ARCUS

ACKRON WIND FARM

SCOPING REPORT

APRIL 2019

airvolution

Statkraft

Prepared By:

Arcus Consultancy Services

7th Floor
144 West George Street
Glasgow
G2 2HG

T +44 (0)141 221 9997 l E info@arcusconsulting.co.uk
w www.arcusconsulting.co.uk

Registered in England & Wales No. 5644976

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Ackron Wind Farm Ltd (the Applicant) intends to submit a major application to the Highland Council (the Council) under the Town and Country Planning (Scotland) Act (1997)[1] as amended by the Planning etc. (Scotland) Act 2006[2] for permission to construct and operate Ackron Wind Farm (the Development) on land approximately 18 kilometres (km) west of Thurso and 2 km southeast of Melvich in Sutherland (the Site). The Location of the Site is shown in Figure 1.1.

The Development is anticipated to comprise up to 14 turbines with tip heights of up to 149.9 m with associated infrastructure. The Indicative Site Layout is detailed in Figure 1.2. Scoping Report for the Site was submitted in March 2015 (2015 Scoping Report) for a wind farm consisting of up to 9 turbines with a tip height of 125 metres (m) but progressed by a different wind farm developer. A Scoping Opinion was received from the Council in May 2015 (15/01125/SCOP).

The Development will constitute a Schedule 2 Development as provided by the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017[3] (The EIA Regulations), and it is the intention of the Applicant to submit an Environmental Impact Assessment Report (EIA Report) along with the application for consent. As per Regulation 12 of the EIA Regulations, the Applicant is seeking to confirm, with the Highland Council (the Council) and key consultees, the scope of the require assessment to be provided in the EIA Report, i.e. a "Scoping Opinion".

This document has been prepared following a number of preliminary exercises including pre-application consultation with key consultees, desk-based assessments, site visits, and review of the data gathered during field surveys undertaken for the 2015 Scoping Report. This document summarises the preliminary work undertaken to date, and in line with the EIA Regulations, aims to focus the assessment solely on those effects likely to be assessed as significant and identify those topics and / or receptors which can be scoped out as the effects are unlikely to be significant.

Table A provides a summary of effects that are deemed to be not significant and will not be considered further within the EIA Report for the Development. The evidence, on which these decisions have been based, is described within each technical section of this document.

Table A: Technical Aspects and Assessments to be Scoped Out

Technical Area	Elements to be Scoped out of EIA
Landscape and Visual (Section 5)	• Landscape Character Areas beyond 15 km radius; • Landscape Planning Designations beyond 120 km radius; • Assessment of settlements beyond 10 km; • Assessment of local paths beyond 5 km; • Assessment of residential properties beyond 2 km; and • Cumulative assessment of scoping schemes (unless within 5 km and specifically required by consultees) and consideration of turbines below 50 m to blade tip height.
Ecology (Section 6)	• All survey and assessment regarding Strathy Coast SSSI, Red Point Coast SSSI and Sandside Bay SSSI.

[1] Town and Country Planning (1997) Town and Country Planning (Scotland) Act 1997 [Online] Available at: https://www.legislation.gov.uk/ukpga/1997/8/contents (Accessed 26/03/2019)
[2] UK Government (2006) Planning etc. (Scotland) Act 2006 [Online] Available at: https://www.legislation.gov.uk/asp/2006/17/contents (Accessed 26/03/2019)
[3] Town and Country Planning (2017) Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 [Online] Available at: http://www.legislation.gov.uk/ssi/2017/102/pdfs/ssi_20170102_en.pdf (Accessed 02/04/2019)

Technical Area	Elements to be Scoped out of EIA
Ornithology (Section 7)	• Impacts on the following statutory sites: ▪ North Caithness Cliffs SPA; ▪ Caithness Lochs SPA and Ramsar site; ▪ Red Point Coast SSSI; ▪ West Halladale SSSI; and ▪ Lochan Buidhe Mires SSSI. • Impacts on non-breeding target species, except where flight activity recorded during Flight Activity Surveys is sufficient to assess collision risk impacts; and • Potential impacts on grey heron.
Archaeology and Cultural Heritage (Section 8)	• Indirect effects on undesignated heritage assets; • Direct effects on known undesignated archaeological features outwith the Site; • Indirect effects on designated heritage assets within the 10 km Study Area where the assets, or key views towards the asset, do not lie within the ZTV; and • Cumulative effects from wind farm developments outwith the 10 km Study Area.
Noise (Section 9)	• All assessment regarding construction and decommissioning noise; • Amplitude Modulation (AM) assessment; • Ground borne vibration assessment; and • Low Frequency Noise assessment.
Traffic and Transport (Section 10)	• Formal Transport Assessment as the Development will not give rise to a permanent increase in traffic numbers; • Effects of noise or air quality changes to traffic receptors; • Assessment of effects upon operational traffic; and • Assessment of construction traffic decommissioning.
Hydrology and Hydrogeology (Section 11)	• Assessment on the migration of pollutants from contaminated land; • Effects of the Development on the West Halladale SSSI; and • Pollution and sedimentation effects on the water environment at distances greater than 10 km.
Geology and Peat (Section 12)	• Solid geology; and • Potential effects arising from contaminated land.
Land Use, Socio-Economics and Tourism (Section 13)	• All assessment regarding land-use including forestry.
Climate Change and Carbon Balance (Section 14)	• All assessment regarding the Developments vulnerability and resilience to climate change.
Other Issues (Section 15)	• Human Health and Safety assessment; • Major Accidents and Disasters assessment; • Waste assessment; and • Television Reception and Utilities.

Table B summarises the key terms (unless otherwise refined in a Technical Section) used throughout this document.

Table B: Key Terms and Definitions

Term	Definition
The Site	Refers to the land that falls within the red line identified in Figure 1.1.
The Site Boundary	Refers to the red line as identified in Figure 1.2.
The Development	Refers to the application for Ackron Wind Farm, details of which are set out in Section 2: The Site and Development
2015 Scoping Report	Refers to the Scoping Report submitted in March 2015 to the Highland Council for a wind farm consisting of up to 9 turbines with a tip height of 125 metres.
The Council	Refers to the Highland Council.
EIA Report	The Environmental Impact Assessment Report, which documents the findings of the EIA process and would accompany the application for consent for the Development.

This Page Intentionally Left Blank

1 INTRODUCTION

This Scoping Report (the Report) has been prepared by Arcus Consultancy Services Ltd (Arcus) on behalf of Ackron Wind Farm Ltd (the Applicant). The Applicant is proposing to submit a major application to the Highland Council (the Council) under the Town and Country Planning (Scotland) Act (1997),[4] as amended by the Planning etc. (Scotland) Act 2006[5], for permission to construct and operate Ackron Wind Farm (the Development).

The Development would involve the construction and operation of a wind farm on land located 1,100 m northeast of Ackron Farm (the Site). The Site is located approximately 18 kilometres (km) west of Thurso and 2 km southeast of Melvich in Sutherland, Highland Council. The location of the Site is shown on Figure 1.1, Appendix A, and is described in Section 2 of the Report.

It is intended that the Report will provide the required information to allow the Council and key consultees to form a Scoping Opinion on the Development and its associated Environmental Impact Assessment (EIA).

Pre-application consultation was undertaken with the Council in January 2019, and the outcome has been given cognisance when defining the scope of the EIA. Pre-application consultation is summarised in Section 1.4.2 of the Report.

1.1 The Applicant

Ackron Wind Farm Ltd (the Applicant) is a subsidiary of Statkraft UK Ltd, managed by Airvolution Clean Energy. Airvolution Clean Energy is a leading UK wind farm developer and has built 11 onshore wind farms since 2013. In 2017, Airvolution formed a development partnership to work solely for Statkraft, Europe's largest renewable energy generator and is committed to building out at least 600 megawatts (MW) of onshore wind development in Scotland over the next five years.

1.2 Planning History

A Scoping Report for the Site was submitted in March 2015 (2015 Scoping Report) for a wind farm consisting of up to 9 turbines with a tip height of 125 metres (m) but progressed by a different wind farm developer. A Scoping Opinion was received from the Council in May 2015 (15/01125/SCOP). A range of initial baseline surveys were undertaken during and after the 2015 Scoping exercise as part of the EIA. These included:

- Ornithological surveys between May 2014 – March 2015;
- Ecological site walkover June 2014;
- Cultural heritage desk-based assessment and supplementary site visit in June 2014;
- Landscape site visits June 2014;
- Geology and soils desk-based assessment and supplementary site visit;
- Hydrological site visits;
- Desk-based noise assessment;
- Strategic access and transport baseline studies June 2014;
- Air quality desk-based assessment and supplementary site visit June 2014;
- Shadow flicker site visit to identify potential receptors June 2014; and
- Socio-economic desk-based assessment and supplementary site visit June 2014.

Following the closure of the Renewables Obligation and the exclusion of onshore wind from Contracts for Difference (CfD) auctions, the previous wind farm developer made the

[4] Town and Country Planning (1997) Town and Country Planning (Scotland) Act 1997 [Online] Available at: https://www.legislation.gov.uk/ukpga/1997/8/contents (Accessed 26/03/2019)
[5] UK Government (2006) Planning etc. (Scotland) Act 2006 [Online] Available at: https://www.legislation.gov.uk/asp/2006/17/contents (Accessed 26/03/2019)

decision to focus investment on renewable energy development outwith the UK. Statkraft UK Ltd subsequently acquired the Site as part of its portfolio for potential development options and has identified a new design, which is economically viable whilst also seeking to minimise environmental impacts.

There are currently two wind farms proposals in close proximity to the Site: Drum Hollistan and Limekiln). Drum Hollistan is located adjacent to the northern boundary of the Site with Limekilns approximately 5 km to the east. These have been subject to a conjoined public inquiry and are awaiting a decision from the Scottish Ministers.

