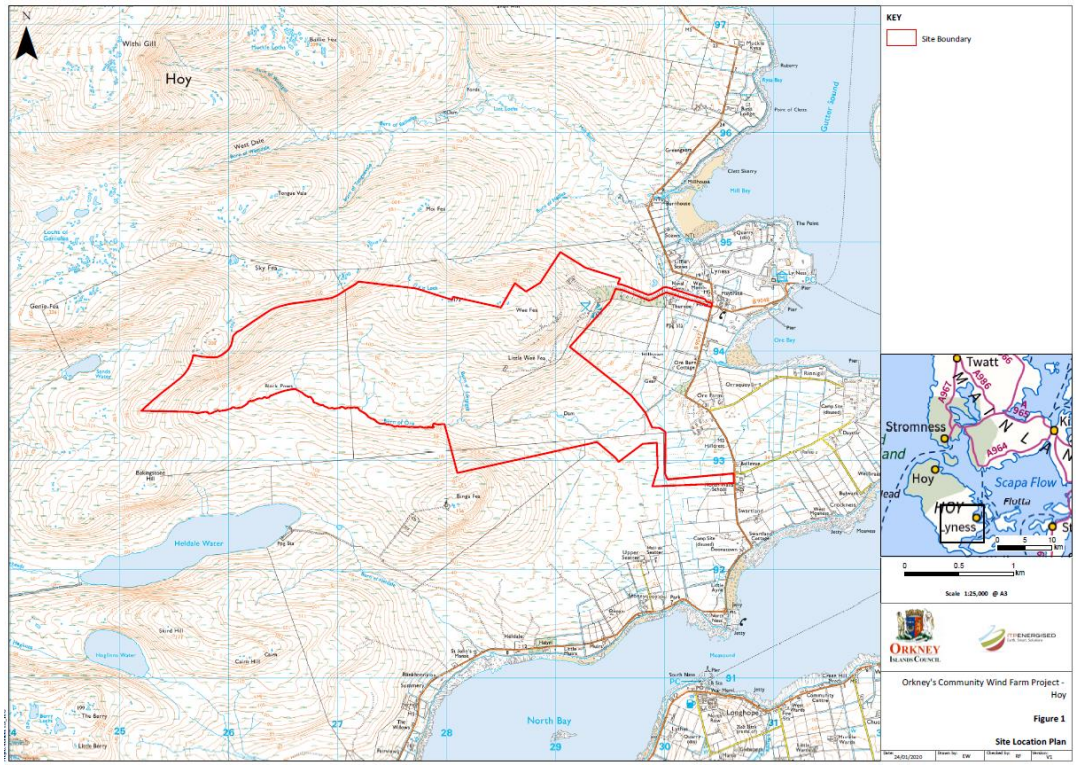

Figure 1. Site Location

6 Design Process

6.1 The design of the Proposed Development has undergone several iterations of turbine and access track 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 designated and protected sites;
- positioning turbines to minimise impacts on ornithology;
- utilising existing tracks, where possible, in order to reduce the footprint of the Proposed Development;
- maximising the distance as far as possible from potential Groundwater Dependent Terrestrial Ecosystems (GWDTEs);
- avoiding positioning turbines in Wild Land Areas (WLA) as far as possible;
- avoiding inconsistent turbine spacing, such as relatively large gaps, outliers or excessive overlapping turbines to minimise visual confusion and ensure a balance / compact array from key views within the National Scenic Area (NSA), WLA and the wider area;
- positioning turbines outwith agreed telecommunication link buffers;
- maintaining a suitable separation distance from residential properties to minimise noise, flicker and visual amenity impacts;
- minimising impacts on cultural heritage assets;
- minimising the impacts from traffic and transport;
- maintaining a 50 m buffer from watercourses and keep watercourse crossings to a minimum (one water crossing only);
- avoiding areas of high flood risk; and
- avoiding areas of deepest peat and areas of elevated peat slide risk where possible.

6.2 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.

7 Description of the Development

The Proposed Development

7.1 The Proposed Development comprises of six wind turbines of up to a maximum 149.9 m height from ground to blade tip when vertical. The indicative capacity of the Proposed Development is 28.8 MW. The actual installed capacity may be greater or less dependent on turbine model selection but will not be greater than 50 MW.

7.2 The proposed locations of the six turbines, together with their access tracks, and temporary construction compounds are shown on Figure 2**.** 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. Should micro-siting be required, the turbine locations will not be moved within the accepted telecommunications buffer (75 m clearance from the blade tip) unless otherwise agreed with BT. In addition, the overall separation distance to the closest residential property (Thurvoe) will not be reduced. It is proposed that the micro-siting of all infrastructure will be subject to an appropriately worded planning condition.

