# Nisthill Wind Farm

## EIA Scoping Report

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| Client: | Nisthill Wind Farm Ltd |
| Project/Proposal No: | 3586 |
| Version: | 3.0 |
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# Document Information

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# Contents

# Abbreviations

| | |
|---|---|
| AIL | Abnormal Indivisible Loads |
| AOD | Above Ordnance Datum |
| ATC | Automated Traffic Count |
| BGS | British Geological Survey |
| BNG | British National Grid |
| BoCC | Birds of Conservation Concern |
| CAA | Civil Aviation Authority |
| CAP | Civil Aviation Publication |
| CEMP | Construction Environmental Management Plan |
| CIEEM | Chartered Institute of Ecology and Environmental Management |
| CIfA | Chartered Institute for Archaeologists |
| CoPA | Control of Pollution Act |
| COVID-19 | Coronavirus Disease 2019 |
| DECC | Department for Energy and Climate Change |
| DfT | Department for Transport |
| ECoW | Ecological Clerk of Works |
| EHO | Environmental Health Officer |
| EIA | Environmental Impact Assessment |
| GDL | Gardens and Designed Landscape |
| GIS | Geographic Information System |
| GWDTE | Ground Water Dependent Terrestrial Ecosystems |
| ha | Hectares |
| HEPS | Historic Environment Policy Scotland |
| HER | Historic Environment Record |
| HES | Historic Environment Scotland |
| HGV | Heavy Goods Vehicle |
| HIAL | Highlands and Islands Airport Limited |
| IEF | Important Ecological Features |
| IOA | Institute of Acoustics |
| km | Kilometre |
| LBAP | Local Biodiversity Action Plan |
| LCT | Landscape Character Type |
| LDP | Local Development Plan |
| LI | Landscape Institute |
| LLA | Local Landscape Area |
| LVIA | Landscape and Visual Impact Assessment |
| m | metre |
| MOD | Ministry of Defence |
| MW | Megawatt |
| NCAP | National Collection of Aerial Photography |
| NNR | National Nature Reserve |
| NPF | National Planning Framework |
| NRHE | National Record of Historic Environment |
| NRTF | National Road Traffic Forecasts |
| NSA | National Scenic Area |
| NTS | Non-Technical Summary |
| NVC | National Vegetation Classification |
| OIC | Orkney Island Council |
| OLWECS | Orkney Landscape Wind Energy Capacity Study |
| OPEN | Optimised Environments Limited |
| PAC | Pre-Application Consultation |
| PAN | Planning Advice Note |
| PLHRA | Peat Landslide Hazard and Risk Assessment |

| | |
|---|---|
| PWS | Private Water Supply |
| RSG | Raptor Study Group |
| RVAA | Residential Visual Amenity Assessment |
| SAC | Special Conservation Area |
| SBL | Scottish Biodiversity List |
| SPA | Special Protection Area |
| SPP | Scottish Planning Policy |
| SSSI | Sites of Special Scientific Interest |
| TA | Traffic Assessment |
| VP | Vantage Point |
| WFD | Water Framework Directive |
| WHS | World Heritage Site |
| WLA | Wild Land Areas |
| WLQ | Wild Land Qualities |
| ZTV | Zone of Theoretical Visibility |

# 1. Introduction

## 1.1 Background and Context

1.1.1 Nisthill Wind Farm Limited ('the Applicant') intends to apply to Orkney Islands Council (OIC) for permission to construct and operate Nisthill Wind Farm (hereafter referred to as the 'Proposed Development'), at site centre British National Grid (BNG) HY 30393 27104. The application will be supported by an Environmental Impact Assessment Report (EIA Report) as required by the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (hereafter referred to as the 'EIA Regulations'). This document forms the EIA Scoping Report submitted to OIC, on the context of the Environmental Impact Assessment (EIA) of the Proposed Development.

1.1.2 The Proposed Development will comprise of four wind turbines, each up to 180 m blade tip height. The total generating capacity is anticipated to be in the region of 26.4 MW. The associated infrastructure will include site access, internal access tracks, crane hardstanding, underground cabling, on-site substation and maintenance building, temporary construction compound(s) and borrow pit search area.

## 1.2 The Applicant

1.2.1 The Applicant 'Nisthill Wind Farm Limited', is a partnership between farmers Mr Adrian Breck of Ludenhill, Mr Paul Archibald of Nisthouse and Infinergy Ltd

1.2.2 Mr Breck and Mr Archibald are multigenerational Orcadian farmers and landowners of the Proposed Development site. Already Ludenhill Farm has contributed towards tackling climates change with the instalment of a 500kw wind turbine in 2016. Together the landowners hope to generate significantly more renewable energy with this Proposed Development.

1.2.3 Infinergy Limited is a renewable energy company developing onshore wind farms throughout the United Kingdom. The Applicant has expertise and experience needed to design, develop, build and operate wind energy developments. The Applicant is committed to helping meet the United Kingdom's renewable energy targets, whilst developing responsibly and putting the right sized wind farm in the right place. Infinergy is a member of trade organisations RenewableUK and Scottish Renewables. For more information please visit: http://www.infinergy.co.uk.

## 1.3 Environmental Impact Assessment

1.3.1 The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (hereafter referred to as the EIA (Scotland) Regulations 2017) require that before consent is granted for certain types of development, an EIA must be undertaken. The EIA (Scotland) Regulations 2017 set out the types of development which must always be subject to an EIA (Schedule 1 development) and other developments which may require EIA if they are above certain thresholds and are likely to give rise to significant environmental impacts (Schedule 2 development).

1.3.2 The Proposed Development falls within Schedule 2 (a) of the EIA (Scotland) Regulations 2017, as an installation involving 2 or more turbines. The Proposed Development has the potential to have significant environmental effects due to its size, location and the nature of the effects (e.g., the magnitude and spatial extent) as set out in Schedule 3 of the EIA (Scotland) Regulations 2017. Therefore, the Proposed Development qualifies as an "EIA Development" and the Applicant acknowledges that it will be subject to an EIA.

1.3.3 EIA is an iterative process, which identifies the potential environmental effects that in turn inform the eventual design of the proposals. It seeks to avoid, reduce, offset and minimise any adverse environmental effects through mitigation. It considers the effects arising during the construction, operation and decommissioning phases. Consultation is an important part of the EIA process and assists in the identification of potential effects and mitigation measures.

## 1.4 The Purpose of the EIA Scoping Report

1.4.1 Regulation 14 of the EIA (Scotland) Regulations 2017 provides for potential applicants to ask the planning authority to state in writing the information that ought to be provided within the EIA Report. The 'Scoping Opinion' is to be offered following discussion with the consultation bodies.

1.4.2 The Applicant recognises the value of the scoping approach and the purpose of this report is to ensure that relevant issues are identified, and to confirm that the assessment process described will meet legislative requirements.

1.3.3 This EIA Scoping Report:

- describes the existing site and its context;
- identifies key organisations to be consulted in the EIA process;
- establishes the format of the EIA Report;
- provides baseline information; and,
- describes potential significant effects and the proposed assessment methodologies for various technical assessments to be covered in the EIA Report.

## 1.5 The EIA Report

1.5.1 The structure of the EIA Report will follow the requirements of the EIA Regulations and other relevant good practice guidance. Essentially, the EIA Report will comprise five volumes:

- Volume 1 – Written Statement;
- Volume 2 – Figures
- Volume 3 – Visualisations and Photomontages;
- Volume 4 – Technical Appendices; and
- Volume 5 – Confidential Appendices (if required).

1.5.2 A non-technical summary (NTS) will also be provided.

1.5.3 Chapters 1 to 5 of Volume 1 will comprise:

- An introduction
- Overview of EIA Methodology
- Site selection and alternatives
- A description of the Proposed Development; and,
- A summary of the relevant policy and legislation

1.5.4 The remainder of Volume 1 will present an assessment of a range of environmental topics. Based on available baseline environment information and the details of the Proposed Development, the environmental topics have been scoped on the basis of the potential for significant environmental effects. This has determined the need to undertake impact assessment to investigate each potential effect. Each of the topics will be reported as a chapter of Volume 1. The EIA Report will reference figures and technical studies, which will correspond to Volumes 2 to 5. The following topics will be considered:

- Chapter 6: Landscape and Visual;
- Chapter 7: Ecology and Nature Conservation;
- Chapter 8: Ornithology;

- Chapter 9: Traffic and Transportation;
- Chapter 10: Noise;
- Chapter 11: Cultural Heritage;
- Chapter 12: Hydrology, Geology and Hydrogeology;
- Chapter 13: Shadow Flicker;
- Chapter 14: Socio-economics, Tourism and Recreation;
- Chapter 15: Aviation and Radar
- Chapter 16: Other Issues

1.5.5 The EIA Report will also include a schedule of mitigation measures and a summary of residual effects.

1.5.6 A standalone Planning Statement assessing the Proposed Development against all relevant planning and energy policy, along with a Pre-Application Consultation (PAC) Report explaining the consultation carried out with the local communities about the Proposed Development will also accompany the planning application.

# 2. Proposed Development

## 2.1 Site Description

2.1.1 The site is located approximately 5 km west of Birsay (refer to **Figure 2.1**) in OIC area. The site comprises of an area of approximately 120 hectares (ha). The Site is predominately grassland with gently sloping topography up to 107 m Above Ordnance Datum (AOD). The east site boundary of the site borders Loch of Swannay.

## 2.2 Proposed Development Description

2.2.1 The Proposed Development will consist of four stand-alone, three bladed horizontal axis turbines. An indicative layout is provided in **Figure 2.2** while the proposed locations are noted in **Table 2.1.**

***Table 2.1 Proposed Indicative Turbine Coordinates (BNG)***

| Turbine Number | X Coordinate | Y Coordinate |
|---|---|---|
| 1 | 329964 | 1027270 |
| 2 | 330455 | 1027012 |
| 3 | 330910 | 1027302 |
| 4 | 331012 | 1026849 |

2.2.2 Although the final specification of the turbines is not known at this time, they are likely to be up to 180 m in maximum tip height, each with a generating capacity of up to approximately 6.6 MW resulting in a total installed capacity of up to 26.4MW.

2.2.3 In addition to the turbines, associated works will be required for the following:

- turbine foundations;
- crane hardstanding;
- external transformer;
- on-site access tracks between turbines and from the point of access to the turbines;

- on-site substation;
- on-site electrical cabling between the turbines and the substation and energy storage system; and,
- temporary construction compound.

2.2.4 The parameters of the EIA will be such that an appropriate level of assessment is undertaken for a given hub height and rotor diameter, within the envelope of a maximum tip height. The indicative turbine locations will evolve in response to the ongoing detailed assessment work, taking consideration of the environmental effects, terrain, current land use, technical and health and safety issues. The parameters of the Proposed Development will be explicitly identified in the EIA Report to describe fully the Proposed Development for which planning permission is being sought.

2.2.5 Consent will be sought for an operational life of 40 years from the date of commissioning the turbines. Before the end of this period, a decision would be made as to whether the Proposed Development should be decommissioned and removed, refurbished or re-powered. The assessment reported within the EIA Report will assume that the Proposed Development will be decommissioned.

2.2.6 Based on the preliminary indicative layout being considered, the Proposed Development would provide a total generating capacity of up to approximately 26.4 MW (based on 4 turbines each with a 6.6 MW rated capacity).

2.2.7 Based on a total installed capacity of 26.4 MW and a community benefit contribution of £5,000 per MW of installed capacity, the Proposed Development could generate up to £132,000 per annum (£3.96 m over the project's lifetime) to support local groups and projects on the Orkney Islands.

## 2.3 Cumulative Developments

2.3.1 The EIA Regulations state that cumulative effects should be considered as a part of the EIA. It will therefore be important to consider the cumulative effects of the Proposed Development with other developments in the area, including those that are currently operational, consented and in planning. The cumulative assessment will also consider the cumulative effects of different elements of the Proposed Development on environmental media and sensitive receptors, and in particular the cumulative effects of different effects upon individual and groups of receptors.

# 3. Planning and Energy Policy Context

## 3.1 Introduction

3.1.1 This section presents a summary of relevant policies that will be taken into consideration to help inform the design and layout of the Proposed Development.

3.1.2 The EIA Report will set out the relevant policies that have been considered as part of the assessments undertaken as part of the EIA. A separate Planning Statement will provide a detailed appraisal of the Proposed Development against the relevant Development Plan policies, national planning policy and other material considerations.

3.1.3 The EIA Report will also concisely reference climate change policy and the contribution of the Proposed Development to the UK and Scottish Government's climate change goals and policy targets.

## 3.2 National Planning Policy

### National Planning Framework for Scotland (NPF 3, 2014)

3.2.1 The National Planning Framework (NPF) is a long-term strategy for Scotland and is the spatial expression of the Government Economic Strategy and plans for development and investment in infrastructure. The NPF identifies national developments and other strategically important development opportunities in Scotland and is accompanied by an Action Programme.

3.2.2 It is important to note that NPF 4 is currently being prepared by the Scottish Government. The draft NPF4 was published in November 2021, and provides a clear 'direction of travel' for new national level planning policy. It is anticipated that a final NPF4 will be published in Summer 2022.

### Scottish Planning Policy (2014)

3.2.3 Scottish Planning Policy (SPP) sets out national planning policies which reflect the Scottish Ministers' priorities for operation of the planning system and for land use and development. It aims to promote a sustainable place, supporting economic growth, regeneration and appropriately designed development.

3.2.4 The SPP principal policies include a presumption in favour of development that contributes to sustainable development, consideration of sustainable economic development, rural development, historic environment, landscape and natural heritage, transport, renewable energy, flooding and drainage and waste management.

## 3.3 The Development Plan

3.3.1 The statutory Development Plan applicable to the Proposed Development is:

- The Orkney Local Development Plan (LDP) (adopted April 2017);
- Supplementary Guidance 'Energy' (2017).

### The Orkney Local Development Plan

3.3.2 The LDP covers the whole of the OIC area and is to be updated every five years.

3.3.3 It is considered that the following key policies of the LDP are applicable to the Proposed Development:

- Policy 1: Criteria for all Development';
- Policy 7: Energy;
- Policy 8: Historic Environment & Cultural Heritage;
- Policy 9: Natural Heritage & Landscape; and,
- Policy 13: Flood Risk, SUDs & Waste Water Drainage.

3.3.4 The Supplementary Guidance references Policy 7 and sets out 'development criteria' covering:

- Communities and Amenity;
- Landscape and Visual Impact;
- Natural Heritage;
- Historic Environment;
- Tourism and Recreation;
- Peat and Carbon Rich Soils;
- Water Environment;

- Aviation, Defence and Communications; and,
- Construction and Decommissioning.

## 3.4 Climate Change and Energy Policy

3.4.1 Climate change has been described as the greatest environmental challenge facing the world today. The burning of fossil fuels to produce electricity is a major contributor to climate change through the release of atmospheric carbon dioxide and other harmful gases known collectively as greenhouse gases.

3.4.2 The Proposed Development relates to the generation of electricity from renewable energy sources and comes as a direct response to national planning and energy policy objectives. The clear objectives of the UK and Scottish Governments will be summarised, in relation to encouraging increased deployment and application of renewable energy technologies, consistent with sustainable development policy principles and national and international obligations on climate change.

3.4.3 The Scottish Government's Energy Strategy (2017) set a target for the equivalent of 50% of the energy for Scotland's heat, transport and electricity consumption to be supplied from renewable sources by 2030. As heat and transport become decarbonised, demand for electricity from renewable sources can be expected to increase.

3.4.4 Further deployment of renewable energy generating technology will be required throughout the 2020s in order to meet the listed targets. As a mature technology, onshore wind development has a continuing and important role to play, as confirmed by national planning and energy policy and most recently in the Fourth National Planning Framework Position Statement.

3.4.5 The Scottish Government's Energy Strategy and Onshore Wind Policy Statement (2017) set out *inter alia* that onshore wind is to play a vital role in Scotland's future – helping to substantively decarbonise electricity supplies and the technology is expected to play a material role in growing the economy.

3.4.6 Scotland's overarching statutory target is to achieve a 100% reduction in greenhouse gas emissions to net-zero by 2045, with interim targets of 75% by 2030 and 90% by 2040, now provided for in the Climate Change (Scotland) Act 2009 as amended by the Climate Change (Emissions Reductions Targets) (Scotland) Act 2019 ("2009 Act") which came into force in March 2020.

3.4.7 The Scottish Government declared a climate emergency on 14 May 2019. The declaration of an "emergency" is a reflection of both the seriousness of climate change and its potential effects, and the need for urgent action to cut carbon dioxide emissions. The declaration is a material consideration which will be referenced.

3.4.8 The Proposed Development would clearly make a contribution to the attainment of renewable energy and electricity targets and emissions reduction at both the Scottish and UK levels and the quantification of this contribution would be described.

3.4.9 The EIA Report will summarise the renewable energy policy framework, but the detail will be provided in the supporting Planning Statement which will also make reference to key policy documents such as the Scottish Energy Strategy (2017) and the Onshore Wind Policy Statement (2017) and its proposed update (which was consulted on in late 2021 / early 2022) that will propose an additional onshore wind capacity target of 8-12GW to be delivered by 2030.

# 4. Landscape and Visual

## 4.1 Introduction

4.1.1 The Landscape and Visual Impact Assessment (LVIA) for the Proposed Development will be undertaken by Optimised Environments Ltd (OPEN).

4.1.2 This section of the Scoping Report sets out the proposed methodology and approach to be applied in the production of the LVIA. It also presents the suggested rationale for landscape and visual receptors to be scoped in and scoped out of the assessment process. Justification of the scope is presented through an initial baseline assessment of the relevant receptors, an initial assessment of their sensitivity to the Proposed Development and the likely magnitude of change arising as a result of the Proposed Development.

4.1.3 The purpose of the LVIA is to identify and record the potential significant effects that the Proposed Development may have on physical elements of:

- the landscape;
- landscape character;
- areas that have been designated for their scenic or landscape-related qualities;
- Wild Land Areas; and,
- views from various locations such as settlements, routes, hilltops and other sensitive locations.

4.1.4 The potential cumulative effects that may arise from the addition of the Proposed Development to other existing and planned developments are also considered.

4.1.5 The LVIA will consider the potential effects of the Proposed Development during the following stages:

- Construction and decommissioning; and,
- Operation.

## 4.2 Study Area

4.2.1 In accordance with guidance and with a proposed turbine height of up to 180 m, the Study Area for the LVIA of the Proposed Development will cover a radius of 45 km from the nearest turbine, as shown in **Figure 4.1.** This is considered to be the maximum radius within which a significant landscape and / or visual effect could arise given the height of the turbines that are being considered.

4.2.2 A review of the broad wind farm context within a 45 km radius has been undertaken, based on the latest NatureScot mapping of large-scale wind farm development. It is considered that any cumulative effects that would occur, would arise as a result of the pattern of development within the 45 km Study Area radius, rather than as a result of changes beyond this.

4.2.3 It is proposed that following a detailed review of the cumulative sites within the area, a plan will be produced showing the locations of wind farms within 45 km that are operational, under construction, consented or at application stage and where the turbines are greater than 50 m to blade tip. These developments would be included within the cumulative assessment for the Proposed Development. The Council and NatureScot will be consulted over the final list of sites to be considered within the detailed cumulative assessment. Exceptionally, scoping stage sites may also be included, at the request of the Council or NatureScot, where they are considered to be of specific relevance to the cumulative effect of the Proposed Development. Known cumulative wind farms within a 45 km Study Area are shown for scoping purposes in **Figure 4.6.**

## 4.3 Baseline Description

### Site and Context

4.3.1 The site is located on Hundland Hill (107 m AOD) in the northern part of the Western Mainland of Orkney. It is located approximately 3 km south of the north coast and set in a rural area comprising fields of improved pasture. It is enclosed by loch basins to the west and east and a broader extent of moorland hills to the south. Minor roads extend down the west and east of the hill to access a series of farmsteads and other rural properties. There is a small scale turbine on the eastern side of the hill.

4.3.2 West Mainland is characterised by low hills interspersed with loch basins. The coastal hills which sit close to the northern coast include Costa Hill (151 m AOD) to the north, Kirbuster Hill (102 m AOD) to the west and Hundland Hill itself, which is set between Loch Swannay to the north-east and Loch of Hundland to the south-west, with Loch of Boardhouse further to the south-west. A series of moorland hills and smaller lochs then extend to the south, including Greeny Hill (152 m AOD), Mid Hill (193 m AOD) and Burgar Hill (159 m AOD), with the high point at Mid Tooin (224 m AOD) marking the watershed between the north and south flowing rivers in West Mainland.

4.3.3 The landscape comprises a mix of enclosed farm fields and unenclosed moorland. The enclosed farm fields mostly contain improved pasture with some crops grown in the lower-lying and more sheltered locations. The open moorland comprises rough pasture and is use for hill sheep farming. The low-lying vegetation combined with the very limited extent of tree cover, creates an extremely open and exposed landscape, with long-ranging views where the landform is open or elevated.