1.3 The Development

The Development would involve the construction and operation of a wind farm on land located 1,100 m northeast of Ackron Farm (the Site). The Site is located approximately 18 kilometres (km) west of Thurso and 2 km southeast of Melvich in Sutherland, Highland Council. It is approximately 316 hectares (ha), centred on National Grid Reference (NGR) 291393, 962989. The location of the Site is shown on Figure 1.1 and is described in Section 2 of the Report. It is expected that the Development will consist of up to 14 turbines with a maximum height to blade tip of 149.9 metres (m) and a total generating capacity of between 20 – 49.9 MW. Ancillary infrastructure will also be required as part of the Development and may include a substation, external transformers, new access tracks and site entrance, temporary construction compound, crane hardstandings and a permanent meteorological mast as well as the option for battery storage.

Given the iterative nature of the EIA process, the layout of the Development is still being refined, and this will continue throughout the EIA process until all baseline surveys are completed. The Development is therefore being scoped on a preliminary turbine layout which would represent the likely geographical spread of turbine and infrastructure across the Site; the preliminary site layout is shown in Figure 1.2. The results of the Scoping process will feed into the iterative design of the Development.

The connection to the National Grid is not covered within this consenting process and will be subject to a separate consent application.

1.4 Environmental Impact Assessment & Scoping

EIA is a legal requirement for certain types of development. In determining the EIA requirement for wind turbine developments of less than 50 MW capacity, the decision on whether or not an EIA is required is delegated to local authorities.

EIAs are undertaken in accordance with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017[6] ("the EIA Regulations"). With regards to wind energy developments, Schedule 2 of the EIA regulations advises that if *"the development involves the installation of more than 2 turbines; or the height of any turbine or height of any other infrastructure exceeds 15 metres"* then that proposal may require an EIA.

Given the scale of the Development and the potential for significant effects to occur as a result of the Development, the Applicant has elected to undertake an EIA without seeking a Screening Opinion from the Council. Further description of the EIA process is presented in Section 3 of this Report.

[6] Town and Country Planning (2017) Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 [Online] Available at: http://www.legislation.gov.uk/ssi/2017/102/contents/made (Accessed 01/11/2017)

1.4.1 Scoping Report

As per Section 17 (2) of Part 4 of the EIA Regulations, the Applicant is seeking to confirm the scope of the required assessment which is to be provided in the EIA via a "Scoping Opinion". To aid this process, this Report includes the following:

- A description of the location of the Development including figures identifying the Site and the parameters of Development;
- Figures identifying the designated and sensitive environmental receptors surrounding the Site; and
- A brief description of the nature and purpose of the Development and its potential resultant effects.

This Report has considered the different aspects of the environment likely to be significantly affected by the Development and has identified those topics which require consideration as part of the EIA, with a view to inviting comments on the approach to the EIA and the content of the Environmental Impact Assessment Report (EIA Report).

1.4.2 Consultation

The process of identifying environmental effects is both iterative and cyclical, running in tandem with the iterative design process. This has already begun with pre-application consultation undertaken with the Council and key consultees in January 2019. The initial design considerations raised during the pre-application meeting included:

- Landscape and visual amenity, particularly in regards to:
  - The A836 public road which is the main tourist route along the North Coast 500 (NC500);
  - East Halladale Flows Wild Land Area;
  - Transitioning gateway experience from the settled and farmed landscapes of Caithness to the more rugged moorland of Sutherland;
  - Designing the Development to fit within existing wind energy development patterns in regards to scale.
- Effects upon peatland and peatland habitat;
- Connectivity between natural heritage designations (e.g. Caithness and Sutherland Peatlands Special Protection Area/Site of Special Scientific Interest/Ramsar Site; West Halladale Site of Special Scientific Interest).

Based upon the comments received as part of the pre-application meeting, peat probing has been undertaken across the Site and informed the scoping layout (see Section 12). Additionally, no turbines have been located adjacent to the A836/NC500. As other environmental surveys and site visits are undertaken, the design would be further refined to address design considerations raised during pre-application.

As the design and EIA progresses, consultation will form an integral part of the process. Throughout the EIA, public exhibitions will be held in locations near the Site providing members of the public the opportunity to learn more about the Development and give feedback and comments to the project team. Consultation on specific technical issues will also be undertaken with relevant consultees, where appropriate, as part of the EIA process. A list of consultees which Arcus would suggest the Council provide with this Report is contained in Appendix B. As it is the Council's discretion who is consulted on the Report, Arcus is keen to be advised as the Council sees fit.

2 THE SITE AND DEVELOPMENT

2.1 The Site and Surrounding Area

The Site is located approximately 18 kilometres (km) west of Thurso and 2 km southeast of Melvich in Sutherland, Highland Council. The Site extents and location are shown on Figure 1.1. The Site ranges from approximately 186 m Above Ordnance Datum (AOD) in the east of the Site at Beinn Ruadh, generally sloping westward to 30 m AOD along the A897.

The Site predominately comprises of open moorland used for rough grazing; there is a small area of improved pasture in the northwest and pockets of commercial forestry.

The Site lies within the Halladale River catchment with Giligill Burn, Akran Burn, and an unnamed watercourse flowing from southeast to northwest through Site. No public roads are located within the Site. The A836 lies to the north of the Site with the A897 to the west. It is preferred that access to the Site will be taken from the A836; however, all access options are currently being considered.

The Site Location and Indicative Site Layout are shown in Figures 1.1 and 1.2 respectively.

There are no residential properties within the Site with the closest residential properties being Ackron Farm (financially involved) and properties at Golval, located 1.2 km to the west of the nearest turbine and 1.5 km to the southwest of the nearest turbine, respectively.

2.2 The Development

The Development is a wind farm consisting of up to 14 turbines and ancillary infrastructure. Sections 2.2.1 to 2.2.6 provide an overview of the elements considered likely to be included in the final design of the Development.

2.2.1 Turbines

The proposed details are as follows:

- Approximate number of turbines: up to 14
- Height to blade tip: Up to 149.9 m
- Rotor Diameter: Up to 117 m
- Generating capacity (per turbine): approximately 3-4 MW
- Total generation capacity: between 20-49.9 MW

Dependent on the final turbine model, transformers may be internal or external.

The indicative Site Layout is shown in Figure 1.2. For the purposes of the EIA, a precautionary approach will be taken and, for each assessment, a worst-case scenario will be identified within the design parameters. This allows a conservative scenario to be evaluated.

2.2.2 Access Tracks

New access tracks will be required to provide access from the public highway. At this stage, it is considered likely that that access to the Development will come from the north of the Site, via the A836.

Access tracks will also be required between turbines, the construction compound and onsite substation. These will be constructed of a graded stone and be approximately 5 m in width, or as appropriate for the ground conditions (e.g. floating roads in areas of deep peat, if required).

2.2.3 Electrical Infrastructure

Onsite underground cabling will be laid alongside the access tracks where possible, linking the turbine transformers to a site substation. The substation will likely take the form of a single storey building housing the electrical infrastructure, although certain elements may be externally located within a fenced compound.

The electrical connection to the electricity network falls under a separate consent process and will be subject to a separate environmental investigation and associated consent application, if required. As such, it will not be considered as part of the EIA for the Development.

2.2.4 Battery Storage Systems

Battery storage systems, may be included as part of the Development. Such systems are designed to complement renewable energy generation. In terms of appearance, the system would be comparable to the onsite substation.

2.2.5 Temporary Construction Compound

A temporary construction compound will be required during the construction of the Development, forming an area of hardstanding providing space for temporary welfare, parking, lay down areas and potentially concrete batching.

2.2.6 Anemometry Mast

An anemometry mast will be required for the life span of the Development, of a height similar to the hub height of the proposed wind turbines.

2.3 Development Phases

It is expectant that the construction phase of the Development will take approximately 12 to 18 months, depending on the final design. This period is weather dependant and could be affected by onsite conditions. It is envisaged that the construction programme would follow this broad outline:

- Construction of site entrance, temporary construction compound, access tracks and hardstanding areas;
- Excavation and construction of turbine foundations;
- Construction of substation;
- Excavation of cable trenches and the laying of cables;
- Erection and commissioning of turbines; and
- Reinstatement of land and removal of temporary construction compound.

It is proposed that the Development will be operational for a period of at least 25 years, following which time it is expected that the Development will be decommissioned or repowered. For the purposes of this exercise, it has been assumed that the Development will be decommissioned, as repowering will involve an additional application for planning permission and a further EIA.

Decommissioning will involve the removal of all above ground infrastructure, including the turbines themselves, transformers and substation. The turbine foundations will be ground down to 1 m below ground level and cables will be cut off 1 m below ground level and backfilled with topsoil. It is expectant that the access tracks will be left in situ for future use.

3 ENVIRONMENTAL IMPACT ASSESSMENT

EIA is an iterative assessment process with the aim of avoiding or reducing the potential effects resulting from the Development through the continual refinement of the design of the Development. These effects can occur throughout all phases of the Development from construction, through operation and during decommissioning. Any potential effects will be mitigated utilising the mitigation hierarchy of avoid, reduce, offset and compensate.

Part 1 Section 4 (2) and (3) of the EIA Regulations details what information is required to be included within the EIA Report and states:

"(2) The EIA must identify, describe and assess in an appropriate manner, in light of the circumstances relating to the proposed development, the direct and indirect significant effects of the proposed development (including, where the proposed development will have operational effects, such operational effects) on the factors specified in paragraph (3) and the interaction between those factors.

(3) The Factors are –

(a) Population and human health;

(b) Biodiversity, and in particular species and habitats protected under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora and Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds;

(c) Land, soil, water, air and climate; and

(d) Material assets, cultural heritage and the landscape".