7.3 A number of ancillary elements are also proposed, including access tracks, a watercourse crossing, crane hardstandings, underground cabling, possible external transformers, on-site substation and maintenance building, a temporary construction compound, a borrow pit and a permanent

meteorological mast. A full description of the Proposed Development can be found in Chapter 3 (Proposed Development) of the EIA Report.

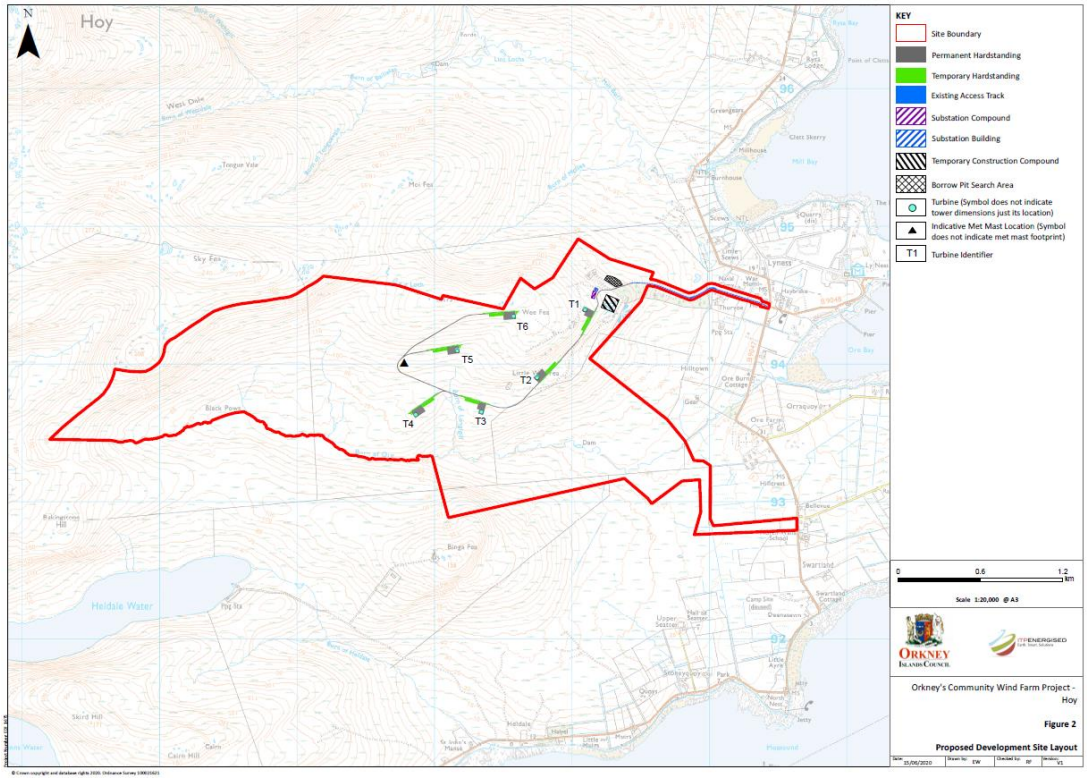

Figure 2 – Proposed Development Site Layout

Construction

7.4 The estimated on-site construction period for the Proposed Development is expected to take approximately 18 months and includes a programme to reinstate all temporary working areas. Normal construction hours will be between 07:30 to 18:00 weekdays and 08:00 to 13:00 Saturdays. There will be no working on Sundays or bank holidays. If required, additional working hours will be agreed in consultation with OIC's Environmental Health Officer. These times have been chosen to minimise disturbance to local residents and if required to be restricted this will be agreed with OIC by an appropriately worded condition.

7.5 The construction programme will consist of the following principal operations. The Proposed Development will be phased so that certain activities will take place concurrently:

- construction of the construction compound, including preparatory earthworks, and establishment of a storage area for wind farm components and temporary site facilities;
- construction of access tracks, including preparatory earthworks, opening of the borrow pit, construction of drainage, and excavation of cable trenches;
- construction (including preparatory earthworks) of wind turbine foundations, crane pad hardstanding areas, met mast and substation;
- cable laying;
- erection of wind turbines;
- connection of on-site electrical power and signal cables;

- commissioning of the site equipment; and
- site reinstatement and restoration of temporary works areas.

7.6 The Applicant will ensure that all construction traffic will be routed as agreed with OIC to minimise disruption and disturbance to local residents (refer to Chapter 12 of EIA Report for further details).

7.7 To avoid impacts on the scheduled ferries, no abnormal loads will be moved within 30 minutes of a ferry arrival or departure. This will allow unimpeded access to the ferry terminal for other road users. In addition, bulk materials (concrete aggregate, cement, cabling sand, etc) transported to Hoy will not utilise the existing scheduled ferries.

7.8 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

7.9 During operation, only site maintenance vehicles and local utility company vehicles will normally be required on the site. Up to two visits per week to the control building by maintenance personnel in four-wheel drive or conventional passenger vehicles will occur following the commissioning phase.