4.3.4 This landscape is also characterised by a dispersed pattern of settlement and accessed by a fine network of roads. The relatively low-lying landform has meant that settlement has established extensively across this landscape, with only the upland moorlands remaining unsettled. There are few nucleated settlements, with rural properties typically occurring intermittently along rural roads. While the main roads are routed through the lower-lying coastal and loch basin areas, 'B' roads and minor roads extend across the upland landscapes.

4.3.5 Southern and western parts of West Mainland are covered by the Heart of Neolithic Orkney World Heritage Site (WHS), which denotes the international importance of some of the world's most famous archaeological sites including Skara Brae, Ring of Brodgar and Maeshowe, as well as hundreds of other sites. Development across West Mainland has remained relatively small in scale and rural in character, albeit with a larger concentration occurring at Stromness, where there is also a ferry port and some light industry.

4.3.6 Wind farm development has introduced a larger scale of development into rural parts of West Mainland with operational Burgar Hill and Hammars Hill Wind Farms set in the moorland hills close to the north-east coastal edge. While these are larger scale commercial developments, there are also a large number of smaller scale domestic turbines associated with farmsteads or rural properties dispersed across West Mainland.

### Landscape Character

4.3.7 Landscape character information produced by or prepared on behalf of NatureScot forms the basis of much of the characterisation of the Study Area). The original Landscape Character Assessment (LCA), which covers the 45 km Study Area, is the Scottish Natural Heritage Review 100: Orkney Landscape Character Assessment (SNH, 1998). NatureScot has reviewed and updated the 30 original LCAs and this information is contained in NatureScot's Landscape Character Assessment GIS dataset. In respect of the Study Area, the Landscape Character Types (LCTs) have not noticeably changed between the original Orkney Landscape Character Assessment and the updated data set.

4.3.8 Guidance on the NatureScot web page, advises that, where available, and where relevant to specific types of development, such as wind farms, capacity studies should take precedence over NatureScot's LCAs. The Orkney Landscape Wind Energy Capacity Study (OLWECS) was written by Land Use Consultants in 2014 and adopted by OIC in 2015. The OLWECS also uses the LCTs presented in NatureScot's original LCA and updated data set, and this information will be used as the basis of the assessment of effects on landscape character in the LVIA.

4.3.9 NatureScot's dataset and OLWECS divide the landscape into areas of distinctive character which are generally referred to as LCTs. Many of these LCTs are extensive, sometimes covering several areas that are geographically separate. In order to distinguish between different areas of the same LCT and identify these areas in respect of their specific location, a sub classification of Landscape Character Units (LCUs) has been applied for the purposes of the LVIA.

4.3.10 The eastern part of the site is located in the Loch Basin LCT and the western part of the site is located in the Coastal Hills and Heath LCT, as shown in **Figure 4.2**. While the Coastal Hills and Heath LCT extends along the northern coastline of West Mainland, beyond 3 to 4 km from the Proposed Development, there is only sea. Similarly, to the east while Coastal Basin LCTs are separated by intermittent Coastal Cliffs and Heath LCT and Cliffs LCT, this only extends out to 6 to 7 km from the Proposed Development with the North Atlantic beyond. Inclined Coastal Pasture LCT lines the eastern coast, with the Whaleback Island LCT of Egilsay and Wyre beyond and Moorland Hills LCT set behind the Inclined Coastal Pastures on the southern side of Rousay. To the south of the Proposed Development, the general pattern comprises Moorland Hills LCT down the eastern side of West Mainland, and Loch Basins LCT down the western side, with a band of Rolling Hill Fringe LCT separating them in the middle.

4.3.11 In addition to the assessment of effects on landscape character, the LVIA would also consider the effects on coastal character. The basis of this assessment is NatureScot's 2016 publication entitled 'Coastal Character Assessment: Orkney and North Caithness, which presents classification descriptions for Regional Coastal Character Areas (RCCAs) around the Orkney and North Caithness coastlines. These are shown in **Figure 4.2** and will be used as the basis of the assessment.

### Landscape Designations and Wild Land Areas

4.3.12 A number of areas within the 45 km Study Area have been attributed a landscape planning designation, as shown in conjunction with the ZTV in **Figure 4.3.** These include one nationally important National Scenic Area (NSA) and three Gardens and Designed Landscapes (GDLs). There are no regionally designated landscapes on Orkney. The site itself is not subject to any national landscape designations intended to protect landscape quality or scenery considered to be of national importance.

National Scenic Areas

4.3.13 National Scenic Area (NSA) is a conservation designation used in Scotland and administered by NatureScot. NSAs are protected through Scottish Planning Policy (Scottish Government, 2020). The purpose of the designation is to identify areas of exceptional scenery and to protect them from inappropriate development. The site is not covered by any national landscape designations intended to protect landscape quality. The Hoy and West Mainland NSA is the only NSA to occur in the 45 km Study Area and it is situated 10 km to the south of the Proposed Development. This NSA covers the southern part of West Mainland, coinciding with the Heart of Neolithic Orkney WHS, and the northern part of Hoy, covering the High Hills in this part of the island.

4.3.14 This assessment will consider the effects of the Proposed Development on the Special Landscape Qualities (SLQs) of the Hoy and West Mainland NSA. SLQs are defined as "the characteristics that individually, or when combined together, make an NSA special in terms of landscape and scenery." The SLQs of the Hoy and West Mainland NSA are documented in two reports: 'Scotland's Scenic Heritage' (Countryside Commission for Scotland, 1978), and 'Special Qualities of the Hoy and West Mainland NSA' (SNH, 2010), which supersedes the 1978 report. The assessment follows the approach set out in NatureScot's Working Draft 11 entitled 'Guidance for Assessing the Effects on Special Landscape Qualities' (SNH, November 2018).

Gardens and Designated Landscapes

4.3.15 Historic Environment Scotland is responsible for designating Gardens and Designed Landscapes (GDLs), which are protected through Scottish Planning Policy (Scottish Government, 2020). These are contained in an Inventory which can be accessed at http://www.historic-scotland.gov.uk/gardens. The descriptions contained in the Inventory identify the special qualities which merit the designation of each GDL. There are three nationally important GDLs within the 45 km Study Area as shown in **Figure 4.3**. These are Balfour Castle, at approximately 18 km to the east, Skaill House, at approximately 11 km to the south-west, and Melsetter House, at approximately 37 km to the south. The scope of the assessment in respect of all Cultural Heritage assets is presented in Chapter 9.

Wild Land Areas

4.3.16 Wild land is not an environmental designation and is not statutorily protected in the way that National Parks and NSAs are for their SLQs. It is, however, recognised in Scottish Planning Policy (Scottish Government, 2020) as a nationally important mapped resource, which should be afforded protection for its Wild Land Qualities (WLQs). The assessment of the effects on Wild Land Areas (WLAs) follows guidance set out in NatureScot's 'Assessing Impacts on Wild Land Technical Guidance' (NatureScot, 2020) with reference to the 'Description of Wild Land Areas' (SNH, 2017).

4.3.17 The Hoy WLA is the only NSA to occur in the 45 km Study Area and it is situated 27 km to the south of the Proposed Development. This WLA covers a small area in the central part of Hoy, where there are no roads or development. While the northern part of the WLA overlaps with the southern part of the Hoy and West Mainland NSA, the majority of the area is not protected for its scenic qualities.

### Visual Amenity

4.3.18 The assessment of the effects on visual amenity will be largely informed by representative viewpoints. For this Scoping Study, 18 viewpoints have been identified as shown in **Figure 4.4**. The final selection of viewpoints will be agreed through consultation with OIC and other relevant consultees including NatureScot.

4.3.19 The key characteristic of the 45 km Study Area is the openness that the landscapes and seascape present. This is derived from a combination of the very limited extent of tree cover, the predominance of farmland, the relatively low-lying landform of the island landscapes and the extent of seascapes and lochs around and in these islands. This results in open views which can often be wide-ranging, although there is some enclosure and containment from the small to medium hills that occur across the islands.

4.3.20 The extent of visual amenity is also a reflection of the extent to which patterns of settlement and roads are dispersed across the islands. On West Mainland, the hierarchy of 'A' and 'B' class roads, as well as minor roads and access tracks, spread across all parts, with the exception of the upland moorlands. This means there is a wide dispersal of residents and road-users, many of whom experience open views of the surrounding landscapes and seascapes form their properties, gardens, driving routes and walking routes. Principal Visual Receptor locations are shown with the ZTV on **Figure 4.5**.

4.3.21 Tourism is an important part of the economy of the Orkney Islands, with the Heart of Neolithic Orkney WHS forming one of the key attractions to visitors. This designation makes the landscape setting to many of the most sensitive archaeological sites an important factor. While there are no big hills in West Mainland, there are many coastal, loch-side and upland areas that attract walkers. There is also the St Magnus Way, which is a long-distance route, starting in Egilsay and extending across the north coast of West Mainland from Evie to Birsay and then through Dounby and onto Finstown, before eventually ending in Kirkwall.

4.3.22 The openness of the seascapes also means that residents, road-users and walkers on the surrounding islands experience views back to West Mainland, with Rousay located to the immediate north-east, Shapinsay to the east, and Hoy to the south. Locals and visitors use the local ferries and aeroplanes to travel between the islands, from which open views to surrounding islands also occur.

## 4.4 Guidance and Legislation

4.4.1 The following guidance, legislation and information sources will be considered in carrying out this assessment:

- Guidelines for Landscape and Visual Impact Assessment: Third Edition (Landscape Institute and IEMA, 2013)('GLVIA3');
- Visual Representation of Wind Farms Version 2.2 (SNH, February 2017);
- Assessing impacts on Wild Land Areas - Technical Guidance. (NatureScot, 2020);
- Guidance for Assessing the Effects on Special Landscape Qualities. (SNH DRAFT, 2018-2019);
- Technical Guidance Note 02/19 Residential Visual Amenity Assessment. (Landscape Institute, 2019);
- Technical Guidance Note 02/21 Assessing landscape value outside national designations (Landscape Institute, 2021);
- Guidance – Assessing the cumulative landscape and visual impact of onshore wind energy development. (NatureScot, 2021);
- Landscape Character Assessment Guidance for England and Scotland (SNH and TCA, 2002);
- Siting and Designing of Windfarms in the Landscape: Version 3 (SNH, 2017);
- Policy Statement No 02/02: Strategic Locational Guidance for Onshore Windfarms in Respect of the National Heritage (SNH, 2009);
- Spatial Planning for Onshore Wind Turbines – Natural Heritage Considerations Guidance (SNH, 2015); and
- Good Practice During Windfarm Construction, Version 4 (SNH, 2019).

## 4.5 Assessment Methodology

### Desk Study

4.5.1 The assessment has been initiated through a desk study of the site and 45 km radius Study Area, combined with a good working knowledge of this area. This study has identified aspects of the landscape and visual resource that will need to be considered in the LVIA, including:

- Landscape character typology;
- Landscape-related planning designations;
- Wild Land Areas (WLA);
- Potential cumulative wind farms;

- Routes (including roads, National Cycle Routes and long-distance walking routes); and
- Properties and settlements.

4.5.2 The desk study has also utilised Geographic Information System (GIS) software to explore the potential visibility of the scoping layout for the Proposed Development. The resultant Zone of Theoretical Visibility (ZTV) diagrams (**Figures 4.2** to **4.5**) have provided an indication of which landscape and visual receptors are likely to have key sensitivities to the Proposed Development.

### Categories of Effects

4.5.3 The LVIA is intended to determine the significant effects that the Proposed Development would have on the landscape and visual resource. For the purpose of assessment, the potential effects on the landscape and visual resource are grouped into the following categories:

4.5.4 **Physical effects:** physical effects are restricted to the area within the site and are the direct effects on the existing fabric of the site. This category of effects is made up of landscape elements, which are the components of the landscape such as rough grassland and moorland that may be directly and physically affected by the Proposed Development;

4.5.5 **Effects on landscape character:** landscape character is the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape and the way that this pattern is perceived. Effects on landscape character arise either through the introduction of new elements that physically alter this pattern of elements or through visibility of the Proposed Development that may alter the way in which the pattern of elements is perceived. This category of effects is made up of landscape character receptors, which fall into two groups; landscape character types and landscape-related designated areas;

4.5.6 **Effects on the special qualities of the National Scenic Area (NSA):** a Special Landscape Qualities Impact Assessment is carried out to cover the potential for significant effects on the landscape qualities as identified in the NatureScot published report for each NP or NSA, including in some cases, qualities such as a sense of wildness/seclusion/remoteness;

4.5.7 **Effects on views:** the assessment of the effects on views is an assessment of how the introduction of the Proposed Development would affect views throughout the Study Area. The assessment of effects on views is carried out in relation to representative viewpoints and the views obtained by principal visual receptors (people) at certain locations;

4.5.8 **Effects on views from properties:** Residential Visual Amenity Assessment (RVAA) will be carried out for properties within 2 km in accordance with Landscape Institute (LI) technical guidance;

4.5.9 **Effects of turbine lighting:** should visible aviation lighting be required, a night-time visual impact assessment will be prepared to assess the potential visual impact of the turbine lights; and

4.5.10 **Cumulative effects:** cumulative effects arise where the Study Areas for two or more wind farms overlap so that both of the wind farms are experienced at a proximity where they may have a greater incremental effect, or where wind farms may combine to have a sequential effect. In accordance with guidance, the LVIA assesses the effect arising from the addition of the Proposed Development to the cumulative situation.

### Assessment Approach

4.5.11 The objective of this assessment for the Proposed Development is to predict the likely significant effects on the landscape and visual resource. In line with the EIA Regulations, the LVIA effects are assessed to be either significant or not significant. The significance of effects is assessed through a combination of two considerations: the sensitivity of the landscape receptor or view and the magnitude of change that would result from the addition of the Proposed Development.

4.5.12 The geographic extent over which the landscape and visual effects would be experienced is also assessed, which is distinct from the size or scale of effect. This evaluation is not combined in the assessment of the level of magnitude but instead is used in determining the extent in which a particular magnitude of change is experienced and the extent of the significant and non-significant effects. The extent of the effects would vary depending on the specific nature of the development proposed and is principally assessed through analysis of the geographical extent of visibility of the Proposed Development across the visual receptor.

4.5.13 The duration and reversibility of effects on views are based on the period over which the Proposed Development is likely to exist and the extent to which the Proposed Development will be removed, and its effects reversed at the end of that period. Duration and reversibility are not incorporated into the overall magnitude of change and may be stated separately in relation to the assessed effects.

4.5.14 The 'nature of effects' relates to whether the effects of the Proposed Development are adverse, neutral or beneficial. Guidance provided in GLVIA3 states that "thought must be given to whether the likely significant landscape and visual effects are judged to be positive (beneficial) or negative (adverse) in their consequences for landscape or for views and visual amenity" but does not provide an indication as to how that may be established in practice. The nature of effect is therefore one that requires interpretation and reasoned professional opinion.

4.5.15 OPEN generally adopts a precautionary approach which assumes that significant landscape and visual effects will be weighed on the negative side of the planning balance, although positive or neutral effects may arise in certain situations.

## 4.6 Proposed Mitigation

4.6.1 Mitigation embedded through the selection of the site and the design of the layout, is most relevant in the aim to reduce potential effects on landscape and visual receptors. The selection of the site has taken into consideration maintaining a considerable distance from the especially sensitive West Mainland and Hoy NSA and Hoy WLA.

4.6.2 The layout of the site keeps all four turbines fairly well contained in the area of Hundland Hill, to create a compact group and avoid encroachment towards residential properties and spread into other landscape areas.

4.6.3 The iterative design process will further test out the layout in respect of other environmental and technical constraints to ensure a robust proposal. This will include testing the appearance of the layout as seen from key representative viewpoints in the area, with potential fine-tuning of turbine positions to be applied.

## 4.7 Potential Impacts

### Assessment of Effects on Landscape Character

4.7.1 The ZTV in **Figure 4.2** shows that visibility is largely concentrated within the first 10 km, extending across the northern part of West Mainland and the southern coast of Rousay. While the northern and western sectors of the Study Area mostly comprise sea and not land, visibility does spill out across Wide Firth to reach Shapinsay Island to the east, and southwards across West Mainland and Scapa Flow to reach Hoy.

4.7.2 The proposed approach for the assessment of effects on landscape character is to consider LCTs that lie within 20 km of the Proposed Development. This is in response to the relatively contained extent of theoretical visibility shown in the ZTV in **Figure 4.2**, based on the scoping layout. While visibility does extend south to Hoy and Graemsay, the separation distance of more than 20 km, combined with the number of turbines being limited to four and the occurrence of closer range operational wind farms, would moderate the potential effects of the Proposed Development and make it unlikely that it would redefine the character of the LCTs on these and more distant islands.

4.7.3 **Table 4.1** Preliminary Assessment of Effects on Landscape Character Typesbelow lists LCTs / LCUs that lie within a 20 km radius of the Proposed Development and provides information about their distance to the scoping layout and relationship to the ZTV, as shown in **Figure 4.2.** Thereafter, each is assessed in the final column, whether or not, in OPEN's opinion, these areas should be scoped in or out of the assessment – this is unless changes to the layout during the detailed design process materially alter the potential for significant effects. The boxes that are shaded grey will be assessed further within the LVIA.

4.7.4 Agreement from OIC and NatureScot to the proposed scope for the assessment of effects on landscape character is sought through this scoping exercise in order to enable the LVIA to be focussed on key considerations and likely significant effects.

*Table 4.1 Preliminary Assessment of Effects on Landscape Character Types*

| LCT / LCU | Nearest turbine approx. (km) | Subject to theoretical visibility? | Need to assess further within LCT? |
|---|---|---|---|
| 296 Whaleback Islands LCT | | | |
| 296A Eynhallow LCU | 5 | Yes | Yes, owing to the relative proximity of this LCU to the Proposed Development and the close association between the facing coastlines. |
| 296B Wyre LCU | 11 | Yes | No, owing to the separation distance between the LCU and the Proposed Development, the closer association with Rousay to the north, the closer range influence from operational Hammars Hill and Burgar Hill Wind Farms and the screening effect of the intervening coastal landform. |
| 296C Egilsay LCU | 15 | Yes | No, owing to the very limited visibility on the southern tip of the island and the closer association with Rousay. |
| 296D Gairsay LCU | 13 | Yes | No, owing to the separation distance between the LCU and the Proposed Development, the closer association with Gorseness to the south-west and Shapinsay to the south-east, the closer range influence from operational Hammars Hill and Burgar Hill Wind Farms and the screening effect of the intervening coastal landform. |
| 297 Ridgeline Islands LCT | | | |
| 297 Shapinsay LCU | 18 | Yes | No, owing to the separation distance between the LCU and the Proposed Development, the closer range influence from operational Hammars Hill and Burgar Hill Wind Farms and the screening effect of the intervening coastal landform. |
| 298 Low Island Pastures | | | |
| 298 Rousay | 15 | No | No, owing to no theoretical visibility of the Proposed Development. |
| 301 Coastal Basin LCT | | | |

| LCT / LCU | Nearest turbine approx. (km) | Subject to theoretical visibility? | Need to assess further within LCT? |
|---|---|---|---|
| 301A Mar Wick LCU | 5.5 | Yes | No, owing to the limited extent of visibility along the eastern and southern edge of the LCU with the majority of the LCU remaining unaffected. |
| 301B The Spord LCU | 8 | Yes | No, owing to the limited extent of visibility along the eastern edge of the LCU with the majority of the LCU remaining unaffected. |
| 301C Isbister LCU | 9 | No | No, owing to no theoretical visibility of the Proposed Development. |
| 301D Rousay LCU | 12 | No | No, owing to no theoretical visibility of the Proposed Development. |
| 302 Inclined Coastal Pasture | | | |
| 302A Evie LCU | 1.5 | Yes | Yes, although visibility is shown on the ZTV in Figure 4.2 to be patchy, this LCU is close enough for significant effects to potentially arise. |
| 302B Rousay LCU | 7 | Yes | Yes, visibility is shown on the ZTV in Figure 4.2 to be almost continuous along the western part of this LCU. |
| 302C Coubister LCU | 12 | No | No, owing to no theoretical visibility of the Proposed Development. |
| 302D Quanterness LCU | 16 | No | No, owing to no theoretical visibility of the Proposed Development. |
| 302E Bay of Ireland LCU | 16 | Yes | No, owing to the separation distance between the LCU and the Proposed Development, the screening effect of the intervening interior landform and the closer range influence from Stromness and the Bay of Ireland. |
| 302F Stromness LCU | 18 | No | No, owing to no theoretical visibility of the Proposed Development. |
| 303 Rocky Coastal Pasture | | | |
| 303 Stromness LCU | 16.5 | Yes | No, owing to the separation distance between the LCU and the Proposed Development, the screening effect of the intervening interior landform and the closer range influence from Stromness and Loch of Stenness. |
| 304 Isolated Coastal Knolls | | | |
| 304A Gorseness LCU | 9.5 | No | No, owing to no theoretical visibility of the Proposed Development. |
| 304B Vishall Hill LCU | 5.5 | Yes | Yes, although visibility on the ZTV in Figure 4.2 to be limited to Vishall Hill, the relative proximity combined with the close range influence from |