The results of the EIA will be presented in an EIA Report, which, as prescribed in the EIA Regulations is required to include a *"description of the likely significant effects"* of the Development; effects which are not considered to be significant do not need to be described. It is therefore necessary for the scope of the EIA to be appropriately defined to ensure all significant effects are included.

3.1 Scope of EIA

The aim of the Scoping process is to identify key environmental issues at an early stage, to determine which elements of the Development are likely to result in significant effects on the environment and to establish the extent of survey and assessment required for the EIA.

This Report therefore provides details of the assessment areas which will be included within the EIA Report to meet the information requirements as set out in Schedule 4 of the EIA Regulations. These assessment areas are detailed in Sections 5 - 15 of this Report, and comprise of the following:

- Section 5: Landscape and Visual;
- Section 6: Ecology;
- Section 7: Ornithology;
- Section 8: Archaeology and Cultural Heritage;
- Section 9: Noise;
- Section 10: Traffic and Transport;
- Section 11: Hydrology and Hydrogeology;
- Section 12: Geology and Peat;
- Section 13: Land Use, Socio-Economics and Tourism;
- Section 14: Climate Change and Carbon Balance; and
- Section 15: Other Issues including Human Health and safety, Major Accidents and Disasters, Shadow Flicker, Waste, Telecommunications and Aviation.

Throughout the EIA process, effects arising during the construction, operation and decommissioning phases will be assessed and mitigation measures will be considered for each assessment area, where appropriate. These considerations will also be detailed within the EIA Report.

3.2 Approach to EIA

As stated previously, EIA is an iterative process aimed at identifying and assessing the potential effects arising as a result of a proposed development. Any effects identified will be used to inform and refine the design of the Development. Where adverse effects are identified that cannot be avoided through embedded mitigation, suitable mitigation measures to reduce or offset effects will be proposed. In addition, the EIA will be used to identify potential enhancement measures that could be applied to maximise beneficial effects.

The main steps of the EIA process are broadly summarised as follows:

- Scoping: The Scoping Opinion from the Council will be used to inform and focus the scope of the EIA on likely significant effects that could be anticipated to occur as a result of the Development;
- Baseline studies: Desk-based assessment (DBA), baseline surveys and site visits will be undertaken, where appropriate, in order to determine the baseline conditions of the environment and area that may be affected by the Development. For the purposes of the Development, preliminary baseline studies have been undertaken to inform this Report;
- Predicting and assessing effects: Potential interactions between the Development and the baseline conditions will be considered. The nature of the effects, e.g. direct or indirect; positive or negative; long, medium or short term; temporary or permanent, will be predicted and assessed. Potential cumulative effects arising from Development in conjunction with other proposed or consented developments will also be considered;
- Mitigation and assessment of residual effects: Potential effects will be avoided or reduced wherever possible through embedded mitigation. Where this is not possible, operational mitigation or other measures to reduce and/or offset significant effects will be proposed. The residual effects will then be assessed to determine any effects predicted to remain following implementation of the recommended mitigation measures; and
- Production of the EIA Report: The results of the EIA will be set out in the EIA Report.

3.2.1 Assessment Methodology

In order to assess the potential effects arising from the Development, the significance of such effects will be determined, in accordance with the requirements of the EIA Regulations. The determination of significance is based on professional judgement; however, fundamentally, the overall effect on a receptor relates to the sensitivity of the resource or receptor being affected and the magnitude of change as a result of the effect.

The assessment of effects will combine professional judgement together with consideration of the following:

- The sensitivity of the resource or receptor under consideration;
- The magnitude of the potential effect in relation to the degree of change which occurs as a result of the Development;
- The type of effect, i.e. adverse, beneficial, neutral or uncertain;
- The probability of the effect occurring, i.e. certain, likely or unlikely; and
- Whether the effect is temporary, permanent and/or reversible.

A generalised methodology for assessing significant effects is detailed below; however, each individual technical area will have a specific assessment methodology which may vary from that detailed in the following Sections.

3.2.1.1 Sensitivity of Receptors

The sensitivity of the baseline conditions, including the importance of environmental features on or near the Site or the sensitivity of potentially affected receptors, will be assessed in line with best practice guidance, legislation, statutory designations and/or professional judgement.

Table 3.1 details a general framework for determining the sensitivity of receptors. Each technical assessment will specify their own appropriate sensitivity criteria that will be applied during the EIA and details will be provided in the relevant EIA Report Chapter.

Table 3.1: Framework for Determining Sensitivity of Receptors

Sensitivity of Receptor	Definition
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or is of regional importance.
Negligible	The receptor is resistant to change and is of little environmental value.

3.2.1.2 Magnitude of Effect

The magnitude of potential effects will be identified through consideration of the Development, the degree of change to baseline conditions predicted as a result of the Development, the duration and reversibility of an effect and professional judgement, best practice guidance and legislation.

General criteria for assessing the magnitude of an effect are presented in Table 3.2. Each technical assessment will apply their own appropriate magnitude of effects criteria during the EIA, with the details provided in the relevant EIA Report Chapter.

Table 3.2: Framework for Determining Magnitude of Effects

Magnitude of Effects	Definition
High	A fundamental change to the baseline condition of the asset, leading to total loss or major alteration of character.
Medium	A material, partial loss or alteration of character.
Low	A slight, detectable, alteration of the baseline condition of the asset.
Negligible	A barely distinguishable change from baseline conditions.

If effects of zero magnitude (i.e. none / no change) are identified, this will be made clear in the assessment.

3.2.1.3 Significance of Effect

The sensitivity of the asset and the magnitude of the predicted effects will be used as a guide, in addition to professional judgement, to identify whether an effect is considered to be "significant". Table 3.3 summarises guideline criteria for assessing effects and whether these would be considered to be significant.

Table 3.3: Framework for Assessment of Effects

Magnitude of Effect	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

Effects predicted to be of major or moderate significance are considered to be 'significant' in the context of the EIA Regulations and are shaded in light grey in Table 3.3.

Zero magnitude effects upon a receptor will result in no effect, regardless of sensitivity.

3.2.2 Mitigation

Where the EIA identifies significant adverse environmental effects, mitigation measures will be proposed in order to avoid, reduce, offset or compensate those effects. These mitigation measures will likely include the movement or loss of turbines, access tracks and other infrastructure (*i.e.* embedded mitigation); or the provision of specific measures during construction and operation phases of the Development.

The extent to which mitigation or other measures are taken into account will depend on the facts of each case. In some cases, the measures may form part of the proposal, be modest in scope or so plainly and easily achievable that it will be possible to reach a conclusion that there is no likelihood of significant environmental effects. The planning authority must have regard to the information provided by the Applicant and should interpret this in both light of the precautionary principle and taking into account the degree of uncertainty in relation to the environmental impact, bearing in mind that there may be cases where the uncertainties are such that they need to be examined in the EIA.

In addition, enhancement measures may be incorporated into design of the Development to maximise environmental benefits.

3.2.3 Residual Effects

Taking cognisance of the suggested mitigation (and enhancement) measures, the predicted effects will be assessed to determine whether any residual effects remain.

3.2.4 Cumulative

At the time of writing this Report, it is known that there are operational wind farms in the vicinity of the Site, with two nearby wind farms due for determination by the Scottish Government imminently. The methodology adopted for assessing the cumulative effects of wind energy developments will be in accordance with advice from SNH[7] and the Scottish

[7] SNH (2012) Assessing the Cumulative Impact of Onshore Renewable Energy Developments [Online] Available at: https://www.nature.scot/assessing-cumulative-impact-onshore-wind-energy-developments (Accessed 26/03/2019)

Government. Cumulative effects, which are the combined effects of two or more similar developments, will be considered for each technical area assessed within the EIA.

The extent of any cumulative assessment relative to each technical assessment will be agreed during the consultation process and can include both existing and proposed wind farm developments as well as other forms of development.

3.2.5 Alternatives Sites & Design

Schedule 4, Part 2 of the EIA Regulations requires an outline of reasonable alternatives (such as technology, location, size and scale) considered and the main reasons why the Development was chosen, taking into account the environmental effects. Details of this will be provided within the EIA Report.

Consideration of alternative designs has already begun. The final layout of the Development will be based on a range of technical criteria, such as separation distances between turbines, wind speed, prevailing wind direction, topography, ground conditions, local environmental issues, forestry, and landscape and visual effects.

The identification of these criteria is an iterative process; as the understanding of these criteria is developed, the layout of the Development, including ancillary infrastructure, will undergo a series of modifications to avoid or reduce potential effects through careful design. This process will be set out in the EIA Report.

3.3 Structure and Content of the EIA Report

The content of the EIA Report will broadly follow the specifications detailed within Schedule 4 of the EIA Regulations. The EIA Report will consist of three volumes and a Non-Technical Summary (NTS).

- Volume 1 - Main EIA Report text;
- Volume 2 – Figures including landscape visualisations; and
- Volume 3 - Technical appendices.

The front end of the main EIA Report text will include:

- An introduction, including a summary of the EIA process and methodology;
- Description of the Site and its surroundings;
- Details of alternative considered and description of the Development; and
- A summary of the relevant planning policy and environmental context.

The technical Chapters of the EIA Report will present details of the assessments undertaken, including any cumulative effects, required mitigation and residual effects.

4 POLICY AND LEGISLATIVE CONTEXT

4.1 Introduction

This Section of the Report identifies the key policy documents of relevance to the Development which will be considered throughout the preparation of the Environmental Impact Assessment (EIA) Report, including key planning guidance, renewable energy policy and other material planning considerations.

It is envisaged that the documents identified within this Section will be considered in further detail during the preparation of the planning application for the Development.

4.2 Legislative Context

In Scotland, renewable energy developments that have capacity to generate up to 50 MW of electricity require consent from the Council under Section 57 of the Town and Country Planning (Scotland) Act 1997[8] as amended by the Planning etc. (Scotland) Act 2006[9] (the Planning Act).