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

7.11 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 SNH, SEPA and OIC.

Decommissioning

7.12 The Applicant is seeking in-perpetuity consent for the Proposed Development. In the event of decommissioning, or replacement of turbines, it is anticipated that the levels of effect would be similar but of a lesser level than those during construction. Decommissioning would be undertaken in line with best practice processes and methods at that time and will be managed through an agreed Decommissioning Environmental Management Plan.

8 Consultation

8.1 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

8.2 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 Report.

9 Environmental Impact Assessment (EIA)

9.1 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);
- 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 travelling to, and from, 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);
- shadow flicker (effects caused by the passing of the turbine blades in front of the sun); and
- other issues (effects to telecommunications facilities, marine radar, outdoor access and calculation of carbon balance).

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

9.3 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.

9.4 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 16 of the EIA Report.

Landscape and Visual

9.5 The full assessment of landscape and visual receptors is found in Chapter 6 (Landscape and Visual) of the EIA Report. 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.

9.6 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, 17 Landscape Character Units (LCUs), seven Regional Coastal Character Areas (RCCAs), one designated landscape, 16 representative viewpoints and six principal visual receptors.

9.7 The effects of the Proposed Development are assessed as being relatively localised. The Zone of Theoretical Visibility models (ZTVs) illustrate a concentration of visibility across the south-east corner of Hoy and the surrounding small islands, with visibility becoming increasingly patchy towards the north of Hoy as higher hills screen visibility to an increasing extent. The openness of

Scapa Flow and the Pentland Firth means visibility extends out from the Proposed Development to the north, east and south to meet the coastal edges of the Mainland of Orkney, Burray, South Ronaldsay and Mainland Scotland. Visibility is typically concentrated along the facing coastal edges, albeit with patches extending inland over lower ground and higher facing slopes.

9.8 In respect of the physical effects on landscape elements, the assessment found that the direct effect on the rough moorland as a result of the construction of the Proposed Development will not be significant.

9.9 In respect of effects on landscape character, the assessment found there will be significant effects within a 6.5 km radius of the Proposed Development, with five Landscape Character Units (LCUs) either wholly or partially significantly affected. These LCUs are either close to the site on Hoy or cover nearby islands off the east and south coast from where a strong visual association with the site arises. In terms of coastal character, the Proposed Development will give rise to significant effects on three of the Regional Coastal Character Areas (RCCAs), also within a 6.5 km radius of the Proposed Development and largely owing to the strong association between the site and the surrounding coastal landscapes. All other RCCAs will not be significantly affected.

9.10 One of the 11 Special Landscape Qualities (SLQs) of the Hoy and West Mainland National Scenic Area (NSA) will be significantly affected, namely the High Hills of Hoy, across a localised area in the Moorland Hills LCT on the southern boundary of the designated area, between 5 km and 6.5 km from the Proposed Development. Three other SLQs will be affected by the Proposed Development but not significantly, while the remaining seven SLQs will not be affected.

9.11 To assess the effects on the Wild Land Qualities (WLQs) of the WLA, the Hoy WLA has been divided into a Sub-area East and Sub-area West. Four of the six Wild Land Qualities (WLQs) will be significantly affected where they are experienced in Sub-area East. In Sub-area West, while there will also be significant effects, these will occur in three small localised areas, while the majority of Sub-area West will remain unaffected by the Proposed Development.

9.12 In respect of effects on visual amenity, the assessment found that nine of the 16 viewpoints assessed will be significantly affected during the construction and operational phases of the Proposed Development. These viewpoints are all located within an approximate 10 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 10 km range will not be significantly affected as a result of the Proposed Development, owing to the greater distance and wider seascape and landscape influences.

9.13 In terms of the principal visual receptors assessed, it was found that residents of the two closest range settlements, namely Lyness and Longhope (Figure 3), will be significantly affected during the construction and operational phases. Road-users on the B9047, which connects these two settlements, will also be significantly affected along much of its length, with the exception of the northern section, where there will be no visibility. A significant effect will occur in respect of ferry passengers on the Lyness to Houton ferry between Cava and Lyness. In terms of core paths, walkers on H7 Wee Fea will be significantly affected owing to their especially close range and on the western section of F1 West Hill Circular, owing to the strong association between these opposing coastlines. These significant effects will all be relatively local, occurring within 9 km, with principal visual receptors beyond this extent not being significantly affected.

Figure 3: A photomontage showing the Proposed Development in operation from Longhope

9.14 There will be no significant cumulative effects largely owing to the very small number, small size and relatively distant location of the cumulative wind farms. This prevents wind farms becoming the prevailing characteristic of landscape character or visual amenity.