| LCT / LCU | Nearest turbine approx. (km) | Subject to theoretical visibility? | Need to assess further within LCT? |
|---|---|---|---|
| | | | Hammars Hills and Burgar Hill Wind Farms, means there is potential for a significant effect and significant cumulative effect. |
| 305 Enclosed Bays LCT | | | |
| 305A Birsay LCU | 4.5 | Yes | Yes, although this LCU is orientated westwards towards the sea, the relative proximity of the Proposed Development and its location in the backdrop to this coastal LCU means that there is the potential for a significant effect to arise. |
| 305B Skaill LCU | 9 | Yes | No, owing to the limited extent of visibility along the southern edge with the majority of the LCU remaining unaffected. |
| 305C Woodwick LCU | 8 | No | No, owing to no theoretical visibility of the Proposed Development. |
| 306 Coastal Hills and Heath LCT | | | |
| 306A North Coast LCU | 0 | Yes | Yes, owing to the almost continuous visibility across this LCU as shown in the ZTV in Figure 4.2 and the location of the Proposed Development in this LCU. |
| 306B Ravi Hill LCU | 4 | Yes | Yes, owing to the relative proximity of this LCU to the Proposed Development, despite the patchier extents of visibility as shown on the ZTV in Figure 4.2. |
| 306C Vestra Fiold LCU | 6.5 | Yes | Yes, owing to the relative proximity of this LCU to the Proposed Development, and the almost continuous extents of visibility as shown on the ZTV in Figure 4.2. |
| 306D Quholm | 11.5 | Yes | No, owing to the separation distance between this LCU and the Proposed Development, the closer association with the coast to the west and the limited extent of theoretical visibility as shown on the ZTV in Figure 4.2. |
| 306E Rousay LCU | 7 | Yes | Yes, owing to the relative proximity of this LCU to the Proposed Development, and the continuous extent of visibility across the southern half of the LCU as shown on the ZTV in Figure 4.2. |
| 307 Cliffs LCT | | | |
| 307A Marwick Head LCU | 6 | Yes | Yes, owing to the relative proximity of this LCU to the Proposed Development and the almost continuous visibility as shown on the ZTV in Figure 4.2, despite the association of this coast with the Atlantic Ocean to the west. |

| LCT / LCU | Nearest turbine approx. (km) | Subject to theoretical visibility? | Need to assess further within LCT? |
|---|---|---|---|
| 307B Outshore Point LCU | 8 | No | No, owing to no theoretical visibility of the Proposed Development. |
| 307C Neban Point LCU | 11.5 | Yes | No, owing to the separation distance from the Proposed Development, the association of this coast with the Atlantic Ocean to the west and the very limited extents of visibility as shown on the ZTV in Figure 4.2. |
| 309 Peatland Basin LCT | | | |
| 309A Hillside LCU | 2 | Yes | Yes, owing to the close proximity of this LCU to the Proposed Development, and the continuous extents of visibility as shown on the ZTV in Figure 4.2. |
| 309B Settiscarth LCU | 9 | No | No, owing to no theoretical visibility of the Proposed Development. |
| 309C Rousay LCT | 8 | Yes | No, owing to the |
| 310 Loch Basin LCT | | | |
| 310A Swannay LCU | 0 | Yes | Yes, owing to the continuous visibility across this LCU as shown in the ZTV in Figure 4.2 and the location of the Proposed Development in this LCU. |
| 310B West Mainland LCU | 0.5 | Yes | Yes, owing to the very close proximity of the northern part of this LCU to the Proposed Development and the broad extents of theoretical visibility shown on the ZTV in Figure 4.2. |
| 310C Kirbister LCU | 17.5 | Yes | No, owing to the separation distance and the very limited extent of theoretical visibility shown on the ZTV in Figure 4.2. |
| 313 Rolling Hill Fringe LCT | | | |
| 313A Hillside LCU | 1 | Yes | Yes, owing to the very close proximity of this LCU to the Proposed Development and despite the limited extents of theoretical visibility shown on the ZTV in Figure 4.2. |
| 313B West Mainland LCU | 2 | Yes | Yes, owing to the very close proximity of the northern part of this LCU to the Proposed Development and the broad patches of theoretical visibility shown on the ZTV in Figure 4.2. |
| 313C Quholm LCU | 13 | Yes | Yes, owing to the broad patches of theoretical visibility shown on the ZTV in Figure 4.2. |
| 313D Settiscarth LCU | 9 | No | No, owing to no theoretical visibility of the Proposed Development. |

| LCT / LCU | Nearest turbine approx. (km) | Subject to theoretical visibility? | Need to assess further within LCT? |
|---|---|---|---|
| 313E Quanterness LCU | 14 | No | No, owing to no theoretical visibility of the Proposed Development. |
| 314 Moorland Hills LCT | | | |
| 314A West Mainland LCU | 0.5 | Yes | Yes, owing to the very close proximity of this LCU to the Proposed Development and the relatively broad extents of theoretical visibility shown on the ZTV in Figure 4.2. |
| 314B Ward Hill LCU | 15.5 | Yes | No, owing to the separation distance from the Proposed Development, the limited extent of theoretical visibility across this LCU and the closer range influence from Hammars Hill and Burgar hill wind farms. |
| 314C Keelylang Hill LCU | 13.5 | Yes | No, owing to the separation distance from the Proposed Development, the limited extent of theoretical visibility across this LCU and the closer range influence from Hammars Hill and Burgar hill wind farms. |
| 314D Rousay LCU | 7.5 | Yes | Yes, owing to the relative proximity of this LCU to the Proposed Development, the orientation of much of the landform towards the Proposed Development, despite the limited extents of theoretical visibility shown on the ZTV in Figure 4.2. |

### Assessment of Effects on Landscape Designations and Wild Land Areas

4.7.5 The ZTV in **Figure 4.3** shows visibility occurring across parts of the Hoy and West Mainland NSA, over ranges between 10 and 20 km. While it is considered unlikely that the Proposed Development would have a significant effect on the SLQs of this NSA owing to the small number of turbines proposed, the separation distances of over 10 km and the existing influence from closer operational wind farms, it is proposed that a detailed assessment of the effects is carried out as part of the LVIA. This presents a cautionary approach and will follow guidance set out in NatureScot's 'Guidance for Assessing the Effects on Special Landscape Qualities' (SNH, November 2018) and with reference to NatureScot's 'Special Qualities of the Hoy and West Mainland NSA' (SNH, 2010).

4.7.6 The ZTV in **Figure 4.3** shows small patches of visibility on the north facing slopes of the hills in the northern part of the Hoy WLA at a minimum distance of 27 km. The limited extent of visibility, combined with the notable separation distance and the closer range influence from other operational wind farms means that the Proposed Development will not give rise to significant effects on the Hoy WLA. It is, therefore, proposed that this WLA is scoped out of the assessment.

4.7.7 The ZTV in **Figure 4.3** shows that there would be no visibility of the Proposed Development from Balfour Castle GDL and Melsetter House GDL and, therefore, it is proposed that these GDLs be scoped out of the assessment.

4.7.8 While the ZTV shows theoretical visibility of one or two turbines to occur from Skaill House GDL, this limited visibility would comprise only blades, would occur from a minimum of approximately 11 km and would be seen in the context of closer range operational wind farms. It is, therefore, proposed that Skaill House GDL also be scoped out of the assessment.

4.7.9 The scope of the assessment in respect of Cultural Heritage assets is presented in Chapter 9.

4.7.10 Agreement from the Council and NatureScot to the proposed scope for the assessment of effects on landscape designations and Wild Land Areas is sought through this scoping exercise in order to enable the LVIA to be focussed on key considerations.

### Assessment of Effects on Representative Viewpoints

4.7.11 The LVIA will undertake an assessment of the likely visual effects of the Proposed Development through consideration of the specific visual effects at a selection of representative viewpoints and by considering the wider effects on visual amenity with reference to the views of principal visual receptors. Representative viewpoints and principal visual receptor locations are shown in conjunction with the scoping layout ZTV in **Figures 4.4** and **4.5** respectively.

4.7.12 Visualisations and figures will be produced to NatureScot's standards as set out in 'Visual Representation of Wind farms: Version 2.2' (SNH, February 2017). In line with NatureScot guidance, it is proposed that photomontages will be prepared for viewpoints where they are located within a 20 km radius of the outermost turbines.

4.7.13 A preliminary viewpoint list is shown in **Table 4.2** Preliminary List of Representative Viewpoints below, along with the visual receptors they represent. The locations of the viewpoints are shown in **Figure 4.4**. The final list will be established through fieldwork and the scoping process and in agreement with the Council and NatureScot. The viewpoints have been selected to represent sensitive visual receptors with the potential to undergo significant effects. They have also been selected to represent landscape receptors and with consideration of the potential for cumulative effects to arise.

4.7.14 Agreement from the Council and NatureScot to the proposed list of representative viewpoints is sought through this scoping exercise in order to enable the LVIA to be focussed on key considerations.

***Table 4.2 Preliminary List of Representative Viewpoints***

| ID | Viewpoint | Grid Reference | Distance to nearest turbine (km) | Receptors represented |
|---|---|---|---|---|
| 1 | A966, Loch of Swannay | 330411 / 1029575 | 2.2 | Road-users / Residents |
| 2 | A966, Hundland Road junction | 329279 / 1028675 | 1.4 | Road-users / Residents |
| 3 | Vinquin Hill, Costa | 331924 / 1028384 | 1.5 | Road-users / Residents |
| 4 | Mid Hill | 333552 / 1024910 | 3.2 | Walkers / Visitors |
| 5 | Kirbuster, Loch of Hundland | 328859 / 1026069 | 1.7 | Road-users / Residents |
| 6 | Brough of Birsay | 323803 / 1028505 | 6.1 | Walkers / Visitors |
| 7 | A967, Birsay Community Hall | 325314 / 1026733 | 4.5 | Road-users / Residents |
| 8 | A967, Twatt | 326737 / 1024702 | 4.1 | Road-users / Residents |
| 9 | A967, near Rosemire | 326816 / 1021608 | 6.3 | Road-users / Residents |
| 10 | A967, near Queena | 326168 / 1016775 | 11.0 | Road-users / Residents |

| | | | | |
|---|---|---|---|---|
| 11 | Ring of Brodgar | 329321 / 1013390 | 13.6 | Walkers / Visitors |
| 12 | Vishall Hill | 338634 / 1025024 | 7.8 | Walkers / Residents |
| 13 | Westside, Rousay | 337403 / 1029801 | 7.0 | Walkers / Residents |
| 14 | Hillock Road, Shapinsay | 353892 / 1022291 | 23.2 | Residents / Road-users |
| 15 | Ward Hill, Hoy | 322852 / 1002261 | 26.1 | Walkers |

### Assessment of Effects on Principal Visual Receptors

4.7.15 In addition to the effects of the Proposed Development on representative viewpoints, the assessment will also consider the effects on the principal visual receptors. While the representative viewpoints will be assessed in respect of receptors associated with the area around each viewpoint, the inclusion of the principal visual receptors will be used to present the sequential assessment from roads, paths and ferry routes covering longer distances.

4.7.16 The ZTV in **Figure 4.5** shows the extent to which theoretical visibility would affect principal visual receptors in a 20 km radius around the Proposed Development. Those routes which would require to be assessed in detail include the A966, A967, St Magnus Way Pilgrim's Route, National Cycle Route 1 and the Rousay, Egilsay and Wyre ferry route.

### Assessment of Cumulative Effects

4.7.17 GLVIA3 (Landscape Institute and IEMA 2013, p120) defines cumulative landscape and visual effects as those that "*result from additional changes to the landscape and visual amenity caused by the proposal in conjunction with other developments (associated with or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future*."

4.7.18 NatureScot's guidance, Assessing the Cumulative Impact of Onshore Wind Energy Developments (NatureScot, 2021) is widely used across the UK to inform the specific assessment of the cumulative effects of windfarms. Both GLVIA3 and NatureScot's guidance provide the basis for the methodology for the cumulative assessment that will be undertaken in the LVIA. NatureScot (2021) presents the following guidance:

4.7.19 "*The purpose of a Cumulative Landscape and Visual Impact Assessment (CLVIA) is to describe, visually represent and assess the ways in which a proposed wind farm would have additional impacts when considered with other consented or proposed wind farms. It should identify the significant cumulative impacts arising from the proposed wind farm*."

4.7.20 "*The assessment should be proportionate to the likely impacts and all CLVIA should accord with the guidelines within GLVIA3. The emphasis should be on the production of relevant and useful information, highlighting why the proposals assessed have been included and why others have been excluded, rather than the provision of a large volume of information*."

4.7.21 In line with guidance (NatureScot, 2021), the LVIA will focus on the key cumulative impacts which are likely to influence decision making, rather than assessing every potential cumulative effect.

4.7.22 The objective of the cumulative assessment will be to determine whether effects on landscape and visual receptors, when seen or perceived cumulatively with other projects, will be significant or not significant. Significant cumulative seascape, landscape and visual effects arise where the addition of the Proposed Development, leads to wind farms becoming a prevailing landscape or visual characteristic of a receptor that is sensitive to such change. The main assessment will consider effects of the Proposed Development against the baseline of operational wind farms, while the cumulative assessment will consider the effects against the baseline of operational, under-construction, consented and application stage wind farms.

### Assessment of Effects on Residential Visual Amenity

4.7.23 While effects on individual properties will not be assessed in this LVIA, those that lie within a 2 km radius of the Proposed Development will be included in the RVAA. The RVAA will be prepared in accordance with the Landscape Institute's Technical Guidance Note 2/19 'Residential Visual Amenity Assessment' (RVAA). This guidance sets out the 'Steps' to be followed when undertaking a RVAA and highlights how it should be informed by the principles and processes of GLVIA3. The purpose of the RVAA is to identify those properties where the effect of the Proposed Development leads to the 'Residential Visual Amenity Threshold' being reached or, in other words, where the effect could be described as overwhelming or overbearing. The Study Area is set at a 2 km radius in line with the maximum radius recommended in the technical guidance. The RVAA will consider the effect on views from each property, as well as views from the associated garden grounds and access tracks. Field work will be undertaken from publicly accessible locations, and considered in conjunction with aerial photography, in order to ascertain these potential effects.

### Assessment of Effects on Night-time Lighting

4.7.24 A key factor in the development of turbines greater than 150 m in height is the likely requirement for them to have visible red, medium intensity (2,000 candela) lights fitted to turbines in accordance with Civil Aviation Authority (CAA) guidance. The details of the lighting requirements for the Proposed Development are currently being defined along with potential mitigation measures.

4.7.25 OPEN will, if required, prepare a night-time impact assessment section and visualisations illustrating turbine lighting at night, for inclusion in the LVIA. The hub height ZTV will be used to identify where there would be direct line of sight of the lights from the surrounding area. OPEN has undertaken night-time lighting assessments and visualisations for several other wind farm projects in the UK which will inform the approach to assessment of turbine lighting and the basis of our professional judgement about the level of effect arising from the proposed lighting.

4.7.26 In order to inform this assessment, OPEN will take photographs from three of the readily accessible viewpoints at dusk with photographs to be taken after the period of civil twilight. OPEN will prepare visualisations to represent the effects of lighting on these views. It is proposed that the following three viewpoints be used to represent the effects of night-time lighting;

- Viewpoint 2: A966, Hundland Road junction;
- Viewpoint 3: Vinquin Hill, Costa; and
- Viewpoint 8: A967, Twatt.

4.7.27 These have been selected to represent the effects on road-users and residents in this local area who would be most likely to be affected. Night-time visualisations will be prepared in accordance with NatureScot guidance.

## 4.8 Receptors and Impacts Scoped In or Out of Assessment

### Landscape Receptors Scoped In

- All LCTs / LCUs highlighted in **Table 4.1** Preliminary Assessment of Effects on Landscape Character Types as having the potential to undergo significant effects will be assessed in detail in the LVIA.
- The Hoy and West Mainland NSA will be assessed in detail in the LVIA.

### Landscape Receptors Scoped Out

- All LCTs / LCUs outwith a 20 km radius of the Proposed Development and all LCTs / LCUs within a 20 km radius but highlighted in **Table 4.1** Preliminary Assessment of Effects on Landscape Character Types as not having the potential to undergo significant effects will be not assessed in detail in the LVIA.

- The Balfour Castle GDL, Skaill House GDL and Melsetter House GDL will not be assessed in detail in the LVIA.
- The Hoy WLA will not be assessed in detail in the LVIA.

### Visual receptors Scoped In

- All representative viewpoints listed in **Table 4.2** Preliminary List of Representative Viewpoints will be assessed in detail in the LVIA.
- Views from the A966 and A967 will be assessed in detail in the LVIA.
- Views from the St Magnus Way and National Cycle Route 1 will be assessed in detail in the LVIA.
- Views from the ferry routes between Rousay, Egilsay and Wyre will be assessed in detail in the LVIA.

### Visual Receptors Scoped Out

- All other viewpoints and principal visual receptors.

## 4.9 Scoping Questions to Consultees

- Do you have any comments on the proposed methodology?
- Are you in agreement with the proposed 45 km Study Area?
- Are you in agreement that the assessment of the effects on landscape character receptors should focus on those LCTs/LCUs which are highlighted as being relevant to the LVIA in **Table 4.1** Preliminary Assessment of Effects on Landscape Character Types**?**
- Are you in agreement that the assessment of the effects on landscape designations and WLAs should include only the Hoy and West Mainland NSA?
- Do you have any comments or suggestions in relation to the Preliminary Representative Viewpoint Locations shown in **Table 4.2** Preliminary List of Representative Viewpoints and illustrated in **Figure 4.4**?
- Do you have any comments on the approach to assessing effect on residential visual amenity?
- Do you have any comments on the approach to assessing the effects of turbine lighting?
- Do you have any comments or suggestions on the approach to the cumulative landscape and visual assessment?

# 5. Ornithology

## 5.1 Introduction

5.1.1 This section considers the potential for significant effects on avian ecology which may result from the construction and operation of the Proposed Development. The assessment will follow the Chartered Institute of Ecology and Environmental Management Guidelines (CIEEM) for Ecological Impact Assessment in the UK and Ireland (2018).

5.1.2 The ornithology chapter of the EIA Report will present the following:

- A summary of consultation responses.
- A description of the existing ornithological baseline for the Proposed Development site (the "site") and wider ecological Study Area within 500 m and 2 km of the site boundary (the zone of influence).
- A description of international, national and local sites designated for birds, such as Special Protection Areas (SPAs), Ramsar Wetlands, Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Conservation Sites (LNCSs) will be undertaken within 5 km of the Proposed Development. These are detailed in **Table 5.1** Statutory designated sites within 5 km and non-statutory sites within 2 km of the Site
- A review of existing historical records of protected or otherwise notable species of birds will also be completed. This will be done through consultation with the Orkney Raptor Study Group (RSG) and the Orkney Biodiversity Records Centre (OBRC).
- An assessment of the potential significant ornithological impacts of the Proposed Development (including collision risk).
- Proposals for appropriate mitigation to ameliorate identified potential impacts (where appropriate).
- An assessment of the residual potential significant impacts following the implementation of mitigation.

5.1.3 Ornithological features scoped into the assessment have been informed by key legislative and policy drivers, as they relate to nature conservation in Scotland, and include:

- Sites designated for their nature conservation value via:
  - the Conservation (Natural Habitats, &c) Regulations (1994);
  - the Wildlife and Countryside Act (1991);
  - National/local planning policy; and
  - National/local nature conservation policy (including the Ancient Woodland Inventory (AWI)).
- Species and habitats offered legislative or policy protection via:
  - the Conservation (Natural Habitats, &c) Regulations (1994);
  - the Wildlife and Countryside Act (1991); and
  - National/local planning

5.1.4 This Scoping exercise has been undertaken in accordance with the Guidelines for Baseline Ecological Assessment (Institute of Environmental Assessment, 1995) and the Guidelines for Ecological Impact Assessment in the UK (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018). It aims to provide a brief outline of the existing ornithological conditions of the site and local area, give an overview of the legal and planning policy drivers for the assessment, and describe the studies, which will be undertaken to further define the baseline, as well as the impact methodology which will be followed.

## 5.2 Baseline Description

5.2.1 The Proposed Development consists predominantly of agricultural grassland, wet heath and blanket bog used to rear livestock, mainly cattle. In the centre of the site is a single, existing wind turbine. The Loch of Swannay is located off the eastern site boundary, and the wider landscape comprises of similar habitats with widely scattered residential properties.