4.3 European Context

On 14 June 2018, the European Commission, the Parliament and the Council reached a political agreement which includes a binding renewable energy target for the EU for 2030 of 32%, with a clause for an upwards revision by 2023[10]. This political agreement must now be translated into all EU languages and formally adopted by the European Parliament and the Council, and then published in the Official Journal of the EU. This agreement sets the course for a growing demand for renewable energy projects across Europe.

The 2017 Renewable Energy Progress Report[11] summarises the progress countries within the EU are making towards 2020 targets. Based on the 2017 publication, the UK is currently projected to miss its 2020 targets, indicating a need for further renewable energy developments.

On 29 March 2017, the UK formally notified its intention to leave the EU under Article 50 of the Treaty of the EU[12]. It is unclear at this moment in time whether the UK will leave the EU as initially indicated. If the UK does leave the EU, then it is anticipated that the European Union (Withdrawal) Bill 2017-19[13] will convert all EU laws, rules and targets into domestic UK governance. It is considered that the existing EU renewable energy targets for the UK, such as the requirements of the Renewable Energy Directive, will remain applicable in the event that the UK formally leaves the EU.

4.4 UK Context

The following documents set out the UK Governments binding commitments to cut carbon emissions through the deployment of renewable energy:

[8] Scottish Government (1997) Town and Country Planning (Scotland) Act 1997 [Online] Available at: http://www.legislation.gov.uk/ukpga/1997/8 (Accessed 15/03/2019)

[9] Scottish Government (2006) Planning etc. (Scotland) Act 2006 [Online] Available at: http://www.legislation.gov.uk/asp/2006/17/contents (Accessed 15/03/2019)

[10] European Commission (2018) Renewable Energy: Moving towards a low carbon economy [online] Available at: https://ec.europa.eu/energy/en/topics/renewable-energy (Accessed 15/03/2019)

[11] EUR-Lex (2017) Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Renewable Energy Progress Report [Online] Available at: http://eurlex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017DC0057&qid=1488449105433&from=EN (Accessed 15/03/2019)

[12] UK Government (2017) Prime Ministers letter to European Council President Donald Tusk [Online] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/604079/Prime_Ministers_letter_to_European_Council_President_Donald_Tusk.pdf (Accessed 15/03/2019)

[13] UK Government (2017) European Union (Withdrawal) Bill 2017-19 [Online] Available at: https://services.parliament.uk/bills/2017-19/europeanunionwithdrawal.html (Accessed 15/03/2019)

- The Climate Change Act 2008[14];
- The Clean Growth Strategy (2017) (amended 2018)[15]; and
- The Energy and Climate Change Select Committee Report (2016)[16].

In the Climate Change Act 2008, the UK Government set a binding commitment to cut the UK's carbon emissions by 80% by 2050. The Climate Change Act further requires that limits be set on the total amount of emissions in successive five-year periods (carbon budgets), with a minimum 34% reduction by 2020, against 1990 levels.

In 2011, the UK Renewable Energy Roadmap was published which reaffirms the UK Governments commitment to increasing the use of renewable energy, and outlines that the UK has the potential to meet its 2020 target of 15% of UK energy consumption from renewable resources, and deliver an operational capacity of 29 gigawatts (GW) of renewable energy by this same year.

In December 2012 and 2013, updates were issued to the UK Renewable Energy Roadmap which reiterated the commitment to achieve the renewable energy target for 2020 as set out within the 2009 EU Renewable Energy Directive. In relation to onshore wind development, the 2013 Update states that:

"*Onshore wind, as one of the most cost effective and proven renewable energy technologies, has an important part to play in a responsible and balanced UK energy policy…it remains committed to ensuring that projects are built in the right places*".

Wind energy is seen as the most significant renewable energy source for achieving these targets in the short and medium term. Wind power does not create CO2 emissions during its operational life and displaces other fuel sources generating greenhouse gas emissions.

4.5 Scottish Energy Planning Context

The following documents set out the Scottish Government's commitment to cut carbon emissions through the deployment of renewable energy, and sets out the national energy strategy alongside energy planning statistics.

4.5.1 Climate Change (Scotland) Act 2009

The Climate Change (Scotland) Act 2009[17] creates a long-term framework for the current and successive administrations in Scotland to ensure a reduction in Scottish greenhouse gas emissions by 80% by 2050 with an interim milestone of 42% by 2020.

To help ensure the delivery of these targets, the Act also requires that the Scottish Ministers set annual targets, in secondary legislation, for Scottish emissions from 2010 to 2050.

4.5.2 The Climate Change (Emissions Reduction Targets) (Scotland) Bill

The Climate Change (Emissions Reduction Targets) (Scotland) Bill was introduced in the Scottish Parliament on 23 May 2018. The Bill proposes a net-zero target for all greenhouse

[14] UK Government (2008) Climate Change Act 2008 [Online] Available at: http://www.legislation.gov.uk/ukpga/2008/27/contents (Accessed 15/03/2019)

[15] UK Government (2017) The Clean Growth Strategy: Leading the way to a low carbon future [Online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf (Accessed 27/03/2019)

[16] Energy and Climate Change Select Committee (2016) The energy revolution: preparing for the future UK energy system [Online] Available at: https://publications.parliament.uk/pa/cm201617/cmselect/cmenergy/705/70502.htm?utm_source=705&utm_medium=fullbullet&utm_campaign=modulereports (Accessed 27/03/2019)

[17] Scottish Government (2009) The Climate Change (Scotland) Act 2009 [Online] Available at: http://www.legislation.gov.uk/asp/2009/12/contents (Accessed 15/03/2019)

gas emissions and was drafted ahead of the recent report of the Intergovernmental Panel on Climate Change (IPCC) on limiting global temperature rises to 1.5°C. [18]

The Stage 1 Report identifies some of the key questions in relation to the development of the Bill and concludes that any targets should aim to meet the terms of the Paris Agreement which seeks to limit global temperature rises to 1.5°C[19].

4.5.3 2020 Routemap for Renewable Energy in Scotland

Securing low carbon energy supplies is a key element in achieving this target and in recognition of this, the Scottish Government has set further targets which include producing 100% of the country's demand for electricity from renewable sources by 2020. This is detailed within the 2020 Routemap for Renewable Energy in Scotland[20].

4.5.4 Energy Planning Statistics

As of October 2018, the total installed capacity of renewables in Scotland was 10.475 GW, of which onshore wind contributed 7.664 GW[21].

4.5.5 Scottish Energy Strategy

The Scottish Energy Strategy 2017[22]: The Future of Energy in Scotland sets out the Scottish Government's vision for the future energy system in Scotland, to 2050. It articulates the priorities for an integrated system-wide approach that considers both the use and supply of energy for heat, power and transport. The Energy Strategy is designed to strengthen the development of local energy, protect and empower consumers, and support Scotland's climate change ambitions while tackling poor energy provision.

4.5.6 Scottish Onshore Wind Policy Statement

The Onshore Wind Policy Statement[23] was published alongside the Energy Strategy in December 2017. The Statement reaffirms the Scottish Government's existing onshore wind policy set out in previous publications, whilst protecting the environment (landscape and visual, ecological and other environmental impacts); protecting residential amenity; and maximising local benefits, including through promoting shared ownership and community benefits.

The Scottish Government is determined to influence, enable and deliver a clean and integrated and reliable energy system at an affordable cost. Onshore Wind is recognised as a mature technology amongst the lowest cost forms of electricity generation. Onshore Wind is expected to remain at the centre of a clean, reliable and low carbon energy future in Scotland. In order for onshore wind to play its vital role in meeting Scotland's energy needs and a material role in growing Scotland's economy, its contribution must continue to grow. Therefore, Scotland will continue to need more onshore wind development and capacity, in locations where it can be appropriately accommodated within the landscapes.

[18] The Climate Change (Emissions Reduction Targets) (Scotland) Bill [Online] Available at: https://www.parliament.scot/parliamentarybusiness/Bills/108483.aspx (Accessed 26/03/19)
[19] Stage 1 Report on The Climate Change (Emissions Reduction Targets) (Scotland) Bill [Online] Available at: https://digitalpublications.parliament.scot/Committees/Report/ECCLR/2019/3/4/Stage-1-Report-on-the-Climate-Change--Emissions-Reduction-Targets---Scotland--Bill (Accessed 26/03/19)
[20] Scottish Government (2015) 2020 Routemap for Renewable Energy in Scotland – Update [Online] Available at: http://www.gov.scot/Resource/0048/00485407.pdf (Accessed 15/03/2019)
[21] Scottish Government (2018) Renewable Planning Statistics [online] Available at: https://www2.gov.scot/Topics/Statistics/Browse/Business/Energy/planningdata (Accessed 15/03/2019)
[22] Scottish Government (2017) Scottish Energy Strategy [online] Available at: https://www.gov.scot/energystrategy (Accessed 15/03/2019)
[23] Scottish Government (2017) Onshore Wind Policy Statement December 2017 [Online] Available at: http://www.gov.scot/Resource/0051/00513263.pdf (Accessed 15/03/2019)

4.6 Planning Policy Context

Sections 25 and 37(2) of the Planning Act require planning decisions to be made in accordance with the provisions of the Development Plan unless material considerations indicate otherwise. This Section is set out to address the Development Plan policies first, then material considerations at a regional, national and UK-wide level.

4.6.1 Statutory Development Plan

The statutory Development Plan relevant to the Site comprises:

- The Highland-wide Local Development Plan 2012 (the HwLDP)[24]; and
- The Caithness and Sutherland Local Development Plan 2018 (CaS Plan)[25].