9.15 A Residential Visual Amenity Appraisal has considered the impact of the Proposed Development on the visual amenity of residents within a 2 km radius. The assessment found that, although many of the properties will be subject to significant effects, none of the predicted effects on visual amenity experienced at properties have potential to reach the 'Residential Visual Amenity Threshold'.

9.16 In summary, the Proposed Development will give rise to significant effects on landscape character during the construction and operation of the Proposed Development, albeit contained within the localised extent of approximately 6.5 km. It will give rise to significant effects on visual amenity out to approximately 10 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. In respect of the wider 40 km study area, all effects will be relatively close-range and this reflects the wider human influences which occur across the surrounding seascapes and landscapes. While the sensitivity of the island of Hoy is recognised through the NSA designation and WLA mapped interest, the Proposed Development would be located in the south-eastern corner of the island, which is already influenced by built development and a modified landscape. There will, nonetheless, be significant effects as a result of the Proposed Development in this localised area.

Ornithology

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

9.18 A comprehensive suite of field surveys was undertaken to evaluate the ornithological interests at the Proposed Development site covering two breeding seasons (2018 and 2019) and two non-breeding season periods (October 2018 to March 2019 and October 2019 to March 2020).

9.19 The likely significant effects on ornithological interests at the Proposed Development were assessed including noise and visual disturbance from construction activities, displacement (including barrier effects) due to presence and operation of the turbines and the risk of mortality due to collisions with operating turbines.

9.20 Important ecological features were identified and brought forward for assessment; these included four designated sites (Hoy Special Protection Area (SPA); Scapa Flow proposed SPA (pSPA); Hoy Site of Special Scientific Interest (SSSI) and Hoy and North Walls SSSI Moorland Fringes Local Nature Conservation Site (LNCS)) and eleven species (red-throated diver; peregrine falcon; great skua; great

black-backed gull; hen harrier; white-tailed eagle; merlin; short-eared owl; curlew; dunlin and snipe).

9.21 Species-specific mitigation measures will be required to avoid significant adverse effects from disturbance due to construction activities for breeding red-throated diver and hen harrier.

9.22 There would be no likely impact and no effect due to construction disturbance at any 'confirmed' or 'probable' short-eared owl breeding sites however implementation of mitigation measures, as good practice, would be required to avoid disturbance to two 'possibly occupied' short-eared owl sites.

9.23 There would be no impact and no significant effects of construction disturbance on roosting hen harrier or breeding merlin or great black-backed gull.

9.24 Construction disturbance is likely to lead to the temporary loss of between one and ten great skua (Figure 4) apparently occupied territories (AOTs). These AOTs are not on the SPA itself but are within the LNCS. This extent of loss, for one - two years only is a temporary, reversible affect and is assessed as a significant adverse effect at the less than local (site) level only, but not at any wider geographic scale. The effects on the LNCS are not considered to adversely affect the integrity of the area or the qualities for which it has been designated.

Figure 4: Great skua (Photo courtesy of Aquatera Ltd.)

9.25 The loss of four pairs of curlew due to construction disturbance, if this was to occur, would be a temporary but reversible effect and would be assessed as a significant adverse effect at the less than local (site) level only, but not at any wider geographic scale.

9.26 The loss of six - seven pairs of snipe due to construction disturbance, if this was to occur, would be a temporary but reversible effect and would be assessed as a significant adverse effect at the less than local (site) level only, but not at any wider geographic scale.

9.27 There would be no impact and no significant effects on breeding red-throated diver from the Hoy SPA population due to operational displacement or barrier effects. Any effects on the red-throated diver population of Scapa Flow pSPA is considered to be less than that of the Hoy SPA red-throated diver population as the pSPA population of red-throated divers is larger than that of the Hoy SPA as it includes all the birds from Hoy, plus those from the smaller islands in Scapa Flow and from the Mainland of Orkney parishes adjacent to Scapa Flow.

9.28 There would be no displacement and no significant effects on breeding, roosting or foraging hen harrier from the Orkney population. There would be no displacement and no significant effects on breeding merlin, great black-backed gull or dunlin at any scale and no displacement and no significant effects on breeding or foraging short-eared owl at any scale, due to presence and operation of the Proposed Development.

9.29 The loss of two pairs of curlews due to the combined displacement and collision mortality impact is assessed as a significant adverse effect at the less than local (site) level only, but not at any wider geographic scale. The effects on the LNCS are not considered to adversely affect the integrity of the area or the qualities for which it has been designated.

9.30 Displacement of breeding great skuas due to the presence and operation of the Proposed Development is considered to range from one pair (but breeding elsewhere on the LNCS) to six pairs (lost from the LNCS population), equivalent to ranging from an effect that is not significant at any scale to a significant adverse effect at the less than local (site) level, but not at any wider geographic scale. This is considered a precautionary approach as displacement may not occur at this level. The effects on the LNCS are not considered to adversely affect the integrity of the area or the qualities for which it has been designated. This does not affect any great skua pairs located on the Hoy SPA, so there is no impact and no effect on the Hoy SPA great skua population due to operational displacement.