5.2.2 No statutory designated sites are present within the site boundary. Statutory designated sites within 5 km of the site, and non-statutory sites within 2 km, featuring both avian and non-avian designations are listed in **Table 5.1** Statutory designated sites within 5 km and non-statutory sites within 2 km of the Site, below, and shown on **Figure 5.1**.

***Table 5.1 Statutory designated sites within 5 km and non-statutory sites within 2 km of the Site***

| Name and Designation | Qualifying features | Distance at closest point |
|---|---|---|
| Loch of Swannay LNCS | The Site comprises the loch itself, fringing marshy grassland along parts of the shore (round much of the loch, improved grassland reaches to or very nearly to the shore), and some nearby rough grassland. Features of note include several habitats and its bird assemblage (including red-throated diver and waders) | Inside and adjacent to the east of the Site |
| Orkney Mainland Moors SPA | Designated for supporting populations of European importance of the Annex 1 Species of:<br>- Hen harrier (*Circus cyaneus*);<br>- Red-throated diver (*Gavia stellata*); and<br>- Short-eared owl (*Asio flammeus*) | 0 km – adjacent to southern boundary of Site. |
| West Mainland Moorlands SSSI | Designated for:<br>- Blanket bog; and<br>- Breeding bird assemblage. | 0 km – adjacent to southern boundary of Site. |
| Loch of Hundland LNCS | This site comprises the Loch of Hundland and areas of marsh at its northern and southern ends. Features of note include several habitats and its bird assemblage (including birds of prey, red-throated diver and waders) | 0.04 km – west of the Site boundary |
| Glims Moss and Durka Dale SSSI | Designated for:<br>- Mire habitats;<br>- Valley fen habitats; and<br>- Raised bog habitat. | 1.5 km south of Site boundary. |
| Costa Hill, Evie/Birsa LNCS | An area of heather moorland with patches of grassland. Features of note include several habitats and its bird assemblage (including peregrine and waders). | 1.5 km northeast of the Site boundary |
| Loch of Boardhouse LNCS | The Site comprises the loch, areas of marsh and marshy grassland at its south-eastern end, and the lower course of the Burn of Kirbister where it enters the loch. Features of note include several habitats and its bird assemblage (including red-throated diver, wintering wildfowl and waders). | 1.9 km ot the west of the Site boundary |

| | | |
|---|---|---|
| North Orkney SPA | Designated for supporting populations of European importance of the Annex 1 Species of:<br>- Great northern diver (*Gavia immer*), non-breeding<br>- Red-throated diver (*Gavia stellata*), breeding<br>- Slavonian grebe (*Podiceps auritus*), non-breeding<br><br>And regularly supporting a population of European importance of:<br>- Velvet scoter (*Melanitta fusca*), non-breeding | 3.7 km east of Site boundary |
| Loch of Banks SSSI | Designated for:<br>- Basin fen habitats;<br>- Breeding bird assemblage. | 3.9 km south west of Site boundary |
| Loch of Isbister and the Loons SSSI | Designated for:<br>- Basin fen;<br>- Breeding bird assemblage. | 4.6 km south west of Site boundary |

5.2.3 Please note, both of the two Local Nature Reserves on Orkney are located beyond the 2 km search distance and considered beyond potential connective distance of the Site.

## 5.3 Guidance and Legislation

### Legislation

5.3.1 Relevant legislation documents will be taken into account as part of this ornithological assessment. Of particular relevance are:

- Council Directive 2009/147/EC on the conservation of wild birds (i.e. the "Birds Directive");
- The Ramsar Convention on Wetlands (1975);
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended);
- The Wildlife and Countryside Act 1981 (as amended) (WCA);
- The Wildlife and Natural Environment (Scotland) Act 2011 (as amended);
- The Nature Conservation (Scotland) Act 2004 (as amended);
- The Scottish Biodiversity Strategy, with Scottish priority species and habitats listed on the Scottish Biodiversity List (SBL), is also pertinent and is based on the former UK Biodiversity Action Plan (UK BAP);
- The Orkney Local Biodiversity Action Plan (LBAP) 2018 to 2022 (Orkney Local Biodiversity Action Plan Steering Group, 2018); and
- Stanbury et al. (2015), Birds of Conservation Concern (BoCC) 5: the Population Status of Birds in the United Kingdom, Channel Islands and the Isle of Man.

### Guidance

5.3.2 As well as detailed consultation with NatureScot (formerly Scottish Natural Heritage,SNH), current best practice guidance on assessing ornithological interests in relation to onshore wind farm developments will be followed, of particular relevance to ornithology are the following:

- Guidelines for Ecological Impact Assessment (EcIA) in the UK and Ireland (CIEEM, 2018);
- Survey Methods for Use in Assessing the Impacts of Onshore Wind Farms on Bird Communities (SNH, 2017);
- Assessing Connectivity with Special Protection Areas (SPAs) (SNH, 2016);
- Windfarms and Birds: Calculating a Theoretical Collision Risk Assuming No Avoiding Action (SNH, 2000);

- Use of Avoidance Rates in the NatureScot Wind Farm Collision Risk Model (SNH, 2018);
- Developing field and analytical methods to assess avian collision risk at wind farms (Band et al., 2007); and

5.3.3 Assessing the Cumulative Impact of Onshore Wind Energy Developments (SNH, 2012).

### Planning Policy

5.3.4 The planning chapter of the EIA Report will set out the planning policy framework that is relevant to the EIA process. The policies set out include those from:

- Orkney Local Development Plan (LDP) (see Section 3.3 of this report);
- Relevant aspects of Scottish Planning Policy (SPP) (see Section 3.2 of this report); and
- Planning Advice Notes and other relevant guidance.

## 5.4 Proposed Scope of Study

### Study Area

5.4.1 Ornithology surveys will cover the Proposed Development site and appropriate survey buffers according to the established and recommended guidance (SNH, 2017).

### Study Methodology

5.4.2 The following ornithological surveys have been completed at the Site:

- Vantage Point (VP) survey: at the time of writing this scoping report, 18 months of Vantage Point survey has been completed (covering two non-breeding and one breeding season) from two VP locations (as shown on **Figure 5.2**, along with the viewshed form each VP location);
- Breeding bird survey (2021 season): consisting of four site visits during the breeding months following an adapted Brown & Shepherd method (Gilbert et al., 1998) and with a survey Study Area extending 500 m beyond the potential turbine area; and,
- Breeding raptor survey (2021 season): following methods described in Hardey et al. (2013), consisting of four survey visits during the breeding months. The survey Study Area extended 2 km beyond the potential turbine area (where access permissions allowed).

### Desk Study

5.4.3 A desk-based study for the Proposed Development and wider ornithology Study Area will be undertaken will confirm the designations and provide further, relevant information, (such as population sizes, etc.).

5.4.4 The desk study will additionally seek to identify records of protected or notable species within 2 km of the Site (5 km for species listed on Schedule 1 of the WCA) from statutory and non-statutory organisations; for example, local bird groups and other non-statutory groups, including the Orkney Raptor Study Group (RSG).

### Vantage Point (VP), Breeding Raptor and Breeding Bird Surveys

5.4.5 VP surveys started in September 2020 and are currently ongoing, with breeding raptor and bird surveys also planned for the start of the 2022 season.

5.4.6 NatureScot guidance recommends a typical survey period covering two years (SNH, 2017). Given that the Site is located adjacent to the Orkney Mainland Moors SPA, for which a considerable body of monitoring data exists, it is proposed that a full two years of survey is not required. However, this will be verified on review of the quality of site condition monitoring data that the Orkney RSG or NatureScot hold for the SPA. This will be confirmed following review of the data available and in agreement with NatureScot.

5.4.7 Given the Site's proximity to the Orkney Mainland Moors SPA, it is acknowledged that as part of the planning application information will be required to inform a Habitats Regulation Appraisal (HRA) by the Orkney Islands Council as the competent authority.

### Collision Risk Modelling

5.4.8 The following steps are proposed to inform the assessment of collision risk that will be undertaken in accordance with NatureScot's 'Collision Risk Model' (SNH, 2000):

- Review all digitised flight lines and recorded characteristics for target species (species, number of birds, start time of flight, etc.) from the survey work;
- Define a turbine envelope and identify all flights which are at any point within the dimensions of the rotor height and which intersect the boundary of the turbine envelope;
- Calculate the number of transits through the turbine envelope per unit of observation time and extrapolate to determine total predicted transits over the period of interest at risk height; and,
- Run the collision model with relevant turbine and ornithological parameters, taking as input the total transits calculated previously.

## 5.5 Assessment Methodology

5.5.1 In accordance with the CIEEM (2018) guidelines, the Ornithology chapter for the EIA Report will present a description of the ornithological baseline for the Proposed Development site and wider ornithology Study Area.

5.5.2 The findings of the survey work will be analysed and presented in one or more technical reports providing baseline conditions of the Site.

5.5.3 Activities during the construction, operation and decommissioning phases and their potential significance on valuable or vulnerable ornithological features will be identified and direct and indirect effects, including collision risk, will be assessed, taking account of the above guidelines and the geographical scale at which they are significant. Potential cumulative ornithological effects will also be agreed through consultation for an area up to 20 km from the Site boundary and/or Natural Heritage Zone (where applicable). The assessment will additionally present mitigation measures, as required, and assess any residual effects.

## 5.6 Proposed Mitigation

5.6.1 If it is considered that mitigation is necessary to reduce any adverse environmental effects on bird populations, mitigation will be proposed in the ornithological chapter to reduce the significance of these effects to an acceptable level. During the Proposed Development design process mitigation measures will seek to follow the recognised hierarchy of avoidance, reduction, enhancement, and compensation.

5.6.2 All ornithological mitigation will be incorporated into a Construction Environmental Management Plan (CEMP). This CEMP, to be confirmed, will outline all required mitigation and provide details on timelines for undertaking mitigation for each identified ornithological receptor. This CEMP will also outline a timetable of actions and form part of the contract documents to ensure delivery of mitigation specified in the ornithology chapter. In addition, the CEMP should incorporate the provision of an Ecological Clerk of Works (ECoW) to oversee the implementation of any recommended mitigation.

## 5.7 Potential Impacts

5.7.1 The key ornithology issues to be considered for the Proposed Development will include the following:

- Potential for Schedule 1 or other notable raptors, and divers, to be displaced by the Proposed Development or suffer direct mortality through collision with turbines, particularly for qualifying species of the Orkney Mainland Moors SPA;
- Potential for breeding birds (including waders) within or adjacent to the Site to be disturbed and/or displaced as a result of the Proposed Development (individuals may also collide with the turbines); and,
- Cumulative collision risk associated in combination with other windfarms in the local area.

## 5.8 Scoping Questions to Consultees

- Do consultees agree with the identified receptors and impacts to be included within EIA?
- Do consultees agree with the proposed ornithological survey scope and methodology, in particular the reduction in the required survey period to support a robust EcIA?
- Are there any developments or infrastructure schemes which should be taken into account when considering potential cumulative ornithological impacts?
- Do NatureScot hold relevant monitoring data for the qualifying species of the Orkney Mainland Moors SPA and are they willing to shar such data under licence agreement?

# 6. Ecology

## 6.1 Introduction

6.1.1 The Ecology chapter of the EIA Report will assess the potential significant effects on non-avian ecology and nature conservation features during the construction, operation and decommissioning phases of the Proposed Development. As described in Section 5, the EIA Report will include a separate Ornithology chapter.

6.1.2 The Ecology chapter of the EIA Report will present the following:

- A summary of consultation responses.
- A description of methods used to define the non-avian ecology baseline conditions and for undertaking the EcIA.
- A description of international, national and local sites designated for their non-avian species and habitats, such as Special Areas of Conservation (SACs), Special Sites of Scientific Interest (SSSIs), National Nature Reserves (NNRs) within 5 km of the Proposed Development and Local Nature Reserves (LNRs), Scottish Wildlife Trust (SWT) reserves, woodland listed on the Ancient Woodland Inventory (AWI) and Local Nature Conservation Sites (LNCSs) within 2 km. A review of existing records of protected or otherwise notable species will also be conducted.
- A description of the existing ecology baseline for the Site and wider ecological Study Area up to 250 m from the boundary of the Site ('zone of influence') including habitat types and evidence of any protected and priority species (including European Protected Species, and/or Scottish Biodiversity List (SBL) / Local Biodiversity Action Plan species).
- An evaluation of the ecological baseline with identification of Valued Ecological Features (IEFs) brought forward to EcIA.
- An assessment of the potential significant ecological effects of the Proposed Development in isolation as well as potential cumulative effects.
- Proposed mitigation to improve identified potential effects (where appropriate) as well as any proposed habitat management or enhancement measures.
- An assessment of the potential residual significant effects following the implementation of mitigation

6.1.3 The Ecology chapter of the EIA Report will be supported by a number of technical appendices.

6.1.4 This Scoping Report has been undertaken in accordance with the Guidelines for Baseline Ecological Assessment (Institute of Environmental Assessment, 1995) and the Guidelines for Ecological Impact Assessment in the UK (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018). It aims to provide a brief outline of the existing ecological conditions of the Site and local area, give an overview of the legal and planning policy drivers for the assessment, and describe the studies, which will be undertaken to further define the baseline, as well as the impact methodology which will be followed.

## 6.2 Baseline Description

### Field Survey

6.2.1 An extended Phase 1 habitat survey was undertaken in September 2021 of the Site and surrounding areas to assess the baseline conditions. The study concluded that the Site and its surroundings supports several important habitats, particularly blanket bog and wet heath, which are priority habitats the Scottish Biodiversity List (SBL) and the Orkney LBAP (Orkney Local Biodiversity Action

Plan Steering Group, 2018). Please see **Figure 6.1** for the Phase 1 habitats recorded during the survey.

6.2.2 The Proposed Development Site consists predominantly of agricultural grassland, wet heath and blanket bog used to rear livestock, mainly cattle. In the centre of the Site is a single existing wind turbine. The Loch of Swannay is located east of the Site boundary and the wider landscape comprises of similar habitats with widely scattered residential properties.

6.2.3 No statutory designated sites are present within the Site. Statutory ecological designated sites within 5 km of the study site are listed in **Table 6.1** and **Figure 5.1** presents those statutory and non-statutory sites designated for both ecological and ornithological interest which lie within 5 km or 2 km, respectively, of the Site boundary.

***Table 6.1 Statutory designated sites within 5 km and non-statutory sites within 2 km of the Site***

| Name and Designation | Qualifying features | Distance at closest point |
|---|---|---|
| Loch of Swannay LNCS | The Site comprises the loch itself, fringing marshy grassland along parts of the shore (round much of the loch, improved grassland reaches to or very nearly to the shore), and some nearby rough grassland. Features of note include several habitats and its bird assemblage (including red-throated diver and waders) | Inside the southeast of the Site and adjacent to the eastern boundary. |
| West Mainland Moorlands SSSI | Designated for:<br>- Blanket bog; and<br>- Breeding bird assemblage. | 0 km – adjacent to southern boundary of Site. |
| Loch of Hundland LNCS | This site comprises the Loch of Hundland and areas of marsh at its northern and southern ends. Features of note include several habitats and its bird assemblage (including birds of prey, red-throated diver and waders) | 0.04 km – west of the Site boundary |
| Glims Moss and Durka Dale SSSI | Designated for:<br>- Mire habitats;<br>- Valley fen habitats; and<br>- Raised bog habitat. | 1.5 km south of Site boundary. |
| Costa Hill, Evie/Birsa LNCS | An area of heather moorland with patches of grassland. Features of note include several habitats and its bird assemblage (including peregrine and waders). | 1.5 km northeast of the Site boundary |
| Loch of Boardhouse LNCS | The Site comprises the loch, areas of marsh and marshy grassland at its south-eastern end, and the lower course of the Burn of Kirbister where it enters the loch. Features of note include several habitats and its bird assemblage (including red-throated diver, wintering wildfowl and waders). | 1.9 km ot the west of the Site boundary |
| Loch of Banks SSSI | Designated for:<br>- Basin fen habitats;<br>- Breeding bird assemblage. | 3.9 km south west of Site boundary |
| Loch of Isbister Special SAC | The qualifying features for the SAC are:<br>- Otter (*Lutra lutra*);<br>- Eutrophic lakes; and<br>- Transition mires and quaking bogs. | 4.6 km south west of Site boundary |
| Loch of Isbister and the Loons SSSI | Designated for:<br>- Basin fen;<br>- Breeding bird assemblage. | 4.6 km south west of Site boundary |
| Eynhallow SSSI | Designated for:<br>- Common seal (*Phoca vitulina*) – important haul out site. | 4.7 km north east of Site boundary |

6.2.4 Please note, both of the two Local Nature Reserves on Orkney are located beyond the 2 km search distance and considered beyond potential connective distance of the Site. Furthermore, there are no LNRs or stands of AWI woodland within 2 km of the Site boundary.

### Habitats

6.2.5 Following the extended Phase 1 habitat survey, the main habitats identified during the field survey are presented on **Figure 6.1** and included the following:

- Improved grassland;
- Marshy grassland;
- Wet dwarf shrub heath;
- Wet heath/acidic grassland mosaic;
- Blanket bog; and
- Quarry.

### Protected/Notable Species

6.2.6 **Plants**: No notable plant species, or invasive plant species were recorded during the field survey and existing records of such species have not been identified in the desk study to date.

6.2.7 **Fungi**: No notable records of fungi were identified during the desk study, to date.

6.2.8 **Invertebrates:** Four records of great yellow bumblebee (*Bombus distinguendus*) were identified during the desk study, approximately 850 m east of the Site boundary, on the opposite side of Loch of Swannay. No flower-rich meadows or machair were noted within the survey area, which are the habitats typical of supporting this SBL priority species.

6.2.9 **Fish:** No notable records of fish were identified during the desk study. No significant watercourses are present within the Site boundary; however, Loch of Swannay is located along the boundary to the east. SEPA Water Environment Hub1 shows the loch has high suitability for fish migration and good water quality.

6.2.10 **Roosting Bats -** No suitable buildings or trees offering potential for roosting bats were recorded within the Site boundary.

6.2.11 **Commuting and Foraging Bats** - The on-site habitats offer no or few linear features, which commuting bats of several species are associated with. Although habitats on Site may be suitable for some prey species, the Site is relatively open and exposed. Overall, the Site provides low suitability for foraging or commuting bats.

6.2.12 **Otter (*Lutra lutra*):** No signs of otter were recorded during the extended Phase 1 survey. Historical records (>10 years old) of otter were returned in the desk study; these were associated mainly with Loch of Hundland, approximately 1.5 km south west of the Site. Loch of Swannay offers potential to support foraging otter, with the loch likely supporting populations of fish. No suitable holt sites were recorded within 200 m of the Site, with the banks of the loch near the Site boundary being mainly flat.

### Other Notable Species

6.2.13 **Orkney Vole (*Microtus arvalis orcadensis*):** No results were returned for this species during the desk study; however, four mammal burrows were noted along the banks of a drainage channel in the north east of the Site, which were considered to be large enough to potentially be burrows of Orkney vole. No other field signs were noted around the burrow

## 6.3 Guidance and Legislation

### Legislation

6.3.1 Relevant legislation and guidance documents have been reviewed and will be taken into account as part of this ecological assessment. Of particular relevance are:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (the "Habitats Directive");
- The Wildlife and Countryside Act 1981 (as amended) (WCA);
- The Ramsar Convention 1975;
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland) (the "Habitats Regulations);
- The Conservation of Habitats and Species Regulations 2010 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2011 (as amended) (the "WANE Act"); and
- Nature Conservation (Scotland) Act 2004 (as amended) (the "NCA").

### Guidance

6.3.2 Further key guidance documents relating to the assessment of effects of wind farms on terrestrial (non-avian) ecological receptors that have been referenced in this assessment include the following:

6.3.3 The Scottish Biodiversity List (SBL; Scottish Government, 2013);

6.3.4 The Orkney Local Biodiversity Action Plan 2018 to 2022 (Orkney Local Biodiversity Action Plan Steering Group, 2018);

6.3.5 Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018);

6.3.6 Good Practice during Wind Farm Construction 4th Edition (Scottish Renewables et al., 2019);

6.3.7 Planning for development: What to consider and include in Habitat Management Plans (SNH, 2016); and

6.3.8 Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (SEPA, 2017).

### Planning Policy

6.3.9 The planning chapter of the EIA Report will set out the planning policy framework that is relevant to the EIA process. Of particular relevance to this chapter are:

- National Planning Framework 3 (Scottish Government, 2014);
- Scottish Planning Policy (SPP; Scottish Government, 2019); and
- Shetland Local development Plan 2014 (Shetland Islands Council, 2014).

6.3.10 Planning Advice Note (PAN) 60: Planning for Natural Heritage also provides guidance relevant to this assessment and the Proposed Development.