4.6.1.1 The HwLDP

The HwLDP was adopted by the Council on 05 April 2012. Consideration must be given to relevant policies contained with the HwLDP during the design of the Development. Individual policies are not quoted in full (for full policy wording please refer to the Development Plan). The following policies are relevant to the Development:

- Policy 28 - Sustainable Design (links to Sustainable Design Guide Supplementary Guidance);
- Policy 30 - Physical Constraints;
- Policy 31 - Developer Contributions;
- Policy 36 - Wider Countryside;
- Policy 51 - Trees and Development;
- Policy 52 - Principle of Development in Woodland (safeguards trees and woodland and set out the criteria that will be taken into account when assessing development in woodland);
- Policy 53 - Minerals (may be relevant depending on where materials are sourced);
- Policy 55 - Peat and Soils;
- Policy 56 - Travel;
- Policy 57 - Natural, Built and Cultural Heritage (requires consideration of impacts on 'features', including designated sites, certain identified sites of value and wild areas. This policy considers impact on natural, built and cultural heritage designations and features);
- Policy 58 - Protected Species;
- Policy 59 - Other Important Species;
- Policy 60 - Other Important Habitats;
- Policy 61 - Landscape (underlines development proposals should relate to landscape characteristics and that cumulative effects should be taken into account);
- Policy 62 - Geodiversity;
- Policy 63 - Water Environment;
- Policy 64 - Flood Risk;
- Policy 67 - Renewable Energy Development (sets out the Council's principle of supporting appropriate renewable energy development in Highland. Particularly relevant is the visual impact on the character of the surrounding landscape. Any potential cumulative impact is recognised by the Council as an important consideration. The Development is located within an area with potential for cumulative impacts with neighbouring wind farms already in operation, under construction, permitted or proposed);

[24] The Highland Council (2012) The Highland Wide Local Development Plan [Online] Available at: https://www.highland.gov.uk/info/178/local_and_statutory_development_plans/199/highland-wide_local_development_plan (Accessed 15/03/2019)

[25] The Highland Council (2018) Caithness and Sutherland Local Development Plan [online] Available at: https://www.highland.gov.uk/downloads/file/19712/casplan_adopted (Accessed 15/03/2019)

- Policy 69 - Electricity Transmission Infrastructure;
- Policy 72 - Pollution (there is an expectation that development will follow a robust project environmental management process);
- Policy 77 - Public Access; and
- Policy 78 - Long Distance Routes.

4.6.1.2 The Caithness and Sutherland Local Development Plan

The Caithness and Sutherland Local Plan 2018 sets out the Council vision and development strategy for the area over the next 20 years and must be read in conjunction with the HwLDP. The HwLDP contains the Spatial Strategy, Vision and all general policy against which development proposals will be assessed. Where Caithness specific allocations and policy are contained in the HwLDP, these can be found in Section 17 of the HwLDP and Section 3 of the C&SLP, with the general policies found in Sections 18 to 23 (inclusive). Allocations and policy specific to Sutherland can be found in section 4 of the C&SLP. There are no Caithness or Sutherland specific allocations specific to the Development.

4.6.1.3 Supplementary Planning Guidance

In addition to the emerging plan listed above, key Supplementary Planning Guidance (SPG) relevant to the Development includes:

- Highland Renewable Energy Strategy and Planning Guidelines (2006)[26];
- Onshore Wind Energy: Supplementary Guidance (SG) (2016)[27];
- Landscape Sensitivity Appraisal: Addendum Supplementary Guidance "Part 2B" (2017)[28]; and
- Cumulative Landscape and Visual Assessment of Wind Energy in Caithness (2014)[29].

4.6.1.4 Highland Renewable Energy Strategy and Planning Guidelines (2006) (HRES)

It is understood that the HRES now provides an overarching strategy for renewable developments and has been largely superseded by the Onshore Wind Energy SG and HwLDP. The Onshore Wind Energy SG is of particular relevance to the Development and is discussed in greater detail below.

4.6.1.5 Onshore Wind Energy: SG (2016)

The Onshore Wind Energy: SG, adopted by the Council in November 2016, sets out how the Council will manage onshore wind energy development proposals. SG sets out a spatial framework for onshore wind energy development that applies to all onshore wind energy development proposals that are either:

- Individual turbines with a height of 50 m and above to blade tip; or
- More than one turbine with a height of 30 m and above to blade tip.

As such, the Development must take account of the spatial framework. The Spatial Framework for Onshore Wind Energy for Caithness and Sutherland LDP Area shows the Development is mostly sited within 'Group 2: Areas of significant protection" with small

[26] The Highland Council (2006) Highland Renewable Energy Strategy [Online] Available at: http://www.highland.gov.uk/downloads/file/1009/highland_renewable_energy_strategy_may_2006 (Accessed 15/03/2019)
[27] The Highland Council (2016) Onshore Wind Energy: Supplementary Guidance [Online] Available at: https://www.highland.gov.uk/downloads/file/16949/onshore_wind_energy_supplementary_guidance-_nov_2016 (Accessed 15/03/2019)
[28] The Highland Council (2017) Onshore Wind Energy: Addendum Supplementary Guidance [Online] Available at: https://www.highland.gov.uk/downloads/file/16949/onshore_wind_energy_supplementary_guidance-_nov_2016 (Accessed 27/03/2019)
[29] LUC (2014) Cumulative Landscape and Visual Assessment of Wind Energy in Caithness [Online] Available at: https://www.highland.gov.uk/download/meetings/id/66549/item_10_cumulative_landscape_and_visual_asssessment_of_wind_energy_in_caithness_booklet_d. (Accessed 15/03/2019)

parts of the Site located within "Group 3: Areas with potential for wind farm development". Within Group 2, wind farms may be appropriate in some circumstances. Further considerations will be required to demonstrate that any significant effects on the qualities of these areas can be substantially overcome by siting, design or other mitigation.

Within Group 3, wind farms are likely to be acceptable, subject to detailed consideration against identified policy criteria.

4.6.1.6 Landscape Sensitivity Appraisal (2017)

A landscape sensitivity appraisal was introduced as an addendum to the 2016 Onshore Wind Energy SG in December 2017. This document presents two landscape sensitivity appraisals, one for the Black Isle, Surrounding Hills and Moray Firth Coast study area and one for the Caithness study area, and contains associated strategic capacity conclusions.

4.6.1.7 Cumulative Landscape and Visual Assessment of Wind Energy in Caithness (2014)

Cumulative Landscape and Visual Assessment (CLVA) of Wind Energy in Caithness was prepared by LUC for the Council in 2014, which focuses on the analysis of cumulative landscape and visual effects arising from existing and proposed wind energy developments with a focused study area in Caithness. The CLVA study area encompasses a large area that extends beyond Caithness, including parts of Sutherland and the Orkney Islands. The Development lies within the 15 km Outer Study Area within the CLVA. The CLVA sets out criteria for assessing the landscape sensitivity and receptors for wind farm developments.

4.6.2 Material Considerations

The following documents are considered material to the determination of the Application.

4.6.2.1 National Planning Framework 3 (2014)

On 23 June 2014, the National Planning Framework 3 (NPF3)[30] was laid in the Scottish Parliament as required by statue alongside associated documentation. It is the Scottish Government's third NPF and spatial expression of the Government's Economic Strategy.

NPF3 sets the context for development planning in Scotland and a framework for spatial development of Scotland as a whole. It outlines the Scottish Government's development priorities over the next 20 - 30 years and identifies fourteen national developments. It focuses on supporting sustainable economic growth and the transition to a low carbon economy.

Strategic and local development plans are required to take NPF3 into account. Section 3 of NPF3 states: "our ambition is to achieve at least and 80% reduction in greenhouse gas emissions by 2050" (page 30).

Paragraph 3.4 highlights Scotland's wind resource and states: "we have a significant wind resource, both onshore and offshore, and electricity generation from wind continues to rise" (page 30).

NPF3 acknowledges that a planned approach to onshore wind energy development ensures that such development "largely avoids our internationally and nationally protected areas" (paragraph 3.7, page 31).

[30] Scottish Government (2014) National Planning Policy Framework [Online] Available at: http://www.gov.scot/Resource/0045/00453683.pdf (Accessed 15/03/2019)

4.6.2.2 Scottish Planning Policy (2014)

Scottish Planning Policy (SPP)[31] sets out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land. The SPP promotes consistency in the application of policy across Scotland whilst allowing sufficient flexibility to reflect local circumstances. The SPP is a material consideration in the determination process for planning applications and Section 36 applications.

SPP is a non-statutory document which sets out the Scottish Government's policy on land use planning and therefore should be afforded significant weight in the determination process for planning applications; however, paragraph (iii) of SPP acknowledges that "it is for the decision-maker to determine the appropriate weight in each case".

Paragraphs 24 to 35 reaffirm the Scottish Government's commitment to "Sustainability".

Paragraphs 152 to 192, under the heading "A Low Carbon Place", detail how the Scottish planning system will contribute towards delivering a low carbon economy, specifically through the development of electricity generation technologies which will help contribute to reducing greenhouse gas emissions. Paragraphs 161 to 166 deal solely with onshore wind development.

The SPP sits alongside other key Scottish Government documents including the NPF3 and Circulars.

4.6.2.3 Delivering for Today, Investing for Tomorrow – The Scottish Government's Programme 2018-19[32]

In September 2018, the Scottish Government published the Government's Programme 2018-19 which sets out the actions the Government will take in the forthcoming year. The Programme reiterates the continuous support for Renewable Energy development, as a way of achieving greater CO2 emission reduction and adaptation to climate change. The Programme states that the Government will continue to work with industry to encourage investment in key industrial areas where energy efficiency, renewables, bio-technology and carbon capture utilisation and storage could offer significant opportunities for decarbonisation and economic growth.

4.6.2.4 Low Carbon Scotland: Climate Change Plan – Third Report on Proposals and Policies 2018-2032 (2018)[33]

This document was published in September 2018 and provides an overview of the Scottish Government's climate change plan 2018-2032. The document contains the most up-to-date renewable electricity generation data available from UK BEIS.