9.31 Displacement of four pairs of snipe, a species of less than local importance, is not considered significant at any scale.

9.32 The effects of collision mortality on the Hoy SPA red-throated diver, peregrine, great skua and great black-backed gull populations were assessed as not significant. Likewise, the effects of collision mortality on breeding hen harriers from the Orkney population were also assessed as not significant.

9.33 There is a great deal of uncertainty around various aspects of the calculation of risk for white-tailed eagle, not least the very small population and the low number of observations at the Proposed Development. Given this, a conservative approach has been taken and collision mortality is assessed as a significant adverse effect on the adult Hoy white-tailed eagle population, at the regional scale.

9.34 The cumulative collision risk to the Hoy SPA red-throated diver, peregrine and great skua populations is essentially the same as that carried out for the Proposed Development on its own therefore no separate cumulative assessments are required for these species.

9.35 The cumulative collision risk estimates for hen harrier at 99.5 % avoidance, (considered suitably precautionary) would result in modelled declines of less than 3 % (relative to the baseline) in the Orkney female and Orkney male hen harrier populations over a 25-year period. The effects of these levels of cumulative collision mortality on the Orkney female and Orkney male hen harrier populations are assessed as not significant.

Ecology and Nature Conservation

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

9.37 Following consultation with OIC, SNH 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 (compiled for the desk study) and survey of the habitats and faunal interests of the site. The following field surveys were undertaken:

- habitats: extended National Vegetation Classification (NVC) habitat survey;
- fish habitat survey; and
- otter survey.

9.38 The primary habitats (listed in order of size) identified on site are:

- Blanket bog;
- Wet dwarf shrub heath;
- Dry dwarf shrub heath;
- Bracken;

- Coniferous woodland – plantation; and
- Marshy grassland.

9.39 A single stream, the Burn of Longigill, is present within the development footprint and flows directly south into the Burn of Ore, which is located c.300 m south of the nearest turbine. A concrete reservoir was recorded within the north of the study area and a number of small water bodies were recorded in association with blanket bog habitats.

9.40 Through a standardised evaluation method, Important Ecological Features (IEFs) were identified and brought forward for assessment. IEFs taken forward to assessment include:

- Hoy SAC and SSSI;
- Hoy and North Walls SSSI Moorland Fringes LNCS;
- Blanket bog;
- Dry dwarf shrub heath;
- Wet heath;
- Running water;
- Mountain hare; and
- Fish.

9.41 Potential impacts of the construction and operation phases are presented, prior to the assessment of effects. In line with guidelines, the impact assessment process assumes the application of standard mitigation measures.

9.42 With standard mitigation measures in place, likely effects from construction and operation were considered to be barely perceptible, and therefore not significant, with the exception of loss of wet heath and blanket bog habitats and the effects of these losses on the Hoy and North Walls SSSI Moorland Fringes LNCS. Given these effects, compensation is proposed in the shape of measures secured via a Habitat Management Plan (HMP). A species protection plan is also proposed to further minimise any adverse effects on mountain hare. With the compensation and further mitigation detailed, residual impacts for both construction and operation phases are considered to have barely perceptible adverse and therefore not significant effects on all IEFs.

9.43 Likely cumulative effects of nearby developments, consented or at application stage, were also considered; no significant cumulative effects are anticipated.

9.44 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

9.45 The full assessment of noise and vibration effects is provided in Chapter 9 of the EIA Report.

9.46 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.

9.47 The assessment of noise comprised consultation with Orkney Islands Council (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.

Figure 5: Noise surveying equipment

9.48 Noise effects from construction, including on-site activities and construction traffic, were found to be not significant. Noise effects from fixed non-turbine plant have been determined to be not significant.

9.49 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 Noise Sensitive Receptors (NSRs). Where necessary, this may require a noise management plan to be put in place. Residual noise effects due to operation are therefore not significant.

Cultural Heritage

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

9.51 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.

9.52 The assessment identified 163 non-designated heritage assets and two designated assets within the site, the majority of which date to military activity from the Second World War. The Proposed Development has been designed to avoid directly impacting upon the known below ground footprint of the Category A Listed Underground Oil Fuel Storage tanks underneath Wee Fea Hill.

9.53 The Proposed Development has also been designed so as to avoid impacts upon known heritage assets where possible. Given the density of known remains it has not been possible to avoid all impacts and there would be direct impacts on 13 non-designated heritage assets. All of these assets are military remains and comprise slit trenches, access tracks and earthwork and concrete remains relating to the construction and use of the Underground Fuel Reservoir and Communications Centre (Figure 6). Individually these assets are of local importance, but together they form part of a wider group of remains on the slopes of Wee Fea that formed a distinct sector relating to the construction and defence of the vital Underground Fuel Reservoir and wider defence of the Lyness Naval Base. The Proposed Development would impact upon a small proportion of this wider complex of remains, leading to some loss of information content. A moderate and significant direct effect on these remains has been predicted.