## 6.4 Proposed Scope of Assessment

### Proposed Study Area

6.4.1 The Study Area for the initial extended Phase 1 survey all ecology surveys will include the Site and a 250 m survey buffer.

### Habitats

6.4.1.1 The Site was subject to a Phase 1 habitat survey in September 2021. The Phase 1 habitat will be followed-up with a targeted NVC survey concentrating on areas of blanket bog and wet heath is scheduled for mid-late April 2022. This will be completed within the Site and a 250m buffer (access permitting).

6.4.1.2 The NVC survey will follow the standard methodology set out in the NVC Users' Handbook (Rodwell 2006) and with reference to the standard descriptions and constancy tables (Rodwell 1991 *et seq*.).

6.4.1.3 Communities will be evaluated in terms of their nature conservation interest and potential groundwater dependence (SEPA 2017).

### Receptors and Impacts Scoped Out of Assessment

6.4.2 **Otter:** Given the lack of suitable habitat for otter holts within 250 m of the Site, and no otter evidence being recorded in the Phase 1 survey, a full otter survey is not proposed.

6.4.3 **Bats**: Due to the limited habitats on Site capable of supporting bats, as well as the exposed nature of the Site and lack of historical bat records, it is considered that the Proposed Development will have a negligible effect on bats.

6.4.4 **Fish Surveys:** Given the absence of major watercourses within the Site, it is considered that dedicated freshwater fish surveys will not be required, but construction should take place under a CEMP to manage the potential for pollution or surface water run-off which may impact the water quality within the loch.

6.4.5 **Orkney Vole:** The drainage channels on Site offer potential to support Orkney vole, which occurs within grassy ditches and grazed pastures. Orkney vole are not specifically protected; however, they are regarded as an endemic sub-species of common vole (*Microtus arvalis*) and are an important prey species for birds of prey (Reynolds, 2002). No further surveys are proposed, but a standard buffer of 10 m from each of the drainage channels within the Site is to be followed to protect the vole population during construction, wherever practicable.

### Other Species Scoped Out

6.4.6 Species which are not known to occur on the Orkney Isles were scoped out of the field survey, such as badger (*Meles meles*), terrestrial reptiles, great crested newt (*Triturus cristatus*) and water vole (*Arvicola amphibius*).

## 6.5 Assessment Methodology

6.5.1 The EcIA will follow the CIEEM (2018) guidelines for Ecological Impact Assessment in the UK and Ireland. The Non-avian Ecology chapter of the EIA Report will define the ecology baseline for the Proposed Development Site and local area, with survey findings analysed and presented (where appropriate) in a technical report. Ecological baseline features will then be evaluated and Important Ecological Features (IEFs) identified.

6.5.2 Activities during the construction, operational and decommissioning phases and their potential significance on vulnerable IEFs will be identified, and an assessment will be made of direct and indirect impacts with consideration of the above guidelines and the geographical scale at which they are significant.

6.5.3 Potential cumulative ecological effects will also be assessed for schemes up to 5 km from the Site boundary.

6.5.4 The assessment will be undertaken in the presence of standard mitigation. Where significant effects are identified, additional mitigation measures may be proposed to reduce effects.

## 6.6 Proposed Mitigation

6.6.1 During the Proposed Development design and EIA process, mitigation measures will seek to follow the recognised hierarchy of avoidance, reduction, enhancement, and compensation. A range of standard mitigation measures will be implemented to reduce any adverse ecological effects including:

- A suitably qualified Ecological Clerk of Works (ECoW) will be appointed prior to the commencement of any construction activities take place. The ECoW will be present and oversee construction activities as well providing toolbox talks to all site personnel with regards to priority species and habitats, as well as undertaking monitoring works and briefings to relevant staff and contractors as appropriate.
- In order to prevent pollution of watercourses within the Site (with particulate matter or other pollutants such as fuel), best practice techniques will be employed.
- Full details of construction mitigation measures will be provided in a CEMP to be agreed with the LPA and stakeholders, i.e. in consultation with NatureScot and SEPA, post-consent but prior to development commencing.

6.6.2 If there is considered to be potential for incorporating biodiversity enhancement measures into the development, then an integrated mitigation and enhancement package will be proposed. This will address ecological effects and will reflect local objectives in terms of biodiversity and the enhancement of environmental character

## 6.7 Potential Impacts

6.7.1 The key ecology and nature conservation issues to be considered with respect to the Proposed Development are likely to include the following:

- disturbance and direct mortality of fauna during construction, operation and decommissioning;
- behavioural changes of fauna during operation;
- pollution via road drainage and runoff during all development phases; and
- habitat loss or desiccation in terms of the possible presence of blanket bog / wet heath or other protected habitat types.

## 6.8 Scoping Questions to Consultees

- Do consultees agree with the receptors and impacts scoped out of the EIA?
- Do consultees agree with the proposed ecological survey scope and methodology?
- Are there any developments or infrastructure schemes which should be taken into account when considering potential cumulative ecological impacts?

# 7. Geology, Peat, Hydrology & Hydrogeology

## 7.1 Introduction

7.1.1 This section considers the potential for significant effects on surface water, groundwater, the potential risk of flooding, and the drainage requirements which may result from the Proposed Development. This section also considers the potential effects on geological receptors, including peat.

## 7.2 Baseline Description

7.2.1 Review of the following publicly available sources has informed the baseline description:

- River Basin Management Plans and Maps;
- SEPA Flood Maps;
- SEPA Reservoir Inundation map;
- British Geological Survey (BGS) Hydrogeology 1:625,000 scale map;
- BGS 1:625,000 and 1:50,000 scale bedrock and superficial deposits map;
- SNH (now Nature Scot) Soil Maps (Carbon and Peatland 2016 map); and
- NatureScot SiteLink.

7.2.2 An initial desk-based review of the baseline conditions for hydrology, geology, hydrogeology and peat characteristics at the Proposed Development is provided below.

### Land Use and Topography

7.2.3 The Site is located between Loch of Swannay to the east, and Loch of Hundland to the west, in the northeast part of the Orkney Mainland (**Figure7.3**). The topography of the Site rises from approximately 50 m above Ordnance Datum (AOD) on the shore of Loch of Swannay at the eastern site boundary, to a high point of 107 m AOD at Hundland Hill in the west of the Site. Hundland Hill is the main topographical feature, with the land sloping down in all directions from that high point.

7.2.4 The Site is mainly agricultural pasture land, with the upper slopes of Hundland Hill and the eastern area nearest Loch of Swannay having more of a moorland character.

### Designated Sites

7.2.5 There are no SACs in or within 1 km of the Site boundary.

7.2.6 There are no geological SSSIs or Geological Conservation Review (GCR) sites in or within 1 km of the Site boundary.

7.2.7 The West Mainland Moorlands SSSI is adjacent to the southeast site boundary (**Figure 7.3**). This is a biological rather than geological SSSI, designated for its assemblage of upland breeding birds. However, it is relevant to note because the heath and bog habitat supporting the bird species may be hydrologically connected to the Proposed Development.

### Geology and Peat

7.2.8 Published geological mapping from the British Geological Survey (BGS) at 1:50,000 scale indicates that much of the Site area has little or no superficial geology, i.e. bedrock is anticipated to be at the surface or overlain by thin soils (**Figure 7.1**). The north-central and eastern parts of the Site are

indicated to have peat deposits overlying bedrock, with more extensive peat recorded off-site to the southeast. Till deposits (typically a clay matrix with variable sand, gravel, cobbles and boulders) are recorded in the far south of the Site. An area of alluvial deposits (clay, silt, sand and gravel), is located at the far northwest edge of the Site, extending to the northwest along the low ground north of Loch of Hundland.

7.2.9 The SNH Carbon and Peatlands Map 2016 shows does not identify any Class 1 or Class 2 peat (both classifications considered to be nationally important) within the Site boundary, with the exception of the furthest southeast corner (**Figure 7.2**). Most of the Site area is classified as Class 4 (unlikely associated with peatland habitats, unlikely to include carbon-rich soils) and the western site area is identified as being underlain by mineral soils.

7.2.10 Bedrock is indicated on BGS mapping to comprise the Stromness Flagstone Formation (siltstone, mudstone and sandstone) across the entire site (**Figure 7.1**).

### Surface Water

7.2.11 The two lochs noted above have an overall water quality of 'Good' based on SEPA's online water classification hub. Apart from the two lochs, there are no major surface water features on the Site or within 1 km of the Site boundary. There are a number of minor field drains in the vicinity, including two in the northwest part of the Site and one flowing into Loch of Swannay in the east.

7.2.12 Drainage from the entire site area is anticipated to be to Loch of Swannay and Loch of Hundland, either shedding directly from the slopes or entering field drains which flow into the lochs. Both lochs ultimately drain to the sea on the north shore of the Orkney Mainland.

### Groundwater

7.2.13 The sedimentary bedrock underlying the Site is identified as a moderately permeable aquifer, in which flow is virtually all through fractures and other discontinuities. The Site area is situated within the Orkney groundwater body (ID 150678), classified by SEPA as having an overall status of 'Good'.

7.2.14 A well is marked on OS mapping, within the Site near the northwest boundary. Another well is marked on OS mapping approximately 60 m north of the central part of the Site. It is not yet known whether these wells are in active use, and for what purpose.

7.2.15 There are a number of rural residential properties within the study area. There is potential for these to be served by private water supplies (PWS), although it is noted that the area is covered by Scottish Water's online water quality mapping, suggesting that the properties may all be served by mains water. This will be determined during the EIA process, to establish whether there are PWS in the study area which require assessment.

### Flooding

7.2.16 A review of SEPA's online flood mapping indicates that no areas of the Site are expected to be at risk of river, coastal, or surface water flooding. The 'future flood maps' similarly do not show any anticipated flood risk affecting the Site, by the 2080s.

## 7.3 Guidance and Legislation

7.3.1 The key sources of guidance and legislation relating to geology, peat, hydrology and hydrogeology are outlined below. Planning policies of relevance to this assessment are provided in Section 3: Planning and Energy Policy Context.

7.3.2 The following national legislation and policy advice will be consulted as part of the assessment:

- The Water Environment (Controlled Activities) (Scotland) Regulations 2011;
- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017; and

- The Water Environment and Water Services (Scotland) Act 2003.

7.3.3 The following guidance documents will be consulted as part of the assessment:

- SEPA Policy 19 Groundwater Protection Policy for Scotland (Version 3, 2009);
- SEPA Policy 41 A Planning Authority Protocol Development at Risk of Flooding: Advice and Consultation (2016);
- CIRIA C532: Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors (2001);
- Scottish Government, SNH, SEPA Guidance on Developments on Peatland (2017);
- Scottish Renewables and SEPA Developments on peatland: Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste (2014);
- Scottish Government Proposed electricity generation developments: peat landslide hazard best practice guide (2017);
- SEPA LUPS GU 4 Planning advice on wind farm developments (2017);
- SEPA LUPS GU 31 Planning Guidance on Groundwater Abstractions and GWDTE (2017);
- NetRegs Guidance for Pollution Prevention (GPP) (Various); and
- Scottish Renewables, Scottish Natural Heritage, SEPA, Forestry Commission Scotland and Historic Scotland Good practice during wind farm construction, 4th edition (2019).

## 7.4 Study Area

7.4.1 The proposed Study Area for assessment of effects on geological resources is the Site boundary itself.

7.4.2 The proposed study area for assessment of hydrological and hydrogeological effects is a 1 km buffer around the Site area of the Proposed Development

## 7.5 Assessment Methodology

### Desk-Based Assessment

7.5.1 A desk-based assessment will be carried out in order to establish the catchment characteristics and baseline geological and hydrogeological conditions beneath the Site. The desk-based review of baseline information will comprise:

- The determination of site geology and hydrogeology from maps published by the BGS (expanding, as appropriate, on the information presented in this Scoping Report), and any site investigation reports that may be available, including any previous peat surveys at or in close proximity to the Site;
- A review of existing sources of data relating to the water regime, including SEPA water quality and flood risk data, discharge consents, abstraction licenses and identification of other water users;
- A review of risk to potential PWSs, through consultation with OIC and SEPA, and review of Scottish Water plans as appropriate, to establish the presence and use of PWS (with further information to be gathered as part of the Site-based assessment as outlined below);
- Consideration of any potentially contaminative current or historical land uses, although considered unlikely;
- A review of the development proposals and reports from other technical studies being undertaken for the planning application, including ecology surveys, drainage strategy and flood risk assessment; and

- Liaison with the project ecologists and review of survey data (including NVC) to identify potential GWDTE.

### Site-Based Assessment

7.5.2 A visual survey of watercourses/drains and water bodies will also be undertaken to record key features, characteristics and potential localised flood risk sources. If applicable, potential locations where watercourses will require to be crossed by construction traffic and site tracks will be identified to inform the watercourse crossing design/schedule.

7.5.3 Any identified habitats considered to potentially be GWDTE, based on the NVC survey data, will be visited and inspected to help determine actual groundwater dependence.

7.5.4 If known or potential PWS are identified from the desk study work, then these will be visited and questionnaires provided to the PWS users, to establish the nature, source, usage and other characteristics and inform assessment of potential effects.

7.5.5 Peat surveys will be undertaken across the Proposed Development site in accordance with Scottish Government, formerly Scottish Natural Heritage and SEPA: 'Peatland Survey Guidance on Development' to determine its extent. A Stage 1 peat survey will comprise probing on a 100 m x 100 m matrix across the site. The findings will be used to guide design iteration, seeking to avoid siting turbines and infrastructure on deep peat wherever possible.

7.5.6 Depending on the findings of the Stage 1 peat survey and the proposed design layout, Stage 2 surveys will be undertaken to specifically target the proposed locations of turbine bases, crane hardstanding, track routes, and other infrastructure such as the Site substation and, if applicable, borrow pit(s). Findings from the Stage 2 survey will be used to refine the project design and to inform restoration plans and peat management measures.

### Assessment of Effects

7.5.7 Potential effects will be assessed based on the sensitivity of identified receptors, and the magnitude of potential impacts arising from the construction, operation and decommissioning of the Proposed Development. Clear criteria for the determination of receptor sensitivity and impact magnitude will be set out in the EIA Report, together with criteria for determining the resultant significance of effect.

## 7.6 Proposed Mitigation

7.6.1 Following the assessment of effects, required mitigation measures will be identified and any subsequent residual effects will be assessed. Specific reference will be made to the SEPA Guidance Note 4 'Planning guidance on wind farm developments' (LUPS-GU4) (2017) and SEPA 'Guidelines for Water Pollution Prevention from Civil Engineering Contracts: Special Requirements' (2006).

7.6.2 Most or all potentially significant effects are anticipated to be mitigable through standard, embedded mitigation measures including suitable site design (taking the findings of the above studies and surveys into account) and appropriate construction methods to be set out in a Construction Environmental Management Plan (CEMP). Where additional, site-specific mitigation is required, this will be clearly set out in the EIA Report and will be the subject of ongoing consultation with relevant regulators and stakeholders.

## 7.7 Potential Impacts

7.7.1 The potential impacts associated with construction and operation of the Proposed Development are detailed below:

- Pollution or siltation of local watercourse/lochs from construction-phase run-off;

- Changes to surface water drainage patterns, for example introduction of areas of hardstanding and crossings of minor field drains;
- Impacts on the quality and/or quantity of groundwater serving local PWS and GWDTE, if present;
- Excavation, localised compaction and/or dewatering of peat; and
- Impacts on environmental and human receptors from peat slide risk.

7.7.2 The above impacts will be assessed to determine potential magnitude, to establish the potential significance of effect. As noted above, it is considered likely that significant effects can be avoided through standard embedded mitigation, including appropriate site design.

## 7.8 Receptors and Impacts Scoped In or Out of Assessment

*Table 7.1 Geology, Hydrology and Hydrogeology Receptors and Impacts*

| Receptor | Scoped In? | Notes |
|---|---|---|
| Designated sites | Yes | Adjacent SSSI which may be hydrologically connected to the Site. |
| Surface water | Yes | Loch of Swannay and Loch of Hundland adjacent/in close proximity to the Site and likely to receive all site surface drainage. |
| Flood risk | No | No potential flood risk identified on or in close proximity to the Site. Crossings of minor watercourses/ field drains, if required, will be designed to appropriately convey flows. |
| PWS | Yes | Wells marked on OS mapping, potential for PWS to be present, therefore provisionally scoped in. May be scoped out in consultation with SEPA and OIC if studies identify no PWS within the Site catchment area. |
| GWDTE | Yes | Moderately permeable aquifer, potential for GWDTE to be present, therefore provisionally scoped in. May be scoped out in consultation with SEPA and OIC if surveys identify no GWDTE within relevant buffer distances of proposed infrastructure. |
| Peat | Yes | Geological mapping indicates the potential presence of peat at the Site, the extent, depth and nature of which will be established during the EIA process. There is potential for at least some excavation of peat to be required, and potential for the Proposed Development to impact on peat via localised compaction and dewatering. |
| Receptors sensitive to peat slide risk (watercourses/ water bodies, properties, infrastructure) | Yes | Depending on the findings of peat survey work, provisionally scoped in. May be scoped out in consultation with SEPA and OIC if peat surveys identify little or no peat at proposed infrastructure locations. |
| Bedrock geology | No | Low sensitivity receptor with no potential for significant effects from construction, operation or decommissioning. |

| Receptor | Scoped In? | Notes |
|---|---|---|
| Contaminated land | No | Low likelihood of any current or historical contaminative land uses at the Site; Proposed Development not a sensitive receptor to contamination. |

## 7.9 Scoping Questions to Consultees

- Do the consultees agree that, subject to further information coming to light from the field surveys, consultation and desk study, the scope of the assessment is appropriate?
- Do the consultees have any information not outlined in the Scoping report that would inform the impact assessment for geology, peat, hydrology and hydrogeology?

# 8. Noise

## 8.1 Introduction

8.1.1 This chapter considers the potentially significant effects of noise during the Site preparation and construction, operation and decommissioning of the Proposed Development which will require further consideration within the EIA Report.

8.1.2 This Scoping chapter sets out the key issues identified and proposes methodology and standards for assessment in the EIA Report.

8.1.3 Initial consultation has been undertaken with OIC Environmental Health Officer (EHO) to agree the approach to the baseline survey and monitoring locations. Consultation will continue throughout the assessment to agree representative Noise Sensitive Receptors (NSRs), derive appropriate noise limits and agree a method for the consideration of potential cumulative effects.

## 8.2 Baseline Description

8.2.1 A review of maps and aerial images has identified that the Site and surroundings comprise a mixture of farmland, moorland and open water lochs with scattered farms and houses. We note at least one existing wind turbine.

8.2.2 From our knowledge of Orkney gained during previous baseline monitoring campaigns we expect that background noise levels will be comparatively low and mostly unaffected by anthropogenic noise. The noise environment is likely to be dominated by the wind, wildlife and livestock.

## 8.3 Guidance and Legislation

8.3.1 The following documents will be referenced in the EIA Report chapter:

- The Control of Pollution Act (CoPA) 1974;
- Planning Advice Note (PAN) 1/2011: Planning and Noise;
- The Working Group on Noise from Wind Turbines The Assessment & Rating of Noise from Wind Farms (ETSU-R-97) (1996);
- Institute of Acoustics (IoA) Bulletin Article Volume 34 No. 2, March / April 2009;
- Institute of Acoustics (IoA) (2013) A good practice guide to the application of ETSU-R-97 for wind turbine noise assessment (IoA GPG) and associated Supplementary Guidance Notes (SGS); and
- British Standard (BS) 5228 (2009) Part 1: Noise + A1 (2014) Code of practice for noise and vibration control on construction and open sites.

8.3.2 Where OIC has its own noise-related requirements, these will also be taken into account in the EIA Report chapter. We would request that any such requirements should be highlighted in the Scoping response, however based on our experience we understand OIC conforms to guidance provided in ETSU-R-97 and the IoA Good Practice Guide.

## 8.4 Study Area

8.4.1 The Study Area has been informed by preliminary modelling of the Proposed Development. The 35 $dBL_{A90}$ noise contour is shown in **Figure 8.1**, for operation in isolation. NSRs will be agreed with the OIC EHO following a review of maps of the area and a site visit to identify residential properties.

## 8.5 Assessment Methodology

### Construction

8.5.1 Potential impacts from construction noise and, where appropriate, vibration, will be assessed at the closest identified NSRs. Predictions of noise and vibration will be based on the likely site preparation and construction methods and programme. Where appropriate, the assessment of construction noise and vibration will also consider off-site activities such as construction traffic and deliveries, where the necessary information is available.

### Operation

8.5.2 Further consultation with the OIC EHO to agree the detailed method of assessment will be undertaken, however the general approach is outlined below.