"*In 2015, Scotland had reduced its emission by 41% from the 1990 baseline, and in 2017 Scotland generated 68.1% of its electricity requirements from renewables. Scotland's success in decarbonising electricity paves the way for transformational change across all sectors of the economy and society, particularly as electricity will be increasingly important as a power source for heat and transport.*"

The plan envisages that by 2032 Scotland will have reduced its emissions by 66%, relative to the baseline, while growing the economy, increasing the wellbeing of the people of Scotland and protecting and enhancing the natural environment. Further, the plan proposes

[31] Scottish Government (2014) Scottish Planning Policy [Online] Available at: http://www.gov.scot/Resource/0045/00453827.pdf (Accessed 15/03/2019)

[32] Scottish Government (2018) Government's Programme 2018-19 [online] Available at: https://www.gov.scot/programme-for-government/ (Accessed 15/03/2019)

[33] Scottish Government (2018) Low Carbon Scotland: Climate Change Plan 2018 – 2032 [online] Available at: http://www.low-carbonscotland.scot/wp-content/uploads/2018/11/Climate-Change-Plan-Scotland.pdf (Accessed 15/03/2019)

that by 2032 Scotland's electricity system will be largely decarbonised and increasingly important as a power source for heat and transport.

4.6.2.5 Planning Advice Notes (PANs) and Specific Advice Sheets

- PANs and Specific Advice Sheets[34] set out detailed advice from the Scottish Government in relation to a number of planning issues, and include:
- PAN 51: Planning, Environmental Protection and Regulation (2006);
- PAN 60: Planning for Natural Heritage;
- PAN 61: Planning and Sustainable Urban Drainage Systems (2001);
- PAN 65: Planning and Open Space;
- PAN 68: Design Statements;
- PAN 73: Rural Diversification;
- PAN 75: Planning for Transport;
- PAN 79: Water and Drainage (currently being consolidated);
- PAN 3/2010: Community Engagement;
- PAN 1/2011: Planning and Noise;
- PAN 2/2011: Planning and Archaeology;
- PAN 1/2013: Environmental Impact Assessment; and
- Online Renewables Planning Advice- Onshore Wind Turbines 2014.

4.6.3 Other Material Considerations

The following documents form material considerations to the planning application:

- Reducing emissions in Scotland: 2016 progress report[35];
- Draft Climate Change Plan (2017)[36];
- Low Carbon Scotland: Meeting the Emissions Reduction Targets 2013 - 2027: The Second Report on Proposals and Policies (2013)[37];
- Electricity Generation Policy Statement (2013) (EGPS)[38];
- Renewables Action Plan (Updated March 2011)[39];
- A Low Carbon Economic Strategy for Scotland (November 2010)[40]; and
- SNH Strategic Locational Guidance for Onshore Wind Farms (March 2009)[41].

4.6.4 Policy within EIA Report

A Planning Policy section is not required within the EIA Report by the EIA Regulations. The purpose of an EIA is not to assess the compliance with the development plan policy but to assess and protect the environmental by ensuring the decision maker, in this case the Council, when deciding to grant planning permission for a project, does so in the full

[34] All the above referenced PANs and Advice sheets are available online at the Scottish Government website [Online] Available at: http://www.gov.scot/Topics/Built-environment/planning/publications/pans (Accessed 15/03/2019)

[35] Committee on Climate Change (2016). Reducing emissions in Scotland 2016 progress report [Online] Available at: https://www.theccc.org.uk/wp-content/uploads/2016/09/Reducing-emissions-in-Scotland-2016-Progress-Report-Committee-on-Climate-Change.pdf (Accessed 15/03/2019)

[36] Scottish Government (2017) Draft Climate Change Plan (the draft third report on policies and proposals 2017 – 2032) [Online] Available at: http://www.gov.scot/Resource/0051/00513102.pdf (Accessed 15/03/2019)

[37] The Scottish Government (2013) Low Carbon Scotland: Meeting our Emissions Reduction Targets 2013-2027: the Draft Second Report on Proposals and Policies [Online] Available at: http://www.gov.scot/Resource/0041/00413150.pdf (Accessed 01/11/17)

[38] The Scottish Government (2013) Electricity Generation Policy Statement [Online] Available at: http://www.scotland.gov.uk/Resource/0042/00427293.pdf (Accessed 15/03/2019)

[39] The Scottish Government (2011) Renewables Action Plan: Update [Online] Available at: http://www.scotland.gov.uk/Resource/Doc/917/0115603.pdf (Accessed 15/03/2019)

[40] The Scottish Government (2010) A Low Carbon Economic Strategy for Scotland [Online] Available at: http://www.scotland.gov.uk/Resource/Doc/331364/0107855.pdf (Accessed 15/03/2019)

[41] Scottish Natural Heritage (2009) Strategic Locational Guidance for Onshore Wind Farms in Respect of the Natural Heritage [Online] Available at: http://www.snh.gov.uk/docs/A247182.pdf (Accessed 15/03/2019)

knowledge of the likely significant effects, and takes this into account in the decision-making process.

A Planning Policy Chapter identifying the key policy documents of relevance to the Development will be not be included in the EIA Report but will be set out in full in the planning statement that will accompany the planning application.

Local and national policy, where relevant to the assessment of likely significant effects, will be set out in the technical chapters of the EIA Report. For example, where policy identifies that an environmental aspect, such as a particular habitat or landscape component, is of particular value, this will be taken into account, typically in consideration of its sensitivity to change, when assessing the significance of effects. This is different to assessing the compliance of the Development with policies that set out how decisions on development consent should be made.

4.6.5 Summary

The above policies and plans reflect the current direction of the UK and Scottish Government's objectives for accommodating wind turbine development.

In the context of findings of the Development, a Planning Statement would accompany the Application to undertake an in-depth appraisal of the Development to assess its compliance with relevant planning policies, but it is not proposed to include a specific chapter on planning policy within the EIA Report.

5 LANDSCAPE AND VISUAL

5.1 Introduction

The Site is located on the north coast of Scotland, close to the A836, such that key landscape and visual receptors will be people living, visiting or travelling along the north coast.

The Landscape and Visual Impact Assessment (LVIA) will describe the existing baseline landscape and visual receptors likely to be affected by the Development. The susceptibility of landscape and visual receptors to change from the Development and the magnitude or nature of such change will be assessed. The relative importance or significance of effects will be described and assessed, and photomontages of the Development from agreed viewpoints will be produced. The LVIA will be undertaken by a suitably qualified and experienced Chartered Landscape Architect at MVGLA.

5.2 Study Area

The initial study area for the LVIA will be 40 km from the outermost turbines of the Development, as advised by SNH guidance[42], but focussed on potential and likely significant effects to those landscape and visual receptors within approximately 15-20 km. A number of more distant viewpoints will be included to illustrate visibility of the Development. A Zone of Theoretical Visibility (ZTV) to 40 km from the Development is shown in Figure 5.1 showing the potential visibility of the turbine tips of the Development based on bare-ground landform and topography. The ZTV illustrates that visibility is generally within approximately 25 km of the Site, and this will be used to enable a focussed assessment that considers potential significant landscape and visual effects. Figure 5.2 shows the ZTV to a 20 km radius.

5.3 Assessment Methodology

The LVIA will be carried out in accordance with current guidance, i.e. *Guidelines for Landscape and Visual Impact Assessment* (3rd edition, 2013, referred to as GLVIA3[43]). Maps and visualisations will be produced in accordance with Scottish Natural Heritage guidance (2017[44]) and The Highland Council Visualisation Standards (2017[45]).

5.3.1 Consultation

The consultees below will be approached for information to inform the LVIA and Cumulative assessment:

- The Council; and
- SNH.

5.3.2 Landscape Effects

Predicted changes in both the physical landscape and landscape character will be identified. Effects will be considered in terms of the magnitude and type of change to the landscape, including its key characteristics as set out in published landscape character assessments. The sensitivity of the landscape will also be taken into account, acknowledging value placed

[42] SNH (2017) Visual Representation of Wind Farms, Version 2.2 [Online] Available at: https://www.nature.scot/visual-representation-wind-farms-version-22-february-2017 (Accessed 26/03/2019)

[43] Landscape Institute and the Institute of Environmental Management & Assessment (2013) *Guidelines for Landscape and Visual Impact Assessment* (Third Edition)

[44] SNH (2017) Visual Representation of Wind Farms, Version 2.2[Online] Available at: https://www.nature.scot/visual-representation-wind-farms-version-22-february-2017 (Accessed 26/03/2019)..

[45] The Highland Council (2016) Visualisation Standards for Wind Energy Developments [Online] Available at: https://www.highland.gov.uk/downloads/file/12880/visualisation_standards_for_wind_energy_developments (Accessed 26/03/2019)

on the landscape through designation as well as the presence of other consented and operational wind farms. The magnitude of the effect will be assessed in terms of the size and scale, geographical extent, duration and reversibility of the effect. These aspects will all be considered, to form a judgement regarding the overall significance of effect.

5.3.3 Visual Effects

Visual effects are experienced by people at different locations around the study area, at static locations (for example settlements or viewpoints) and from sequential locations when travelling along routes. Visual receptors are the people who will be affected by changes in views at these places, and they are usually grouped by what they are doing at those places (for example residents, motorists, recreational users etc.). Assessment of the visual effects of the Development will be based on analysis of the ZTVs, field studies and assessment of representative viewpoints.

GLVIA3 states that the nature of visual receptors, commonly referred to as their sensitivity, should be assessed in terms of the susceptibility of the receptor to change in views/visual amenity and the value attached to particular views. The magnitude of the effect will be assessed in terms of the size and scale, geographical extent, duration and reversibility of the effect. These aspects will all be considered in forming a judgement regarding the overall significance of effect.