Figure 6: Formal Naval Command and Communication Centre

9.54 The presence of extensive peat cover across the site indicates the potential for historic environmental evidence to be contained within and underlying the peat. Additionally, the identification of archaeological remains of prehistoric to post-medieval date in and around the site indicate the potential for sub-surface archaeological deposits. A programme of archaeological works designed to record known remains, avoid inadvertent damage to known remains and to investigate and mitigate against the possibility of uncovering hitherto unknown remains will be undertaken. Following the implementation of mitigation measures there may be a slight loss of overall information content and as such a marginal magnitude of residual direct impact is anticipated. The residual direct effect would be negligible and not significant.

9.55 There would be a medium magnitude of impact on the setting of the Former Naval Headquarters and Communications Centre and the Underground Fuel Reservoir, Wee Fea; during construction of the Proposed Development which would necessitate heavy goods vehicles using the tracks adjacent to both monuments and the creation of a temporary construction compound within 30 m of the Communications Centre. The frequent passing of heavy goods vehicles and associated noise would temporarily interrupt and affect the ability to understand these monuments in their remote upland setting and there would be a moderate and significant effect on the setting of the Former Naval Headquarters and Communications Centre and a minor and not significant effect on the setting of the Underground Fuel Reservoir, Wee Fea during construction. The potential effects of construction activities upon setting would be temporary, short term and reversible and would cease on completion of construction.

9.56 Potential operational effects on the settings of designated heritage assets within the 5 km and 10 km study areas and selected assets within the 20 km study area were considered in detail as part of the assessment. Moderate and significant effects have been predicted upon the setting of the Category A Listed Former Naval Headquarters and Communications Centre, Wee Fea which is

located within the site boundary and upon the setting of the Category B Listed Royal Naval Cemetery at Lyness.

9.57 A Heritage Trail will be established within the site as compensatory mitigation to partially offset potential impacts of the Proposed Development on the setting of Second World War heritage assets in its vicinity and in particular the Category A Listed Former Naval Headquarters and Communications Centre.

9.58 There would be moderate and significant residual effects on the setting of the Category A Listed Former Naval Headquarters and Communications Centre, Wee Fea and the Category B Listed Royal Naval Cemetery at Lyness, although the core components and integrity of the setting of these assets would not be adversely affected.

9.59 The possibility of cumulative effects has been considered and assessed. No additional cumulative effects have been predicted.

Geology, Hydrology and Hydrogeology

9.60 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.

9.60.1 The largest watercourse within the site is the Burn of Ore at the southern boundary, into which most of the site area drains. Two unnamed burns and the Burn of Longigill flow from north to south across the site, into the Burn of Ore. All site drainage is ultimately to the sea on the east coast of Hoy, less than 1 km from the site boundary.

9.60.2 Site geology comprises Upper Old Red Sandstone sedimentary strata. This is overlain by peat across most of the site area, with depth varying from nil to locally over 3 m. In parts of the site, there is evidence of recent and older peat cutting (Figure 7), and other localised disturbance or excavation associated with historical wartime structures.

Figure 7: Evidence of recent peat cutting

9.60.3 A peat slide risk assessment has identified low and negligible risks at proposed turbine and infrastructure locations across the site. Low risks will be mitigated through micro-siting and/or targeted geotechnical/engineering controls, to be informed by detailed pre-construction site investigations.

9.60.4 There are no private water supplies located within 1 km of the site, although evidence of potentially moderately groundwater dependent habitats has been identified. Based on the site geology and topography, the habitats are interpreted as being at least partially surface water or rainwater fed.

9.60.5 Likely construction and operational effects include sedimentation or pollution of the water environment from surface runoff, compaction of

soils, the removal of peat, peat landslide hazard, and effects on groundwater quality and flow regime.

9.60.6 Standard/embedded mitigation measures include design iteration to appropriately buffer watercourses and avoid areas of deep peat wherever possible in siting turbines (taking account of other environmental and technical constraints). Standard good construction and design practice has also been considered as standard mitigation, including detailed pre-construction site investigations, agreement and implementation of a Construction Environmental Management Plan (CEMP), appropriate design of the single proposed watercourse crossing, and development of a detailed Drainage Strategy for the site.

9.60.7 The likely effects on hydrological, geological and hydrogeological receptors, taking account of the standard mitigation measures, have been assessed as minor or minor to moderate (not significant). However, some additional specific mitigation measures have been proposed to further reduce effects, including appropriate peat management and re-use on-site, and implementation of a Habitat Management Plan to restore degraded areas of blanket bog (peat deposits) on-site and in the local area.