8.5.3 The identity of the closest NSRs will be agreed and any financial involvement established. Any relevant wind energy schemes that should be included in the cumulative assessment, whether in planning, consented or operational, will also be identified and agreed. We anticipate that this may include the operational on-site turbine(s), other local single turbine developments and more distant developments at Costa Head. Potentially cumulative developments will be excluded on the basis of a 10 dB difference in noise emissions at relevant NSRs, where this can be demonstrated through prediction. We further note that existing on-site turbines may be removed prior to construction of the Proposed Development and could be excluded from the cumulative assessment on this basis.

8.5.4 The baseline noise survey will be undertaken in accordance with the IoA GPG. Wind speed measurements will be collected using a SoDAR device and standardised to 10 m in accordance with the method provided in the GPG. Micro-siting of the baseline survey locations will seek to exclude influence from non-representative noise sources such as plant, boiler flues, heat pumps, vegetation and existing turbines. A record of the installation of monitoring locations will be provided to the OIC EHO for review following the commissioning visit.

8.5.5 Day and night-time operational noise limits across the range of critical wind speeds (typically 4 – 12 m/s) will be established at the closest identified NSRs in accordance with ETSU-R-97 and any specific requirements of OIC. A record of the data analysis will be provided to the OIC EHO, identifying periods of rainfall excluded from the analysis and any other treatments of the data.

8.5.6 Following the baseline survey, noise limits will be applied at NSRs using monitoring locations as proxies. The approach to allocating proxy data to NSRs will be agreed with the OIC EHO.

8.5.7 A candidate turbine will be selected for the Proposed Development, the verified noise emission details of which will be reproduced in the EIA Report chapter (A-weighted and octave band data) for critical wind speeds.

8.5.8 Noise levels will be predicted within CadnaA noise modelling software, in accordance with the ISO9613 method and the IoA GPG requirements. Appropriate corrections for concave topography and line-of-sight visibility will be applied to predicted noise levels in accordance with the IoA GPG requirements, if applicable. Where NSRs lie across significant water bodies from the turbines an appropriate method of prediction for propagation over water will be applied, in accordance with the IoA GPG.

8.5.9 Corrections for directivity may be applied within the cumulative assessment in accordance with the guidance set out in the IoA GPG where NSRs lie between two developments and where simultaneous down-wind predictions are therefore overly conservative.

8.5.10 Predicted levels will be evaluated against proposed noise limits and the magnitude of impact and significance of effect determined accordingly. All residential NSRs will be assumed to be of high sensitivity. The sensitivity of any other types of receptor identified will be agreed with the OIC EHO.

## 8.6 Proposed Mitigation

8.6.1 We anticipate that key controls for construction noise such as core hours of works would be exerted through the requirements of the OIC EHO and that such controls would constitute effective mitigation measures.

8.6.2 Site-specific mitigation measures will be outlined to reflect the principles of Best Practicable Means, as set out in the Control of Pollution Act (CoPA) 1974. The purpose of these measures will be to reduce construction noise and, where relevant, vibration impacts insofar as is reasonably practicable.

8.6.3 Where predicted noise levels exceed the proposed noise limits at any wind speed, outline mitigation strategies will be proposed. Mitigation of operational noise, if required, may include an alternative selection of turbine, operating certain turbines in low noise modes under certain meteorological conditions, such as specific wind speeds and directions, or recommendations to move or eliminate turbines from the scheme.

## 8.7 Potential Impacts

8.7.1 The Proposed Development will introduce new noise sources into the area, both during the construction and operational phases. Significant adverse impacts can be prevented by ensuring noise levels due to the Proposed Development meet noise limits determined in accordance with appropriate guidance, as detailed above.

## 8.8 Receptors and Impacts Scoped In or Out of Assessment

8.8.1 No NSRs have yet been scoped out of the assessment, however, the status of potential NSRs will be confirmed during site visits and through consultation with OIC. Where properties are determined to be derelict and uninhabitable, they may be scoped out of further assessment.

8.8.2 Should any blasting be required for borrow pits, it is unlikely that the charge parameters will be known at the time of the assessment. We therefore propose to scope out detailed assessment of potential vibration impacts, and instead commit to meeting appropriate vibration limits at NSRs should blasting be required. We anticipate that such a commitment could be agreed through an appropriate planning condition.

## 8.9 Scoping Questions to Consultees

- Are the proposed assessment methods and proposed study areas accepted?

# 9. Cultural Heritage

## 9.1 Introduction

9.1.1 This Chapter of the EIA Scoping Report outlines the baseline archaeological and cultural heritage conditions at the Site and outlines the methodology that will be utilised for the identification and assessment of effect on heritage assets within the EIA Report. This chapter also considers the potential for significant effects on heritage assets arising from the Proposed Development and highlights instances where mitigation measures may be required.

9.1.2 This chapter of the EIA Scoping Report has been produced by AOC Archaeology Group, a Registered Organisation of the Chartered Institute for Archaeologists (CIfA).

## 9.2 Baseline Description

9.2.1 The Historic Landuse Assessment (Historic Environment Scotland) indicates that the western portion of the site was rectilinear fields and farms and the eastern portion of the site was rough grazing. Historic map evidence indicates that the site was undeveloped, predominantly consisting of rough grazing until the construction of the small turbine on site.

9.2.2 There are three Scheduled Monuments within the Proposed Development or clipped by the Proposed Development boundary. There are no other assets; designated or non-designated within the Proposed Development boundary.

9.2.3 There are 14 non-designated heritage assets within 1km of the Proposed Development (Appendix 9.1; **Figure 9.1**)

9.2.4 Four Scheduled Monuments are located within 1km of the Proposed Development, 42 Scheduled Monuments are located within 5km of the Proposed Development (**Figure 9.2**) and a further 71 Scheduled Monuments are located within 10km of the Proposed Development.

9.2.5 No Listed Buildings are located within the Proposed Development boundary or within 1km of the Proposed Development. Eleven Listed Buildings of Category B and C status are located within 5km of the Proposed Development; there are no Category A Listed Buildings located within 5km of the Proposed Development. Three Listed Buildings of Category A status are located within 10km of the Proposed Development.

9.2.6 Eynhallow Conservation Area is located within the 5km Study Area.

9.2.7 The Proposed Development is located within the Heart of Neolithic Orkney World Heritage Site (HONO WHS) Sensitive Area. The HONO WHS buffer is located 6.6km from the Proposed Development boundary and is the buffer around the Skara Brae element of the WHS. The nearest element of the HONO WHS is located 10.5km from the Proposed Development boundary.

9.2.8 There are no Inventoried Gardens and Designed Landscapes within 5km and no Inventoried Battlefields within 10km of the Proposed Development.

## 9.3 Guidance and Legislation

9.3.1 The EIA Report will be prepared in accordance with relevant national and local legislation, policy, and guidance on the historic environment:

### Legislation

- The Ancient Monuments and Archaeological Areas Act 1979 (as amended).
- The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 (as amended).

- The Planning etc. (Scotland) Act 2006.
- Historic Environment (Amendment) (Scotland) Act 2011.
- Historic Environment (Scotland) Act 2014.
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended).

### Policy

- Scottish Planning Policy (Scottish Government 2014).
- Historic Environment Policy for Scotland (HES 2019a), including Designation Policy and Selection Guidance (HES 2019b).
- Our Place in Time. The Historic Environment Strategy for Scotland (Scottish Government, 2014)
- The adopted Orkney Local Development Plan (Orkney Islands Council (OIC), 2017a).

### Guidance

- Planning Advice Notes (PAN) for Scotland in particular PAN 2/2011 'Archaeology and Planning' (Scottish Government 2011).
- Managing Change in the Historic Environment: Setting (HES 2020).
- NatureScot & HES's published guidance contained within 'Environmental Impact Assessment Handbook v5' (SNH & HES 2018).
- Chartered Institute for Archaeologists (CIfA) Code of Conduct (2014- Updated 2020).
- CIfA Standard and guidance for commissioning work or providing advice on archaeology and the historic environment (2014).
- CIfA Standard and guidance for historic environment desk-based assessment (2014)

## 9.4 Study Area

9.4.1 In order to assess the potential for significant effects on cultural heritage assets resulting from the Proposed Development, the following Study Areas have been identified:

- A core study area (the site) which includes all land within the site boundary which will be subject to assessment for potential direct effects. This study area will be subject to detailed walkover survey and will be used to identify cultural heritage assets which may be directly affected by the Proposed Development.
- A 1 km study area for the identification of all known heritage assets and known previous archaeological interventions in order to help predict whether any similar hitherto unknown archaeological remains are likely to survive within the site and thus be impacted by the Proposed Development.
- A 5 km study area for the assessment of potential effects on the settings of all designated heritage assets including Scheduled Monuments; all Listed Buildings; Inventoried Gardens and Designed Landscapes and Conservation Areas.
- A 10 km study area for the assessment of potential effects on the settings of all nationally important designated heritage assets including Scheduled Monuments; Category A Listed Buildings; and Inventoried Gardens and Designed Landscapes.
- A 15 km study area for the assessment of potentially effects on the settings of the internationally important HONO WHS.

## 9.5 Assessment Methodology

9.5.1 The assessment will establish the historic environment baseline for the site. Baseline data will be collated from the following sources:

- Historic Environment Scotland (HES) for:
  - National Record of Historic Environment (NRHE) Data;
  - Designated asset data; and
  - Published and unpublished archaeological reports.
- National Library for Scotland for:
  - Ordnance Survey maps and pre-Ordnance Survey historical maps
- Orkney Archives & Museum Service for:
  - Historical maps, plans and documents relating to past land use.
- National Collection of Aerial Photography (NCAP), held by HES, for:
  - Historic aerial photographs.
- Scottish Remote Sensing Portal for:
  - LiDAR data
- Walkover Survey:
  - A detailed walkover survey will be undertaken across the entirety of the Site in order to identify any hitherto unrecorded upstanding or earthwork remains which may survive.
- Setting assessment site visits
  - A visit to designated assets with potential to be impacted by the Proposed Development to establish their current settings

9.5.2 The EIA Report chapter will fully describe the baseline historic environment conditions and will assess the potential for direct impacts upon known heritage assets within the site and will outline the potential for hitherto unknown buried remains to survive on site, and thus potentially be impacted upon. The assessment will also consider the identified heritage assets in the area surrounding the Proposed Development which could be subject to potential impacts upon setting, including the potential for cumulative impacts from the Cumulative Developments outlined in Section 2.3. The EIA Report chapter will be supported by a detailed ZTV which will be used to identify assets intervisible with the Proposed Development and/or where the Proposed Development would appear in key views to and from assets. It is envisaged that visualisations (either wireframes or photomontages) will be produced for some assets to aid in assessment of settings impacts. The viewpoints required will be agreed in consultation with HES, The Orkney Regional Archaeologist and the project's LVIA consultants.

9.5.3 The assessment will distinguish between the term 'impact' and 'effect'. An impact is defined as a physical change to a heritage asset or its setting, whereas an effect refers to the significance of this impact. The first stage of the assessment will involve establishing the importance of the heritage asset and assessing the sensitivity of the asset to change (impact). Using the proposed design for the Proposed Development, an assessment of the impact magnitude will be made and a judgement regarding the level and significance of effect will be arrived at.

9.5.4 The rating of importance of heritage assets will first and foremost be made in reference to their designation. For non-designated assets importance will be assigned based on professional judgement and guided by the criteria presented in **Table 9.1** Criteria for Establishing Importance of Heritage Assets; which itself relates to the criteria for designations as set out in Designation Policy and Selection Guidance (HES 2019b) and Scotland's Listed Buildings (HES 2019c).

*Table 9.1 Criteria for Establishing Importance of Heritage Assets*

| Importance | Receptors |
|---|---|
| Very High | World Heritage Sites;<br>Other designated or non-designated heritage assets with demonstrable Outstanding Universal Value. |
| High | Scheduled Monuments (as protected by the Ancient Monuments and Archaeological Areas Act 1979 (the "1979 Act");<br>Category A Listed Buildings (as protected by the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997) (the "1997 Act");<br>Inventory Gardens and Designed Landscapes (as protected by the 1979 Act, as amended by the Historic Environment (Amendment) (Scotland) Act 2011);<br>Inventory Battlefields (as protected by the 1979 Act, as amended by the 2011 Act);<br>Outstanding examples of some period, style or type;<br>Non-designated heritage assets considered to meet the criteria for the designations as set out above; (as protected by SPP, 2014). |
| Medium | Category B and C Listed Buildings (as protected by the 1997 Act);<br>Conservation Areas;<br>Major or representative examples of some period, style or type; or<br>Non-designated assets considered to meet the criteria for the designations as set out above (as protected by SPP, 2014). |
| Low | Locally Listed assets;<br>Examples of any period, style or type which contribute to our understanding of the historic environment at the local level. |
| Negligible | Relatively numerous types of features;<br>Findspots of artefacts that have no definite archaeological remains known in their context;<br>The above non-designated heritage assets are protected by Paragraph 137 of SPP, 2014). |

9.5.5 Determining cultural heritage significance can be made with reference to the intrinsic, contextual and associative characteristics of an asset and/or feature as set out in HEPS (HES 2019a) and its accompanying Designation Policy and Selection Guidance (HES 2019b). HEPS Designation Policy and Selection Guidance (2019b) indicates that the relationship of an asset to its setting or the landscape makes up part of its contextual characteristics. While SPP does not differentiate between the importance of the asset itself and the importance of the asset's setting, HES's Managing Change Guidance, in defining what factors need to be considered in assessing the impact of a change on the setting of a historic asset or place states that the magnitude of the proposed change should be considered "relative to the sensitivity of the setting of an asset" (HES 2020, 11) thereby making clear that assets vary in their sensitivity to changes in setting and thus have a relative sensitivity. The EIA Handbook suggests that cultural significance aligns with sensitivity but also states that "the relationship between value and sensitivity should be clearly articulated in the assessment" (HES and SNH 2018, 184). It is therefore recognised (ibid;) that the importance of an asset is not the same as its sensitivity to changes to its setting. Elements of setting may make a positive, neutral or negative contribution to the significance of an asset. Thus, in determining the nature and level of effects upon assets and their settings by the development, the contribution that setting makes to an asset's significance and thus its sensitivity to changes to setting will be considered.

9.5.6 The criteria that will be used for establishing an asset's relative sensitivity to changes to its setting is detailed in **Table 9.2** Criteria for Establishing Relative Sensitivity of a Heritage Asset to Changes to its Setting. This table has been developed based on AOC's professional judgement and experience in assessing setting effects. It has been developed with reference to the policy and guidance noted above including SPP (Scottish Government 2014), HEPS (HES 2019a) and its Designation Policy and Selection Guidance (HES 2019b), the Xi'an Declaration (ICOMOS 2005), the EIA Handbook (SNH & HES 2018) and HES's guidance on the setting of heritage assets (HES 2020).

***Table 9.2 Criteria for Establishing Relative Sensitivity of a Heritage Asset to Changes to its Setting***

| Relative Sensitivity | Criteria |
|---|---|
| Very High | An asset, the setting of which, is critical to an understanding, appreciation and experience of it should be thought of as having Very High Sensitivity to changes to its setting. This is particularly relevant for assets whose settings, or elements thereof, make an essential direct contribution to their cultural significance (e.g. form part of their Contextual Characteristics (HES, 2019b, Annex 1). |
| High | An asset, the setting, of which, makes a major contribution to an understanding, appreciation and experience of it should be thought of as having High Sensitivity to changes to its setting. This is particularly relevant for assets whose settings, or elements thereof, contribute directly to their cultural significance (e.g. form part of their Contextual Characteristics (HES, 2019b, Annex 1). |
| Medium | An asset, the setting of which, makes a moderate contribution to an understanding, appreciation and experience of it should be thought of as having Medium Sensitivity to changes to its setting. This could be an asset for which setting makes a contribution to significance but whereby its value is derived mainly from its other characteristics (HES 2019b). |
| Low | An asset, the setting of which, makes some contribution to an understanding, appreciation and experience of it should generally be thought of as having Low Sensitivity to changes to its setting. This may be an asset whose value is predominantly derived from its other characteristics |
| Marginal | An asset whose setting makes minimal contribution to an observer's understanding, appreciation and experience of it should generally be thought of as having Marginal Sensitivity to changes to its setting. |

9.5.7 The determination of a heritage asset's relative sensitivity to changes to its setting is first and foremost reliant upon the determination of its setting and the key characteristics of setting which contribute to its cultural significance and an understanding and appreciation of that cultural significance. This aligns with Stage 2 of the HES guidance on setting (2020, 9). The criteria set out in **Table 9.2** Criteria for Establishing Relative Sensitivity of a Heritage Asset to Changes to its Setting are intended as a guide. Assessment of individual heritage assets will be informed by knowledge of the asset itself; of the asset type if applicable and by site visits to establish the current setting of the assets. This will allow for the use of professional judgement and each asset is assessed on an individual basis unless otherwise indicated.

9.5.8 Potential impacts, that is the physical change to known heritage assets, and unknown buried archaeological remains, or changes to their settings, in the case of the Proposed Development relate to the possibility of disturbing, removing or destroying in situ remains and artefacts during the construction phase or the placement of new features within their setting during the operational phase.

9.5.9 The magnitude of the impacts upon heritage assets caused by the Proposed Development will be rated using the classifications and criteria outlined in **Table 9.3** Criteria for Classifying Magnitude of change.

***Table 9.3 Criteria for Classifying Magnitude of change***

| Magnitude of change | Criteria |
|---|---|
| High | Substantial loss of information content resulting from total or large-scale removal of deposits from an asset;<br>Major alteration of an asset's baseline setting, which materially compromises the ability to understand, appreciate and/or experience the contribution that setting makes to the significance of the asset and erodes the key characteristics (HES 2020) of the setting. |
| Medium | Loss of information content resulting from material alteration of the baseline conditions by removal of part of an asset;<br>Alteration of an asset's baseline setting that effects the ability to understand, appreciate and/or experience the contribution that setting makes to the significance of the asset to a degree but whereby the cultural significance of the monument in its current setting remains legible. The key characteristics of the setting (HES 2020) are not eroded. |
| Low | Detectable impacts leading to minor loss of information content.<br>Alterations to the assets baseline setting, which do not affect the ability to understand, appreciate and/or experience the contribution that setting makes to the asset's overall significance. |
| Negligible | Loss of a small percentage of the area of an asset's peripheral deposits;<br>A reversible alteration to the fabric of the asset;<br>A marginal alteration to the asset's baseline setting. |
| None | No effect predicted |

9.5.10 The predicted level of effect on each heritage asset will be determined by considering the asset's importance in conjunction with the predicted magnitude of the impact. The method of deriving the level of effect is provided in **Table 9.4** Level of Effects based on Inter-Relationship between the Sensitivity of a Heritage Asset and/or its setting and the Magnitude of Impact.

***Table 9.4 Level of Effects based on Inter-Relationship between the Sensitivity of a Heritage Asset and/or its setting and the Magnitude of Impact***

| Magnitude of Impact | Sensitivity | | | | |
|---|---|---|---|---|---|
| | **Negligible** | **Low** | **Medium** | **High** | **Very High** |
| **High** | Minor | Moderate | Moderate | Major | Major |
| **Medium** | Negligible/ Neutral | Minor | Moderate | Moderate | Major |
| **Low** | Negligible/ Neutral | Negligible/ Neutral | Minor | Minor | Moderate |
| **Negligible** | Negligible/ Neutral | Negligible/ Neutral | Negligible/ Neutral | Minor | Minor |

9.5.11 The level of effect is judged to be the interaction of the asset's importance and/or relative sensitivity (**Table 9.1** Criteria for Establishing Importance of Heritage Assets and/or**Table** 9.2 Criteria for Establishing Relative Sensitivity of a Heritage Asset to Changes to its Setting) and the magnitude of the impact (**Table 9.3** Criteria for Classifying Magnitude of change). In order to provide a level of consistency, the assessment of importance and relative sensitivity, the prediction of magnitude of impact and the assessment of level of effect will be guided by pre-defined criteria. However, a qualitative descriptive narrative will also be provided for each asset to summarise and explain each of the professional value judgements that have been made in establishing sensitivity and magnitude of impact for each individual asset.

9.5.12 Using professional judgment and with reference to the Guidelines for Environmental Impact Assessment (as updated) (IEMA 2017), and the EIA Handbook (2018) the assessment will consider moderate and greater effects to be significant (shaded grey in **Table 9.4** Level of Effects based on Inter-Relationship between the Sensitivity of a Heritage Asset and/or its setting and the Magnitude of Impact), while minor and lesser effects will be considered not significant.

9.5.13 SPP notes that where there is potential for a proposed development to have an adverse effect on a Scheduled Monument or on the integrity of its setting, permission should only be granted where there are 'exceptional circumstances'. Adverse effects on integrity of setting are judged here to relate to whether a change would adversely affect those attributes or elements of setting which contribute to an asset's significance to the extent that the ability to understand and appreciate the asset is diminished.