5.3.4 Significance of Effects

Significance of landscape and visual effects, considering receptor sensitivity and the magnitude of change as set out above, will identify the level of effect using four categories: major, moderate, minor, and negligible. Major and moderate effects will be considered to be significant.

5.3.5 Cumulative Assessment Methodology

The LVIA will consider operational wind farms and wind farms under construction as part of the existing baseline. A cumulative landscape and visual assessment (CLVIA) will be undertaken with consideration of other wind farms which are consented or have undetermined applications or appeals, in addition to the wind farms that form part of the existing baseline. Cumulative wind farm information will be gathered for all wind farms within 40 km radius of the Development, but the CLVIA will focus on wind farms with which there will be cumulative relationships which may give rise to significant effects (likely to be those within approximately 20 km or visible from key sequential routes). Schemes at scoping stage within 5 km will only be included at the reasonable request of the Council and SNH, and if sufficient information is available to make an informed assessment. Turbines below 50 m to blade tip height will not be included in the assessment.

The list of wind farms for inclusion in the cumulative assessment will be drawn up during the assessment process, so as to be as up-to-date as possible at the time of submission. Sources for the list will include the local authority planning portal website and direct consultation with the Council and SNH.

The intervisibility of the Development with other wind farms in the surrounding area will be illustrated using combined ZTV maps, using ZTVs of each wind farm overlain on a base map. Paired ZTVs will be prepared to illustrate the key relationships between the Development and other wind farms close to the site. The combined ZTVs will be colour coded to distinguish between areas where the Development is predicted to be visible (either on its own, or in conjunction with other wind farm schemes), and areas where other wind

farms are visible but the Development is not. Visualisations will include cumulative schemes in accordance with SNH guidance[46] and Council guidance[47].

The cumulative landscape and visual assessment will be carried out in accordance with the principles contained in SNH guidance on cumulative assessment (2012[48]). Cumulative relationships will be assessed with a series of scenarios, considering different levels of likelihood:

- Scenario 1: is the LVIA, with all operational wind farms and those under construction;
- Scenario 2: consented wind farms in addition to those in scenario 1;
- Scenario 3: wind farm proposals (submitted to planning) with undetermined applications or appeals in addition to those in scenario 2; and
- A fourth scenario may be used to consider cumulative effects with wind farm proposals at scoping stage within 5 km (if required and sufficient information is available).

Cumulative visual effects will be assessed through analysis of combined ZTVs, views from individual viewpoints and sequential views from routes. The magnitude of cumulative change to landscape character is the additional influence the Development has on the characteristics and character of the landscape type assuming the other wind farm schemes are already present.

5.3.6 Mitigation

The primary form of mitigation for landscape and visual effects, including cumulative effects, is through iterative design of the layout of the turbines and associated infrastructure, as seen from key viewpoints and routes. The process and justification for design development will be set out in detail in the Design Strategy that will form part of the EIA Report.

5.4 Baseline Conditions

5.4.1 Landscape Character

The Caithness and Sutherland Landscape Character Assessment[49] identifies the Site as being of the *Sweeping Moorland* landscape character type (LCT), characterised by wide open space and the simple visual composition of undulating moorland. In this LCT, infrastructure, such as power lines and roads, is visible due to the openness of the surroundings, and extensive coniferous plantations dominate some areas. Generally, the landscape can be described as large scale with limited development and man-made features.

Further east, the landscape is more enclosed, in active agricultural use and more settled, with shelter belts, farmsteads, a road network and rectilinear field pattern set out with distinctive Caithness slab fences (*Mixed Agriculture and Settlement* LCT). Baillie and Forss Wind Farms have a presence in this area, as does the Dounreay nuclear plant. The

[46] SNH (2017) Visual Representation of Wind Farms, Version 2.2, [Online] Available at: https://www.highland.gov.uk/downloads/file/12880/visualisation_standards_for_wind_energy_developments (Accessed 26/03/2019)

[47] The Highland Council (2016) Visualisation Standards for Wind Energy Developments [Online] Available at: https://www.highland.gov.uk/downloads/file/12880/visualisation_standards_for_wind_energy_developments (Accessed 26/03/2019)

[48] SNH, (2012). Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments [Online] Available at: https://www.nature.scot/assessing-cumulative-impact-onshore-wind-energy-developments (Accessed 26/03/2019)

[49] Scottish Natural Heritage (1998) Caithness and Sutherland Landscape Character Assessment [Online] Available at: https://www.nature.scot/sites/default/files/2018-01/Publication%201998%20-%20SNH%20Review%20103%20-%20Caithness%20and%20Sutherland%20landscape%20character%20assessment.pdf (Accessed 26/03/2019)

landscape is generally of smaller scale, albeit largely flat and with few woodlands to contain views.

Further west of the site, Strath Halladale (*Strath* LCT) interrupts the *Sweeping Moorland* LCT, comprising a settled valley with broadleaf woodland and enclosed fields on the valley slopes below the level of the surrounding moorland. *Sweeping Moorland* continues beyond and when set back from Strath Halladale, the strath is not visible. Beyond the strath, large scale moorland continues, but there are extensive areas of forest, and the operational Strathy North Wind Farm. Distant lone mountains form the backdrop in clear visibility.

LCTs across the study area are shown in Figure 5.3. As significant changes to character of landscape do not generally occur beyond approximately 10-15 km, at which distance wind farms form a more distant feature in the backdrop to local landscapes, it is proposed that the assessment of landscape effects will focus on potential significant effects on landscape character within approximately 15 km from the Development.

SNH published updated landscape character assessment data in March 2019[50], which is shown on Figure 5.4. The updated LCT areas are somewhat simplified as some of the smaller LCA areas are not picked out. In the area around the Site, the main changes to the LCT data are:

- The Sweeping Moorland and Flat Peatland LCTs are combined to Sweeping Moorland and Flows LCT;
- Open Intensive Farming areas have been merged with Mixed Agriculture and Settlement
- Forested areas and small inland lochs have not been picked out; and
- An area to the west of Strathy Forest has been reclassified as Rocky Hills and Moorland.

5.4.1.1 Designated Landscapes

The Site is not covered by any statutorily or nationally protected landscape-based planning designations that would protect the quality or scenic value of the landscape. There are, however, several designated areas within 15-20 km that will be considered in the detailed assessment. Designated landscapes within approximately 25 km are listed below and shown on Figure 5.3.

- Farr Bay, Strathy and Portskerra Special Landscape Area (SLA), 3.5 km to the west;
- Kyle of Tongue National Scenic Area, 20 km to the west at its closest point;
- Bens Griam and Loch nan Clar SLA, 21 km to the south-west;
- The Flow Country and Berriedale Coast SLA, 22 km to the south-east; and
- Dunnet Head SLA, 27 km to the east.

5.4.1.2 Wild Land

In addition to the designated landscapes listed above, SNH has identified Wild Land Areas (WLAs) across Scotland[51], two of which lie within approximately 20 km of the Site, as shown in Figure 5.3. These are:

- WLA 39 East Halladale Flows, 1.5 km south of the site at its closest point; and
- WLA 36 Causeymire – Knockfin Flows, 19 km south.

[50] Scottish Natural Heritage (March 2019) Scottish Landscape Character Types map and descriptions [Online] Available at: https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions

[51] Scottish Natural Heritage (2014) Wild Land Areas [Online] Available at: https://www.nature.scot/wild-land-area-descriptions (Accessed 26/03/2019)

An assessment of effects on wild land will be undertaken, considering the wild land qualities of both WLA 39 and WLA 36.

5.4.2 Visual Receptors

The ZTV in Figures 5.1 and 5.2 indicates where the turbines of the Development (scoping layout) will theoretically be visible. Visual receptors are people, and the LVIA will consider the visual effects of the Development on views seen by people from static viewpoints, settlements and from routes (sequential views), including from the following locations:

- Settlements within approximately 10 km of the site with theoretical visibility, such as Melvich, Portskerra, Strathy, Achiemore, and Reay;
- The main A836 which is the North Coast 500 (NC500) tourist route and the A897 along Strath Halladale within approximately 20 km;
- Minor roads including the Thurso – Westfield – Shebster – Reay route which is part of the National Cycle Route NCN1 within approximately 15 km; and
- Local paths within approximately 5 km of the site, including core paths around Reay, Melvich, Portskerra and Strath Halladale[52].

5.4.2.1 Viewpoint Locations

Figures 5.1 and 5.2 show the ZTV of the scoping layout with proposed representative assessment viewpoint locations. These have been selected to provide a representative range of viewing distances and viewing experiences, including views from settlements, points of interest and sequential views along routes. These viewpoints respond to the range of issues influencing viewpoint selection as set out in GLVIA3 and SNH guidance[53]. The list of proposed viewpoints for the assessment is set out in the table below. Several of the selected viewpoints have been used for other wind farm assessments, and all viewpoints can be used for the cumulative assessment.

Table 5.1: Potential Viewpoint Locations

VP No.	Viewpoint Name	Easting	Northing	Distance from Site Boundary (km)	Reasons for selection
1	A836 Forss	305650	969400	14.6	Representing one of the first views when leaving Thurso, part of a sequence along the A836, and cumulative effects.
2	A836 Dounreay	299680	966930	8.2	Part of a sequence along the A836, and for the assessment of cumulative effects.
3	A836 Reay	296600	964830	4.5	Representing views from Reay settlement, views from the Golf Course and Church, and part of the sequence along the A836.
4	A836 Layby	290270	964090	965m	Part of a sequence along the A836, and representing close-up views from the closest stretch of road to the site.
5	A836 Melvich	288870	963930	2	Part of a sequence along the A836, and representing views from the settlement of Reay as well as landscape character transition from Strath to Sweeping Moorland.