9.61 The significance of residual effects on hydrological, geological and hydrogeological receptors is considered to be minor (not significant). No cumulative effects on hydrology, hydrogeology and geology are predicted.

Traffic and Transport

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

9.63 The assessment covers the likely traffic and transport effects associated with the construction and operation of the Proposed Development.

9.64 The Proposed Development will be accessed from the existing access track providing access to Wee Fea, to the west of Lyness. In order to construct the Proposed Development, bulk materials such as concrete and specialist loads such the turbine components will arrive on Hoy by ship and will be transported to site using specialist vehicles from Lyness Quay.

9.65 The construction activities will lead to increased traffic volumes on the B9047, B9048 and Wee Fea access track during the construction phase only.

9.66 Following commissioning of the Proposed Development, traffic flows will fall to approximately two vehicles every fortnight.

9.67 To ensure that there are no detrimental issues at Lyness, the Applicant will produce a Port Management Plan secured by planning condition that will be agreed prior to the delivery of the first turbine component.

9.68 The A964 is an A class local distributor road that provided connectivity from Kirkwall through to the communities of the south of the Mainland of Orkney. The road currently features HGV movements along its length and is an appropriate width to accommodate the construction traffic movements. The B9047 and B9048 are both B Class distributor roads and are both capable of accommodating regular HGV traffic as a result of their road width and geometry. The access track to Wee Fea is currently not suited to HGV traffic given its width, poor road surface condition and the provision of cattle grids.

9.69 Effects will be minimised through development of the Construction Traffic Management Plan (CTMP) which will be agreed with OIC and secured through an appropriately worded planning condition. The CTMP will outline such methods as a maximum speed limit and passing places on the Wee Fea access track the cleaning of vehicle chassis and wheels to prevent the deposition of construction site material on the road. The CTMP will be displayed in the site at all times.

9.70 An assessment of likely effect determined that moderate/minor, non-significant residual effects could be expected on the Wee Fea access track, relating to the increase in traffic operating on the route during construction. There are no residual effects associated with the operational phase of the Proposed Development.

Socio-economic, Recreation and Tourism

9.71 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.

9.72 The renewables industry is an important economic asset to the UK and Scotland and supports a substantial and growing number of employment opportunities. Although not significant, the Proposed Development will further contribute to the positive economic effect of renewable energy, and associated skills base within the UK and Scotland.

9.73 It is estimated that during the construction and development phase the Proposed Development could support £2.6 million Gross Value Added (GVA) and 39 jobs in Orkney, and £10.4 million GVA and 161 jobs in Scotland (including in 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 in Orkney). In addition, it would contribute to public finances around £0.5 million through the payment of non-domestic rates.

9.74 The Proposed Development would also contribute towards the achievement of the generating capacity mandated by Ofgem for the construction of an interconnector linking Orkney to the Scottish mainland, which could lead to annual benefits of between £55 and £476 per person in Orkney. In addition to potentially generating considerable socio-economic benefits, the presence of the interconnector would enable the further development of the renewable energy sector in Orkney.

9.75 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 is assessed as minor (beneficial).

9.76 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 is assessed as minor (beneficial) in Orkney.

9.77 The assessment of the economic impacts finds a temporary minor (beneficial) impact from the construction and development phase in Orkney and a temporary negligible (beneficial) impact in Scotland. Operation and maintenance spend from the Proposed Development is assessed as having a negligible (beneficial) impact on the local and national economy.

9.78 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 are assessed as moderate (beneficial) and significant.

9.79 Operational wind farms and the proposed Quanterness wind farm 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.

9.80 Adding together the economic impacts from the development and construction of the Proposed Development and of the proposed Quanterness Wind Farm, it was estimated that they could support a total £5.1 million GVA and 77 job years in Orkney, and £20.9 million GVA and 321 job years across Scotland (including in Orkney).

9.81 It is also estimated that the cumulative economic impact of the Proposed Development and the proposed Quanterness Wind Farm during the operations and maintenance phase could be £0.6 million GVA and eight jobs in Orkney and £1.1 million GVA and 17 jobs in Scotland (including in Orkney) each year. This cumulative effect is assessed as minor (beneficial).

9.82 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.

9.83 Visitor attractions were identified within 15 km of the Proposed Development and a further two attractions beyond that study area, Skara Brae and Skaill House were included within the assessment due to the numbers of visitors they receive. 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.

9.84 The assessment of effects on popular routes has considered 14 recreational trails and six core paths within 15 km of the Proposed Development. The closest of these is a section of the Lyness Wartime Trail and Wea Fea Hill path which passes through the Proposed Development site. During construction, use of the path would be restricted and therefore a minor adverse, non-significant effect would result. This effect would be temporary and fully reversible. During the operational period, the proposed creation of a Heritage Trail to improve access to, and understanding of, the heritage assets above Lyness would result in a long term minor beneficial effect which would not be significant. Assessment of the other routes finds 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.