9.5.14 In terms of effects upon the setting of heritage assets, it is considered that only those effects identified as 'significant' in the assessment will have the potential to adversely affect integrity of setting. Where no significant effect is found it is considered that the integrity of an asset's setting will remain intact. This is because for many assets, setting may make a limited contribution to their significance and as such changes would not affect integrity of their settings. Additionally, as set out in **Table 9.3** Criteria for Classifying Magnitude of change, lower ratings of magnitude of change relate to changes that would not obscure or erode key characteristics of setting.

9.5.15 Where significant effects are found, a detailed assessment of adverse effects upon integrity of setting will be made. Whilst non-significant effects are unlikely to affect integrity of setting, the reverse is not always true. That is, the assessment of an effect as being 'significant' in EIA terms does not necessarily mean that the effect to the asset's setting will harm its integrity. The assessment of adverse effect upon the integrity of an asset's setting, where required, will be a qualitative one, and will largely depend upon whether the effect predicted would result in a major impediment to the ability to understand or appreciate the heritage asset and therefore reduce its cultural significance.

9.5.16 The assessment of cumulative effects on heritage assets will be based upon consideration of the effects of the Proposed Development on the settings of designated heritages assets within the 5km, 10 km and 15 km study areas, in addition to the likely effects of other operational/under construction, consented and proposed (at the application and scoping stages) wind farm schemes.

9.5.17 The assessment will take into account the relative scale (i.e. size and number of turbines) of the identified developments, their distance from the affected assets, and the potential degree of visibility of the various developments from the assets. Cumulative wirelines from those assets most likely to experience significant cumulative impacts on their settings will be provided.

9.5.18 The schemes to be included in the cumulative impact assessment will be those identified through the proposed consultations with the Orkney Islands Council and NatureScot and will be undertaken according to the guidance in Historic Environment Scotland's Environmental Impact Assessment Handbook (HES & SNH 2018).

## 9.6 Field Survey and Setting Assessment Survey

9.6.1 An archaeological walkover survey of the Site will be undertaken with the aim of identifying any previously unknown archaeological features. All known and accessible heritage assets will be assessed in the field to establish their survival, extent, significance and relationship to other sites. Weather and any other conditions affecting the visibility during the survey will also be recorded. All heritage assets encountered will be recorded and photographed. The location of features noted in the field will be recorded using ArcGIS Surveyor and cross-referenced with hand-held GPS and mapping to record and confirm the position of each feature and to record the route of the survey. All features will be recorded directly through ArcGIS Collector in full British National Grid coordinates.

9.6.2 All designated assets within 5km of the Site that fall within the ZTV will be subjected to visits by staff from AOC Archaeology in order to undertake a setting assessment. All nationally important designated assets between 5km and 10km of the Site that fall within the ZTV will also be subjected to visits by staff from AOC Archaeology in order to undertake a setting assessment. The HONO WHS within 15km of the Site will be subject to visits by staff from AOC Archaeology in order to undertake a setting assessment.

9.6.3 An assessment will also be undertaken of the St Magnus Way pilgrimage route through Mainland Orkney, inspired by the life and death of Magnus, Orkney's patron saint. This will involve review of the extent to which the Proposed Development would be visible along the route as well as visits to key points along the route to assess potential impacts.

9.6.4 Due to the connection that has formed between Orkney and the loss of the Secretary of State for War, Earl Kitchener and the 1st class armoured cruiser HMS *Hampshire* off of Marwick Head on the 5th of June 1916 during the First World War; the Category C listed Kitchener Memorial will also be included in the setting assessment; this asset is located 7km from the Site.

## 9.7 Proposed Mitigation

9.7.1 National planning policies and planning guidance as well as the local planning policies 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 these policies require that any significant effects are minimised or offset.

9.7.2 The Proposed Development will be designed to avoid direct impacts on known heritage features.

9.7.3 Given the presence of known heritage features and the potential for presently unknown archaeological remains to be buried beneath peat on the Site, a programme of archaeological works will be undertaken prior to the commencement of construction of the Proposed Development. Details of the proposed programme of archaeological works will be presented in the EIAR Report.

9.7.4 The Proposed Development turbine layout will be designed where possible, to minimise impacts on the settings of designated heritage assets. Where avoidance of impacts is not possible appropriate additional compensatory mitigation will be proposed.

## 9.8 Potential Impacts

9.8.1 The Proposed Development would have the potential to result in a direct impact on hitherto unknown buried archaeological and palaeoenvironmental remains.

9.8.2 The Proposed Development would have the potential to result in impacts (including cumulative impacts) on the settings of heritage assets in the wider landscape. A 10km study area extending from the Site boundary will be employed, along with consultation with statutory consultees, to identify assets to be assessed in the EIA Report.

## 9.9 Receptors and Impacts Scoped In and Out of Assessment

9.9.1 With the exception of the HONO WHS, impacts on the settings of heritage assets beyond 10km of the Proposed Development will be scoped out, as most assets beyond that distance will be too far distant to have their settings significantly adversely affected by the Proposed Development.

9.9.2 A detailed assessment of the cultural heritage impacts of decommissioning the Proposed Development will be scoped out of the EIA because: (i) the future baseline conditions (environmental and other developments) cannot be predicted accurately at this stage; (ii) the detailed proposals for decommissioning are not known at this stage, and (iii) the best practice decommissioning guidance methods will likely change during the lifetime of the Proposed Development.

## 9.10 Scoping Questions to Consultees

- Is the proposed assessment methodology, including proposed study areas, accepted?
- Are there any assets beyond the proposed study areas that consultees would like to see scoped into the assessment?

# 10. Traffic and Transport

## 10.1 Introduction

10.1.1 The section covers the predicted transport and access issues that may arise from the construction of the Proposed Development, the significance of these effects and what suitable mitigation can be put in place to avoid, minimise or offset any adverse impact.

10.1.2 The Transport and Access EIA Report Chapter will be supported by a Transport Assessment (TA) report, Abnormal Load Route Survey and technical figures

10.1.3 The key issues for consideration as part of the assessment will be:

- The temporary change in traffic flows and the resultant, temporary effects on the study network during the construction phase;
- The physical mitigation associated with the delivery of abnormal loads;
- The design of new access infrastructure; and
- The consideration of appropriate and practical mitigation measures to avoid, minimise or offset any temporary effects.

10.1.4 The potential effects of these will be examined in detail.

## 10.2 Baseline Description

10.2.1 Access to the Proposed Development will be taken from the public road running between Boardhouse and Birsay. Construction traffic associated with the development will generally approach from the south east and all abnormal load traffic access from Hatston Pier via the A965, A986 and A697.

10.2.2 A site visit will be undertaken as part of the Abnormal Indivisible Loads (AIL) route survey. This will also review general road infrastructure and other relevant points.

10.2.3 An appropriate access junction will be provided to cater for general construction traffic, abnormal loads deliveries and ongoing operational access to the Proposed Development. The junction will be described in the transport submissions and an indicative layout plan of the junction will be provided.

10.2.4 AIL associated with the turbine will be examined in a Route Survey Report that will be appended to the EIA Report. Swept path assessments and traffic management requirements necessary for the safe and efficient delivery of the loads will be detailed in the EIA Report.

## 10.3 Guidance and Legislation

10.3.1 The following policy and guidance documents will be used to inform the EIA Report Chapter:

- Transport Assessment Guidance (Transport Scotland, 2012);
- The Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Assessment (IEA), 1993); and
- SPP (Scottish Government, 2014).

## 10.4 Study Area

10.4.1 The study area for the transport will reflect the access routes for the delivery of construction materials and will include the following:

- The A965 between Hatston Pier and the junction with the A986;

- The A986 between its junction with the A965 through to Birsay; and
- Wattle Road.

## 10.5 Assessment Methodology

10.5.1 Existing traffic count data will be used from the Department for Transport (DfT) database for the A965, A986 and A697. New Automated Traffic Count (ATC) surveys for the public road running between Boardhouse and Birsay will commissioned and deployed for one week to record classified traffic data for a neutral month.

10.5.2 Three years of traffic accident data will be collected using the online resource crashmap.co.uk for the study area to inform the baseline review.

10.5.3 Online sources such as the National Cycle Route map and Ordnance Survey maps will be used to obtain details of the sustainable travel network.

10.5.4 The Guidelines for the Environmental Assessment of Road Traffic (IEMA, 1993) sets out a methodology for assessing potentially significant environmental effects. In accordance with this guidance, the scope of assessment will focus on:

- Potential impacts (of changes in traffic flows) on local roads and the users of those roads; and
- Potential impacts (of changes in traffic flows) on land uses and environmental resources fronting these roads, including the relevant occupiers and users.

10.5.5 The following rules taken from the guidance will be used as a screening process to define the scale and extent of the assessment:

- Rule 1: Include highway links where traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%); and
- Rule 2: Include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.

10.5.6 Increases below these thresholds are generally considered to be insignificant given that daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flow below this level predicted as a consequence of the Proposed Development will therefore be assumed to result in no significant environmental impact and as such no further consideration will be given to the associated environmental effects.

10.5.7 The estimated traffic generation of the Proposed Development will be compared with baseline traffic flows, obtained from existing traffic survey data, in order to determine the percentage increase in traffic. It is currently understood that new traffic surveys will not be required and that existing data will be sufficient for this process.

10.5.8 Potentially significant environmental effects will then be assessed where the thresholds as defined above are exceeded. Suitable mitigation measures will be proposed, where appropriate.

10.5.9 Committed development traffic, i.e. those from proposals with planning consent, will be included in baseline traffic flows, where traffic data for these schemes is considered significant and is publicly available. Developments that are proposed or at Scoping would not be included.

10.5.10 It is not anticipated that a formal Transport Assessment will be required as these are not generally considered necessary for temporary construction works. A reduced scope Transport Assessment is therefore proposed to focus only on the temporary construction works.

10.5.11 Each turbine is likely to require between 11 and 14 abnormal loads to deliver the components to site. The components will be delivered on extendable trailers which will then be retracted to for the return journey.

10.5.12 Detailed swept path analyses will be undertaken for the main constraint points on the route from the port of entry through to the Site access junction to demonstrate that the turbine components can be delivered to site and to identify any temporary road works which may be necessary.

## 10.6 Proposed Mitigation

10.6.1 Standard mitigation measures that are likely to be included in the assessment are:

- Production of a Construction Traffic Management Plan;
- The design of suitable access arrangements with full consideration given to the road safety of all road users;
- A Staff Sustainable Access Plan; and
- A Framework Abnormal Load Transport Management Plan.

10.6.2 Additional mitigation will be included should the assessment reveal criteria that are significant following the application of standard mitigation measures.

## 10.7 Potential Impacts

10.7.1 Potential impacts that may arise during the assessment may include the following for users of the road and those resident along the delivery routes:

- Severance;
- Driver delay;
- Pedestrian delay;
- Pedestrian amenity;
- Fear and intimidation; and,
- Accidents and safety.

10.7.1 The impacts on receptors within the Study Area will be reviewed during the construction phase, with a peak construction period assessment undertaken. This will review the maximum impact and presents a robust assessment of the effects of construction traffic on the local and trunk road networks.

10.7.2 The effects that will be considered will be based upon percentage increases in traffic flow and reviewed against the impacts noted above.

## 10.8 Receptors and Impacts Scoped In and Out of Assessment

10.8.1 Once operational, it is envisaged that the level of traffic associated with the Proposed Development will be minimal. Regular monthly or weekly visits would be made to the wind farm for maintenance checks. The vehicles used for these visits are likely to be 4x4 vehicles and there may also be the occasional need for an HGV to access the wind farm for specific maintenance and/or repairs. It is considered that the effects of operational traffic would be negligible and therefore no detailed assessment of the operational phase is proposed.

10.8.2 The traffic generation levels associated with the decommissioning phase will be less than those associated with the development phase as some elements such as access roads will be left in place on the Site. As such, the construction phase is considered the worst case assessment to review the impact on the study area. An assessment of the decommissioning phase will therefore not be undertaken, although a commitment to reviewing the impact of this phase will be made immediately prior to decommissioning works proceeding.

## 10.9 Scoping Questions to Consultees

10.9.1 We would be grateful if the consultees could consider the following queries:

- That the proposed methodology is acceptable?
- That the methods proposed for obtaining traffic flow data are acceptable?
- That the use of Low National Road Traffic Forecasts (NRTF) is acceptable for the whole of the study?
- What committed development schemes should be included in the assessment?

# 11. Socio-Economics, Recreation and Tourism

## 11.1 Introduction

11.1.1 This chapter will consider the potential land-use, socio-economic, recreation and tourism effects from the Proposed Development. This includes a consideration of existing land uses within the Site, local recreation and tourism activity, employment generation and any indirect or induced economic effects from the Proposed Development.

## 11.2 Baseline Description

11.2.1 The baseline assessment will include a description of the current socio-economic, recreation and tourism baseline within the local area. This will include a summary of economic performance data and a description of the relevant tourism assets that will be covered in the assessment.

11.2.2 The baseline description will cover and compare the study areas of:

- Orkney Islands; and
- Scotland.

11.2.3 The economic impacts will be quantified for Orkney Islands and Scotland.

11.2.4 The baseline study will cover:

- the demographic profile of the local area within the context of national demographic trends;
- employment and economic activity in the local area within the national economy;
- the industrial structure of the local area within the context of the national economy;
- wage levels within the local economy compared to the national level; and
- the role of the tourism sector in the local economy, with consideration to assets, including accommodation providers and public paths, in the vicinity of the Proposed Development (15 km).

## 11.3 Guidance and Legislation

11.3.1 There is no specific legislation or guidance available on the methods that should be used to assess the socio-economic impacts of a proposed onshore wind farm development. The proposed method has however been based on established best practice, including the method used in UK Government and industry reports on the sector. In particular this assessment will draw from two studies by BiGGAR Economics on the UK onshore wind energy sector, a report published by RenewableUK and the DECC in 2012 on the direct and wider economic benefits of the onshore wind sector to the UK economy and a subsequent update to this report published by RenewableUK in 2015, as well as data gathered from the industry since those reports were published.

11.3.2 There is also no formal legislation or guidance on the methods that should be used to assess the effects that wind farm developments may have on general tourism and recreation interests. The proposed method will consider individual attractions and tourism facilities to assess if there could be any effects from the development.

11.3.3 For recreational assets, guidance has been provided by NatureScot on how to assess effects on recreational amenity and the approach outlined has been used . This takes into consideration a number of potential effects, including direct effect on facilities, such as limitation or restrictions on access, and effects on the intrinsic quality of the resources enjoyed by people. In general, this guidance would consider recreational and access impacts to potentially be significant if:

- permanent or long-term effects on the resources on which enjoyment of the natural heritage depends, in particular where facilities have been provided by NS or others under statutory powers;
- permanent or long-term change that would affect the integrity and long-term sustainable management of facilities which were provided by NS or others under statutory powers;
- where there are recreational resources for open air recreation pursuits affected by the proposal which have more than local use or importance, especially if that importance is national in significance;
- major constraints on or improvements for access or accessibility to designated natural heritage sites; and
- where mitigation and/or compensatory or alternative recreational provision is considered to be inadequate.

11.3.4 Effects will be considered based on the guidance from Guidelines for Environmental Impact Assessment and a Handbook for EIA .

11.3.5 It is also important that the socio-economic, tourism and recreation chapter takes account of the relevant local and national policy objectives. The most relevant are expected to include national and local economic and tourism strategies, including:

- Scottish Government (2020), Economic Recovery Implementation Plan;
- Scotland's National Strategy for Economic Transformation (due to be published before submission of the EIA draft);
- Scottish Government (2018), Scotland's National Performance Framework;
- Orkney Islands Council (2018), Orkney Council Plan 2018-2023;
- Orkney Islands Council (2017), Orkney Sustainable Energy Strategy 2017-2025;
- Ofgem Conditional Decision on Orkney Final Needs Case;
- Highlands and Islands Enterprise (2019), Highlands and Islands Enterprise 2019-2022 Strategy; and
- Scottish Tourism Alliance (2021), Scotland Outlook 2030.

## 11.4 Proposed Scope of Assessment

11.4.1 It is anticipated that the contents of the assessment chapter will include:

- introduction, including scope of assessment and methodology;
- economic development and tourism strategic context;
- baseline socio-economic, tourism and recreation context;
- socio-economic assessment;
- tourism and recreation impact assessment
- proposed measures and actions to maximise local economic impacts;
- proposed measures and actions to mitigate any harmful effects (if required); and

- summary of findings and conclusions.

11.4.2 This will be a desk-based study and there will be no stakeholder consultations undertaken as part of this study.

## 11.5 Assessment Methodology

11.5.1 Assessing the significance of effects will be based on assessing the sensitivity of an economy or tourism and recreation asset to change and then assessing the potential magnitude of change associated with the Proposed Development. When sensitivity and magnitude are combined, the significance of effect will be assessed. Major and moderate effects will be considered significant in the context of the EIA Regulations.

11.5.2 In order to assess the magnitude of socio-economic impacts, the level of activity/employment supported during the construction and operation phases will be estimated.

11.5.3 Government and industry reports will be used to determine the expected capital and operational expenditure associated with the Proposed Development, as well as the breakdown of expenditure by different contracts (e.g. turbine, balance of plant). An assumption will then be made based on the share of each type of contract that can be secured locally and nationally. This increase in turnover will then be used to estimate the economic impact associated with the proposed Development.

11.5.4 In order to assess effects on tourism and recreation assets, the features that make them distinctive and attractive, such as how they display local heritage, will be identified. The potential impact of the Proposed Development on those key features will then assessed, with consideration of other chapters of the EIAR where relevant, to determine the magnitude of change.

## 11.6 Proposed Mitigation

11.6.1 Proposed mitigation measures will depend on the findings of the assessment and potential effects identified.

## 11.7 Potential Impacts

11.7.1 The issues that will be considered in this assessment will include the potential socio-economic, tourism and recreation effects associated with the Proposed Development.

11.7.2 An economic impact analysis will be undertaken using the methodology developed by BiGGAR Economics; which has been used to assess over 140 onshore wind farms across the UK. The potential socio-economic effects that will be considered are:

- temporary effects on the local and national economy due to expenditure during the construction phase;
- permanent effects on the local and national economy due to expenditure associated with the ongoing operation and maintenance of the Proposed Development;
- permanent effects as a result of any additional public expenditure that could be supported by the additional tax revenue that would be generated by the development during the operational phase; and
- permanent effects on the local economy that could be supported by any community funding and/or shared ownership proposals during the operational phase of the development.

11.7.3 Consideration will also be given to wider economic effects, such as any contribution the project might make to the needs case for investment in the electricity transmission infrastructure between Orkney and the Scottish mainland.

11.7.4 The link between onshore wind energy developments and the tourism sector has been a subject of debate. However, the most recent research has not found a link between tourism employment, visitor numbers and onshore wind development. For example, in 2021 BiGGAR Economics published a study that included 44 case studies of Scottish wind farms finding that there was no evidence of a relationship between the development of onshore wind farms and tourism employment at the level of the Scottish economy, at the local authority level nor in the areas immediately surrounding wind farm developments.

11.7.5 Nevertheless, the tourism sector is an important contributor to the Orkney economy and so there is merit in considering whether the development will have any effect on the tourism sector. This assessment will consider the potential effects that the development could have on tourism attractions, routes, trail, and local accommodation providers. This will consider the implications of any effects identified for the tourism sector in the local area.

## 11.8 Receptors and Impacts Scoped In and Out of Assessment

11.8.1 The potential direct socio-economic effects will include:

- temporary effects on the local and national economy due to expenditure during the construction phase; and
- permanent effects on the local and national economy due to expenditure associated with the operational phase.

11.8.2 The potential indirect socio-economic effects will include:

- permanent effects as a result of any additional public expenditure that could be supported by the additional tax revenue that would be generated during the operational phase; and
- permanent effects on the local economy that could be supported by any community funding or shared ownership proposals during the operational phase

11.8.3 Direct and indirect effects on tourism and recreation assets, such as accommodation providers and visitor attractions, will also be considered.

## 11.9 Scoping Questions to Consultees

- Consultees are asked for suggestions on any socio-economic and tourism effects that should be specifically considered in the report.

# 12. Aviation

## 12.1 Introduction

12.1.1 This section provides an indication of the potential effects of the construction and operation of the Proposed Development on aviation. Further, it provides a summary of the full assessment methodology to be adopted and the key reference documents covering legislation, policy and guidance.

## 12.2 Baseline Description

12.2.1 There are no apparent aviation impacts and hence no objections are anticipated. The Site lies over 25 km north west of Kirkwall Airport, operated by Highlands and Islands Airports Limited (HIAL). This is beyond the limits of physical safeguarding surfaces. There are also no potential impacts to key military or civil radar installations. The Site lies within an area identified as of low priority for military low flying. The Site is well beyond the limits of safeguarding areas for any navigational aids or radio communication stations.

## 12.3 Guidance and Legislation

12.3.1 There are a number of publications providing key legislation, policy and guidance. Together these place a responsibility on the planning authorities and the developer to assess potential impacts on aviation. The summary below highlights the main generic documents; it is not exhaustive.

12.3.2 Scottish Planning Policy (Dec 2020) states that consideration should be given to the "impacts on aviation and defence interests and seismological recording".

12.3.3 CAA guidance, within Civil Aviation Publication (CAP) 764 (CAA Policy and Guidance on Wind Turbines), sets out recommended consultation and assessment criteria for the impacts of wind turbines on all aspects of civil aviation. Note that the CAA involvement in the Wind Farm Pre-Planning Consultation Process has ceased; CAP 764 now states that "developers are required to undertake their own pre- planning assessment of potential civil aviation related issues" and that "it is incumbent upon the developer to liaise with the appropriate aviation stakeholder to discuss – and hopefully resolve or mitigate – aviation related concerns without requiring further CAA input."

12.3.4 The Scottish Onshore Wind Policy Statement, December 2017, notes the potential impacts of wind developments, especially on radar and mitigation methods. It suggests longer term strategic direction towards self-management of the issues by the aviation sector to reduce the financial burden on the wind energy sector.

12.3.5 CAA CAP 393, The Air Navigation Order and Regulations, specifies the statutory requirements for the lighting of onshore wind turbines over 150 m tall. CAA Policy Statement (June 2017) 'Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150 m Above Ground Level', highlights and clarifies the requirements set out in CAP 393.

12.3.6 Planning Circular 2/03, Safeguarding of Aerodromes, Technical Sites and Military Explosives Storage Areas, contains annexes which describe the formal process by which planning authorities should take into account UK MoD safeguarding, including in relation to wind energy developments. As a statutory consultee, the MOD will be consulted through the Section 36 scoping application. They publish a guidance document on www.gov.uk called 'Wind farms: MOD safeguarding', Updated July 2021. The MOD wind energy team liaises with a broad range of experts to formulate a comprehensive MOD response. Where the MOD has concerns about a development the team will work with the developer to look for ways to mitigate them.

## 12.4 Study Area

12.4.1 The area of interest relating to aviation and radar impacts is determined by considering all aerodromes in the region and all radar either to the limit of their range or the limit of their safeguarding areas. A review of receptors with respect to the above generates a location specific list of relevant stakeholders and consultees.

12.4.2 In the case of the Proposed Development, the relevant stakeholders are:

- HIAL (Kirkwall Airport);
- NATS En-route; and
- The MOD.

## 12.5 Assessment Methodology and Potential Impacts

12.5.1 The acceptability of the proposed development, in terms of net effects on aviation related interests, is established through direct consultation with all relevant stakeholders within the consenting process. The initial task is to independently assess the potential effects and where significant effects may occur, to enter a dialogue with the affected stakeholders. Where impacts are of concern additional analysis may be required and where impacts are deemed unacceptable, mitigation solutions identified and explored with the goal of reducing impacts to acceptable levels. While the aim of this dialogue is to enable the approval of all stakeholders before full submission, this is not always possible. In the case of impacts, typically solutions are identified but do not reach full maturity in terms of the assessment by the stakeholders and the contracting of mitigation (where required) until formal consent applications have been submitted.

12.5.2 The initial impact assessment aims to exhaustively identify all potential issues and the associated stakeholders affected by the proposed development. This involves considering all military and civil aerodromes in the wider area out to circa 60 km, all radar installations out to the limit of their range, all navigational aids, air-ground-air communications stations and low flying activities. A provisional lighting design will be generated to inform the LVIA. This will need to be finalised post consent, through agreement with the CAA before construction.

12.5.3 No significant impacts are anticipated. To mitigate any risk to civil and military low flying, both infra-red and visible spectrum lighting will be specified. The visible spectrum lighting will only operate under conditions of low light, principally from dusk to dawn. Every effort will be made to reduce lighting impacts, by minimising the number of turbines lit, their intensity and the hours of operation. The potential for an Aircraft Detection Lighting Scheme will be examined in detail. ADLS can greatly reduce periods of lighting at night by triggering the lights only when an aircraft is in the vicinity at low altitude.

## 12.6 Consultation

12.6.1 The scoping submission will generate an initial view from the HIAL, the MoD and NATS.

12.6.2 The other key consultees relate to the design and approval of an aviation obstacle lighting scheme. This will require consultation with local airspace users such as Police Scotland and the Scottish Air Ambulance Service, with responses supporting a scheme to be provided to the CAA for their assessment and approval.

## 12.7 Scoping Questions to Consultees

12.7.1 The assessment of aviation impacts will be conducted by the stakeholders independent of any analysis conducted by the Applicant, based on the details of the Proposed Development provided by OIC during scoping. Any concerns raised within scoping will be addressed by the applicant as far

as possible ahead of a full planning application. This would involve the engagement of the concerned stakeholder at that stage.

# 13. Telecommunications

## 13.1 Introduction

13.1.1 This section considers potential issues associated with telecommunications as a result of the Proposed Development during construction, operation and decommissioning phases.

## 13.2 Legislation, Policy and Guidance

13.2.1 The following legislation, policy and guidance will be used to inform the telecommunication assessment:

- Wireless Telegraphy Act (UK Government, 2006);
- OIC. Supplementary Guidance: Energy (OIC, 2017);
- Planning Advice Note: PAN 62 Radio Telecommunications (Scottish Government, 2001b); and
- Tall structures and their impact on broadcast and other wireless services (Ofcom, 2009).

## 13.3 Proposed Scope of Assessment

### Telecommunications

13.3.1 Any potential effects on communication links will be sought through formal consultation with Spectrum Licensing (previously known as Ofcom) and all relevant link operators. Where possible and applicable, the turbines will be designed to take into account the minimum separation distance from identified communication link(s). An assessment will be made as to the significance of potential operational effects and where appropriate, suitable mitigation measures will be discussed.

### Television

13.3.2 The closest television transmitter is the Keelyland Hill transmitter, located approximately 20 km south east of the Site. This transmitter has switched to digital transmission only. Currently there is no widely accepted method of determining the potential effects of wind turbines on digital television reception, however digital television signals are better at coping with signal reflections, and do not suffer from ghosting that may occur with analogue signals.

13.3.3 To date, there are very few cases of wind turbine interference with digital television reception post-digital switchover. Given the strength of the digital signal in the area and the inherently resilient nature of digital television reception, there is considered to be a low risk of any interference from a wind energy development at this location on domestic television reception.

13.3.4 Due to the low risk of interference with television reception, the requirement to address any reception issues once the Proposed Development is operational could be conditioned in any consent granted. For the above reasons, it is not proposed to carry out a detailed assessment of potential effects on television reception and this topic therefore will be scoped out of further assessment.

## 13.4 Assessment Methodology and Potential Impacts

13.4.1 No assessment is proposed at this stage; should the need to assess potential impacts arise following consultation with relevant stakeholders, the studies will be commissioned as necessary.

## 13.5 Potential Mitigation

13.5.1 Should they be required, the mitigation measures will be agreed through direct dialogue between the Applicant and relevant stakeholders.

## 13.6 Receptors and Impacts Scoped in or out of Assessment

13.6.1 Telecommunications and television are determined to not be impacted by the Proposed Development and are scoped out of the assessment at this stage.

## 13.7 Scoping Questions to Consultees

- Do consultees agree to the above methodology?
- Do consultees have any comments regarding any receptors which they predict may be subject to significant effects from the Proposed Development?

# 14. Shadow Flicker

14.1.1 This section considers shadow flicker, which is an effect caused by the rotation of the turbine blades when the sun is shining, which can create a flickering or strobe like effect. It can be distracting and disturbing for people who are affected. Effects occur usually when the frequency of the flicker is less than 1.5 Hz.

## 14.2 Guidance and Legislation

14.2.1 There are at present no formal guidelines available on what exposure would be acceptable in relation to shadow flicker. There is no standard for the assessment of shadow flicker. The specific advice sheet from Scottish Government, Onshore Wind Turbines, a web-based guide (Scottish Government, 2014) sets out the potential geographic area which may fall under assessment: *"Where this (shadow flicker) could be a problem, developers should provide calculations to quantify effect. In most cases however, where separation is provided between turbines and nearby dwellings (as a general rule ten rotor diameters), 'shadow flicker' should not be a problem."*

14.2.2 Published research by the Department of Energy and Climate Change (DECC), Update of UK Shadow Flicker Evidence Base (DECC, 2011), evaluates the current international understanding of shadow flicker and confirms an acceptable study area for assessment is ten rotor diameters from each turbine and within 130 degrees either side of north.

## 14.3 Proposed Scope of Assessment

14.3.1 Potential for shadow flicker impacts will be assessed at all residential receptors within the shadow flicker study area.

14.3.2 As detailed above, the shadow flicker study area includes the area within a distance of 10 times the rotor diameter and 130 degrees either side of north for each turbine. The study area and any receptors which fall within it will be confirmed with OIC. Initial high level analysis suggests that there will be some residential receptors that will need to be assessed.

## 14.4 Assessment Methodology and Potential Impacts

14.4.1 The shadow flicker assessment, if required, will be undertaken using WindPRO computer modelling software and will be run for both a worst case scenario (accounting for 365 sunshine days per year and 100% turbine operation) and realistic scenario (using, where possible, measured meteorological data and 85% turbine operation) on the potential shadow flicker occurrence for a 1 m x 1 m ground floor window at each identified sensitive receptor location, assumed to be facing directly towards the Proposed Development.

14.4.2 The sensitivity of the receptors will be considered to be high unless there are particular reasons for reduced sensitivity. A significant effect will be noted where a receptor is identified as experiencing greater than 30 hours of flicker a year or more than 30 minutes per day on the worst affected day (based on the realistic scenario), which ever if greater (DECC, 2011).

14.4.3 The assessment will present clear findings on the estimated number of hours of shadow flicker impact anticipated for each receptor, for both scenarios. Where required, potential mitigation measures will be discussed.

14.4.4 No impacts are anticipated during construction or decommissioning.

## 14.5 Potential Mitigation

14.5.1 If required, the Applicant will implement a shadow flicker protocol during construction to mitigate shadow flicker impacts.

## 14.6 Receptors and Impacts Scoped In and Out of Assessment

14.6.1 The impact of shadow flicker caused by the Proposed Development will be assessed as per the above methodology.

## 14.7 Scoping Questions to Consultees

- Do consultees agree to the above study area and assessment methodology?

# 15. Other Issues

## 15.1 Risk of Major Accidents and/or Disaster

15.1.1 Given the nature of the Proposed Development, and its remote location, the risk of a major accident or disaster is considered to be extremely low. The Principal Designer will ensure a Design Risk Assessment process is followed during the design phase to ensure designers fully assess risks and mitigate to a level deemed as low as reasonably practicable during the design stage as part of the requirements of the Construction (Design and Management) Regulations (2015).

15.1.2 During the operational phase of the Proposed Development, routine maintenance inspections will be completed in order to ensure the safe and compliant operation of all built infrastructure.

15.1.3 It is therefore proposed that an assessment of the risk of major accidents and/or disasters is **scoped out** of the EIA.

## 15.2 Air Quality and Human Health

15.2.1 The air quality of the site is expected to be good due to the rural location, with few pollution sources.

15.2.2 During the construction of the wind farm, the movement of vehicles and the on-site plant would generate exhaust emissions. Given the short-term nature of the construction period and the limited area to be developed, effects on air quality are likely to be negligible.

15.2.3 Construction activities have the potential to generate dust during dry spells, which may adversely affect local air quality. Given the scale and nature of construction activities and given the distance between construction areas and the nearest residential properties, it is considered that dust from construction is unlikely to cause a nuisance, particularly with the implementation of standard mitigation measures as required, e.g. wheel washes; dampening of loads.

15.2.4 An operational wind farm produces no notable atmospheric emissions. The operation of the wind farm would therefore have no discernible adverse effects on local or national air quality.

15.2.5 Relevant mitigation measures for air quality, dust and pollution control will be captured within the site-specific CEMP.

15.2.6 The assessment of potential human health effects will be undertaken in the context of residential amenity (i.e. visual impact, noise and shadow flicker).

15.2.7 It is therefore proposed that an assessment of air quality & human health is **scoped out** of the EIA.

# 16. Summary

16.1.1 This EIA Scoping Report outlines the proposed technical and environmental assessment that will be included within the EIA Report for the Proposed Development. The proposed scope and methodologies for each assessment have been provided and the guidance to be followed set out. Should any further information be required in order that a full EIA Scoping Opinion can be provided we would be happy to provide further information and/or discuss any further requirements.

# 17. References

Band, W., Madders, M. & Whitfield, D.P. (2007) Developing field and analytical methods to assess avian collision risk at wind farms. In de Lucas, M., Janss, G. & Ferrer, M. (eds.) Birds and Wind Power. Quercus, Madrid.

BGS (2022). GeoIndex Onshore. Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html Accessed on: 18/01/2022

BiGGAR Economics (2012) Onshore Wind: direct & wider economic impacts. Available at: https://www.gov.uk/government/publications/onshore-wind-direct-and-wider-economic-impacts

BiGGAR Economics (2014) Onshore Wind: Economic Impacts in 2014. Available at: https://cdn.ymaws.com/www.renewableuk.com/resource/resmgr/publications/reports/onshore_economic_benefits_re.pdf

Chartered Institute for Archaeologists (CIfA). (2019) Code of Conduct. Available at: https://www.archaeologists.net/codes/cifa Accessed on: 08/02/2022

Chartered Institute for Archaeologists (CIfA). (2014) Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment. Available at: https://www.archaeologists.net/codes/cifa Accessed on: 08/02/2022

Chartered Institute for Archaeologists (CIfA). (2014) Standard and guidance for historic environment desk-based assessment Available at: https://www.archaeologists.net/sites/default/files/CIfAS&GDBA_2.pdf Accessed on: 08/02/2022

CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and Marine. Version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

European Parliament (2000) The Water Framework Directive 2000/60/EC. Available at: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32000L0060

Gilbert, G., Gibbons, D.W. & Evans, J. (1998) Bird Monitoring Methods. RSPB, Sandy.

Hardey, J., Crick, H., Wernham, C., Riley, H. & Thompson, D. (2013): Raptors: a field guide to survey and monitoring. 3rd Edition Edinburgh: The Stationery Office

HMSO. (1979) Ancient Monuments and Archaeological Areas Act. Accessed at: http://www.legislation.gov.uk/ukpga/1979/46/pdfs/ukpga_19790046_en.pdf Accessed on: 08/02/2022

HMSO. (1997a). Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 Accessed at: https://www.legislation.gov.uk/ukpga/1997/9/pdfs/ukpga_19970009_en.pdf Accessed on: 08/02/2022

HMSO. (1997b). Town and Country Planning (Scotland) Act 1997 Available at: https://www.legislation.gov.uk/ukpga/1997/8/pdfs/ukpga_19970008_en.pdf Accessed on: 08/02/2022

HMSO (2011) Historic Environment (Amendment) (Scotland) Act 2011. Available at: http://www.legislation.gov.uk/asp/2011/3/pdfs/asp_20110003_en.pdf Accessed: 08/02/2022

Historic Environment Scotland (HES). (2020) Managing Change in the Historic Environment. Available at: https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=80b7c0a0-584b-4625-b1fd-a60b009c2549 Accessed on: 08/02/2022

Historic Environment Scotland (HES). (2019a). Historic Environment Policy for Scotland (HESP). Available at: https://www.historicenvironment.scot/advice-and-support/planning-and-guidance/historic-environment-policy-for-scotland-heps/ 08/02/2022

Historic Environment Scotland (HES). (2019b) Designation Policy and Selection Guidance. Available at: https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=8d8bbaeb-ce5a-46c1-a558-aa2500ff7d3b Accessed on: 08/02/2022

Historic Environment Scotland (HES). (2019c). Scotland's Listed Buildings. Available at: https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=34c90cb9-5ff3-45c3-8bc3-a58400fcbc44 Accessed on: 08/02/2022

IEMA (2017) Environmental Impact Assessment Guide. Available at: https://www.iema.net/assets/newbuild/documents Accessed on 08/02/2022

NatureScot (2017). Visual Representation of Wind Farms, Version 2.2. Available at: https://www.nature.scot/doc/visual-representation-wind-farms-guidance. Accessed 27 January 2022.

NatureScot (2020). Assessing Impacts on Wild Land Areas – technical guidance. Available at: https://www.nature.scot/doc/assessing-impacts-wild-land-areas-technical-guidance . Accessed 27 January 2022.

NatureScot (2021). Guidance – Assessing the cumulative landscape and visual impact of onshore wind energy developments.

Orkney Local Biodiversity Action Plan Steering Group (2018). Orkney Local Biodiversity Action Plan 2018 to 2022. Available at: http://www.orkney.gov.uk/Service-Directory/L/Local-Biodiversity-Plan.htm

Orkney Islands Council. (2010). The Heart of Neolithic Orkney World Heritage Site: Supplementary Planning Guidance. Available at: http://www.orkney.gov.uk/Files/Planning/Development-and-Marine-Planning/The_Heart_of_Neolithic_Orkney_World_Heritage_Site_SG.pdf. Accessed on: 08/02/2022.

Orkney Island Council. (2017a). Orkney Local Development Plan. Available at: http://www.orkney.gov.uk/Files/Planning/Development-and-Marine-Planning/Local-Plan/OLDP_2017/Orkney_Local_Development_Plan_2017_2022.pdf. Accessed on: 08/02/2022.

Orkney Islands Council. (2017b). Supplementary Guidance: Historic Environment and Cultural Heritage. Available at: http://www.orkney.gov.uk/Files/Planning/Development-and-Marine-Planning/Adopted_PPA_and_SG/Guidance_for_the_Plan/Historic_Environment_and_Cultural_Heritage_Supplementary_Guidance.pdf. Accessed on: 08/02/2022.

Orkney Islands Council. (2017c). Planning Policy Advice: Historic Environment (Topics and Themes). Available at: https://www.orkney.gov.uk/Files/Committees-and-Agendas/Council-Meetings/GM2017/09-03-2017/I14_App4_PPA_Historic_Env_Topics_Themes.pdf. Accessed 08/02/2022.

Orkney Islands Council. (2017d). Supplementary Guidance: Energy Available at: https://www.orkney.gov.uk/Files/Planning/Development-and-Marine-Planning/Adopted_PPA_and_SG/Energy_SG/Energy_SG.pdf

Reynolds, P. (2002). Orkney vole habitat guidance Archive report No. 029. NatureScot.

Scottish Government. (2011) PAN2/2011 Planning and Archaeology

Scottish Government. (2014). Scottish Planning Policy (SPP). Available at: https://www.gov.scot/publications/scottish-planning-policy/ Accessed on: 08/02/2022

Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland Science, AEECoW (2019). Good Practice during Wind Farm Construction. 4th Ed. 2019. Joint Publication.

SEPA (2017). Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Land Use Planning System SEPA Guidance Note 31, version 3, September 2017. Scottish Environment Protection Agency.

SEPA (2015). Water Environment Hub. Available at: https://www.sepa.org.uk/data-visualisation/water-environment-hub/ Accessed on: 18/01/2022

SEPA (2017). Land Use Planning System Guidance Note 31 – Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems.

SEPA (2021). The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended): A Practical Guide. Available at: https://www.sepa.org.uk/media/34761/car_a_practical_guide.pdf Accessed on: 17/01/2022

SEPA (2022). Flood maps. Available at: https://www.sepa.org.uk/environment/water/flooding/flood-maps/ Accessed on: 18/01/2022

SEPA (2022). Reservoir Map. Available at: https://map.sepa.org.uk/reservoirsfloodmap/Map.htm Accessed on: 18/01/2022

SNH (2000) Windfarms and birds: calculating a theoretical collision risk assuming no avoidance action. SNH Guidance Note Series. SNH, Battleby.

SNH (2010). Use of Avoidance Rates in the SNH Collision Risk Model, SNH, Battleby.

SNH (2012a) Assessing the cumulative impact of onshore wind energy developments. SNH Guidance. SNH, Battleby.

SNH (2016) Assessing Connectivity with Special Protection Areas (SPAs). Guidance. Version 3. SNH, Inverness.

SNH (2016). Planning for development: What to consider and include in Habitat Management Plans – Guidance. Version 2, March 2016. SNH, Battleby.

SNH (2017) Recommended bird survey methods to inform impact assessment of onshore wind farms. Version 2. Scottish Natural Heritage, Inverness.

Scottish Natural Heritage (2020) General Pre-application and Scoping Advice to Developers of Onshore Wind Farms

SNH (2018a). Advising on carbon-rich soils, deep peat and priority peatland habitat in development management.

SNH (2015). Scotland's National Peatland Plan.

SNH (2016) Assessing connectivity with Special Protection Areas (SPAs). Scottish Natural Heritage

Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747. Available online at: https://britishbirds.co.uk/content/status-our-bird-populations.

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