9.85 Analysis of representative accommodation providers within a 15 km study area considered whether visitor behaviour would change due to the Proposed Development. A minor beneficial and not significant effect was identified on the Hoy Hotel, should it be used by construction workers. Analysis of the other accommodations within the study area found that none would be made unattractive to guests, as a result of the Proposed Development. Effects would be negligible, and non-significant, both during construction and operation of the Proposed Development.

9.86 Overall, there would be 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.

Aviation and Radar

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

9.88 No objections were received from consultation with NATS, Highlands and Islands Airports Ltd (HIAL), Orkney Islands Council Airfields, Kirkwall Airport and the Ministry of Defence (MoD).

9.89 The MOD noted that low flying may be a concern but having considered the site specifics no objection is expected.

9.90 The MOD requested lighting, which will be realised as infra-red lighting fitted to every turbine nacelle. This lighting will not be visible to the human eye.

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

Shadow Flicker

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

9.93 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.

9.94 The study area within which properties could potentially be affected by shadow flicker covers a distance of 10 rotor diameters from each turbine, with an additional 50 m applied for micro-siting purposes 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.

9.95 A shadow flicker assessment was undertaken at the 13 identified receptors within the study area. The worst-case modelling identified the potential for significant effects at a small number of properties, however the realistic (but still conservative) modelling shows that once wind data and average sunshine hours are applied, all receptors experience shadow flicker well below the accepted limits of less than 8 hours per year.

9.96 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.

9.97 No mitigation is considered to be required. However, the Applicant will provide a written Shadow Flicker Protocol document, setting out a protocol for addressing any complaint received from a receptor within the study area, and mitigation options available to address any such complaint. The Shadow Flicker Protocol will be agreed with OIC prior to operation of the Proposed Development.

9.98 The residual effect of shadow flicker is, therefore, expected to be not significant for all receptors during all phases of the Proposed Development.

Other Issues

9.99 The full assessment of other issues provided in Chapter 16 (Other Issues) of the EIA Report.

Telecommunication

9.100 An assessment of the likely effects of the Proposed Development on telecommunications infrastructure, both within the site and in the wider area was undertaken. Through implemented design changes the Proposed Development will have no residual effects on telecommunication.

Marine Radar

9.101 The likely effects of the Proposed Development on marine radar has been assessed.

9.102 Most of the potential impacts can be disregarded on the basis of their locations. Any remaining potential impacts are expected to be local and manageable, with competent radar operators both able and used to deciphering the radar picture containing some anomalies.

Outdoor Access

9.103 The likely effects on outdoor access during construction and operation have been assessed. Mitigation, to be agreed through a suitably worded condition, would ensure that residual adverse effects to Core Path H7 would be limited to minor, temporary, short-term and reversible effects during the construction period. Following construction, Core Path H7 would be subject to a number of long-term benefits. It would be directly connected to a further approximately 4 km of track providing improved access to the hills. Additionally, the proposed creation of a Heritage Trail (see Chapter 10 of EIA) to improve access to, and understanding of, the heritage assets above Lyness would result in a long-term minor beneficial effect. Improving access to the hills and access to historical and natural heritage directly relate to the key features of the North Walls core paths network as detailed within the Amended Orkney Core Paths Plan (2018). Whilst vehicular access to the Wee Fea viewpoint is not subject to the outdoor access legislation, the Applicant will look to keep vehicular access open where practical during construction. Following construction, vehicular access will be subject to long-term benefits, with upgraded tracks and the addition of passing places.

Carbon Savings

9.104 The Proposed Development is expected to take approximately 11 to 23 months (0.9 to 1.9 years) to repay the carbon exchange to the atmosphere (the CO2 debt) through construction of the wind farm. There are no current guidelines about what payback time constitutes a significant impact, however, this is a relatively small percentage of the lifespan of the Proposed Development (3.6 % to 7.6 % of the conservative 25 year lifespan assumed in the carbon calculator). Compared to fossil fuel electricity generation projects, which also produce embodied emissions during the construction phase and significant emissions during operation due to combustion of fossil fuels, the Proposed Development has a very low carbon footprint and after approximately 0.9 to 1.9 years, the electricity generated is estimated to be carbon neutral and will displace grid electricity generated from fossil fuel sources. The site would, in effect, be in a net gain situation following this time period and will then be contributing to national objectives of reducing GHG emissions and meeting the 'net zero' carbon targets by 2050. Therefore, the Proposed Development is evaluated to have an overall beneficial effect on climate change mitigation.

10 Conclusion

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

10.2 Within Chapter 17 (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 18 (Summary of Residual Effects) of the EIA Report summarises the likely environmental effects, the mitigation to be implemented and the resulting residual effects.