[52] Core paths are currently being reviewed for the Sutherland and Caithness areas, but can be accessed Online via https://www.highland.gov.uk/corepathplans (Accessed 26/03/2019)

[53] SNH (2017) Visual Representation of Wind Farms, [Online] Available at: https://www.nature.scot/sites/default/files/2017-07/A2203860%20-%20Visual%20representation%20of%20wind%20farms%20-%20Guidance%20-%20Feb%202017.pdf (Accessed 26/03/2019)

VP No.	Viewpoint Name	Easting	Northing	Distance from Site Boundary (km)	Reasons for selection
6	Portskerra	287630	965640	3.9	A location within the settlement, selected for the assessment of views from the settlement, as well as representing views from the A836 (part of a sequence), and from the coastal core path (albeit this is elevated above the coast path).
7	Strathy Point	282825	968590	9.5	Representing views from Strathy Point (visitor location) as well as views from properties along the road from the A836. May be referred to as part of the assessment of effects on the sequential experience of the A836.
8	Strath Halladale, Calgarry	290000	959250	3.2	Representing views from along the A897 as well as properties and the core path within Strath Halladale. To be used for the assessment of effects on the landscape character of the strath.
9	Beinn Ratha	294950	960940	2.9	Isolated hill inland of the coast and within the Wild Land Area. To be used for landscape, wild land, and cumulative assessments as well as representing elevated views seen by walkers on this hill top.
10	Hill of Shebster	301190	964425	8.8	Low hill inland of the coast in a more settled area. To be used for landscape, and cumulative assessments as well as representing views from local residences (albeit elevated).
11	Dunnet Head	320285	976500	30	Representing views from Dunnet Head as a key visitor location. Also representing longer distance views along the coast for cumulative assessment.
12	A9 Georgemas station	315565	959315	23.2	At a transport network junction inland of the coast within the settled lowlands of Caithness. Representing views from the A9 and A882, the railway and from Hallkirk and scattered residences.
13	Ben Dorrery	306290	955040	15.7	Isolated inland hill close to the Wild Land Area. To be used for landscape, wild land, and cumulative assessments as well as representing elevated views seen by walkers on this hill top.
14	A897 Forsinard	289150	945920	19.5	Representing views from within Strath Halladale and on the A897 (sequential views), as well as long distance views from the south.
15	Ben Griam Beg	283180	941165	22.6	Isolated inland hill. To be used for landscape assessment as well as representing elevated views seen by walkers on this hill top.
16	A836 Cnoc Craggie	261095	953085	31.3	Representing distant views from the west, as well as views from the A836.

5.4.2.2 Residential Visual Amenity Assessment

A Residential Visual Amenity Assessment (RVAA) will be undertaken for properties within approximately 2 km of the Development. The Landscape Institute has recently issued guidelines for RVAA[54], which form the first published guidance on RVAA. These guidelines will be used to inform the assessment.

The RVAA will include properties (or property groups) considered in the LVIA to experience a high or moderate magnitude of visual change and will evaluate the potential effects on the visual component of residential amenity or 'living conditions'. The visibility of existing wind farms and those under construction will be taken into account as part of the existing baseline.

5.5 Key Sensitivities

Landscape sensitivities arise from the alteration of landscape character. More sensitive landscape areas generally include designated landscapes or areas valued for their lack of development and/or wildness and scenic qualities. The focus of the assessment will be upon the effect of turbines within these areas. The landscape character assessment will focus upon a 15 km study area, as significant effects are unlikely beyond this radius.

Visual sensitivities arise at locations where people will have regular and sustained visibility of the Development. This will include residents at their homes and their routes taken on a daily basis, as well as routes along which people move through the landscape with the express purpose of enjoying views. A selection of viewpoints has been included to assess the sensitivity of visual receptors and the magnitude of change that may be received as a result of the Development.

Cumulative sensitivities will focus upon the ability of the landscape to accommodate the Development along with other operational, under construction, consented, and in planning wind farm developments. The Drum Hollistan Wind Farm site is located adjacent to the north of the Development, and the decision on it, along with Limekiln Wind Farm, will influence the final design of the Development.

5.6 Potential Effects and Assessment

The selection of receptors to include in the assessment is based on the requirement for EIA to consider the likely significant effects. Effects that are not likely to be significant do not require assessing under the EIA Regulations.

5.6.1 Scoped In Effects

Based on baseline conditions, it is proposed the following receptors are scoped into the assessment:

- Landscape effects on landscape character within approximately 15 km;
- Designated landscapes areas within approximately 20 km;
- Effects upon wild land within approximately 15 km;
- Visual receptors at settlements within approximately 10 km of the Site with theoretical visibility;
- Visual receptors using the main A836 which is the NC500 tourist route and the A897 along Strath Halladale within approximately 20 km;
- Visual receptors using the minor roads including the Thurso – Westfield – Shebster – Reay route which is part of the National Cycle Route NCN1 within approximately 15 km;

[54] Landscape Institute (March 2019) Residential Visual Amenity Assessment (RVAA), Technical Guidance Note 2/19. [Online] Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/03/tgn-02-2019-rvaa.pdf (Accessed 26/03/2019)

- Visual receptors using the local paths within approximately 5 km of the site;
- Residential Visual Amenity at properties within 2 km; and
- The CLVIA will focus on wind farms within approximately 20 km or visible from key sequential routes.

5.6.2 Scoped Out Effects

Based on the baseline conditions recorded and distance from the Site, it is proposed that the following are scoped out:

- Landscape Character Areas beyond 15 km radius;
- Landscape Planning Designations beyond 20 km radius;
- Settlements beyond 10 km;
- Local paths beyond 5 km;
- Residential properties beyond 2 km;
- Scoping schemes (unless within 5 km and specifically required by consultees) as part of the CLVIA, and
- CLVIA consideration of turbines below 50 m to blade tip height.

5.7 Key Questions for Council / Consultees

Key questions for consultees are:

- Can it be confirmed that a 40 km study area for the LVIA is considered to be appropriate starting point for the LVIA, but that 20 km is suitable for the detailed assessment of likely significant effects on landscape and visual amenity?
- Can it be confirmed that GLVIA3 is an appropriate methodological starting point for the LVIA assessment?
- Can it be confirmed that this approach to the methodology and inclusion of schemes for the cumulative assessment is considered to be appropriate?
- Is a 15 km study area for landscape effects considered to be appropriate?
- Can it be confirmed that the 2019 SNH landscape character types are to be used as superseding the 1998 assessment?
- Is it appropriate for the LVIA to consider the effects of the development on landscapes within designated areas up to 20 km from the Development?
- Can it be confirmed that this approach to the consideration of effects on Wild Land is appropriate?
- Can it be confirmed that the proposed visual receptors including viewpoints set out above are appropriate and sufficient to inform the visual assessment?
- Is the proposed study area and approach to the RVAA set out above considered to be appropriate?
- Are there any other relevant consultees who should be consulted about the LVIA process?

6 ECOLOGY

6.1 Introduction

This Section sets out the approach to the evaluation of the ecological interests making use of the Site and surrounding area and to the assessment of potential impacts on ecology throughout the construction, operation and decommissioning phases of the Development.

6.2 Assessment Methodology

The assessment of ecological impacts will follow the guidance document produced by the Chartered Institute of Ecology and Environmental Management (CIEEM)[55] ensuring a transparent and scientifically rigorous approach to Ecological Impact Assessment (EcIA). These guidelines set out the process for assessment through the following:

- Collation of baseline ecological information through desk study and field surveys (see Section 6.3.2);
- Identification and characterisation of Important Ecological Features (IEFs);
- Incorporation of imbedded mitigation measures such as mitigation by design and mitigation by practice;
- Identification and characterisation of ecological impacts from all phases of the Development;
- Assessment of significance of effects ahead of and following application mitigation hierarchy;
- Incorporation of measures to mitigate identified potential effects;
- Assessment of significance of cumulative effects;
- Identification of appropriate compensation to offset significant residual impacts; and
- Identification of opportunities for ecological enhancement.

6.2.1 Determining Importance

Upon identification of the likely effects, a systematic assessment of IEFs will be carried out. In accordance with CIEEM guidance, the importance of an ecological feature is considered within a defined geographical context.

The determination will be site specific; however, habitats and species of nature conservation importance identified through statutory policy and legislation will provide a starting point for the identification of IEFs that require consideration in the EcIA. Expert judgment is also required for the identification of IEFs, particularly where these may not be included in lists, designated sites or features, or highlighted in nature conservation policy. Only ecological features with at least regional importance are considered as IEFs and will require assessment for potential significant effects. All other features are scoped out of the assessment with justification for exclusion provided.

6.2.2 Assessment of Significance

Within this assessment, the significance of the potential effects on each identified IEF is determined by considering both the nature conservation importance of each feature and the degree to which it may be affected (the effect magnitude) by the Development as well as consideration of embedded mitigation.

For the purpose of this assessment, an effect determined to be significant at international, national or regional level, is considered to be a 'significant effect'. An effect determined to be significant at a local or less that local level will be considered to be a 'non-significant effect'.

[55] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester

6.2.3 Mitigation, Residual Effects and Cumulative Effects

The assessment will include proposals to mitigate potentially adverse effects and will include measures to increase biodiversity in the area where possible, such as habitat restoration and management. Mitigation will be identified where the assessment indicates that there is a potential significant impact on important habitats and species as a consequence of the Development. Following the application of mitigation, an assessment of residual effects will be carried out to determine whether effects remain 'significant'. Potential cumulative ecological effects with other nearby developments will also be addressed.

6.3 Baseline Conditions

6.3.1 Desk-based Study

To supplement the baseline survey data (see Baseline Surveys in Section 6.3.3), a desk-based study was undertaken to obtain information on important ecological features present within the vicinity of the Site. In addition, statutory sites designated for ecological interests that could have potential connectivity with the Site have been identified, as detailed below.

6.3.1.1 Statutory Designated Sites

The following statutory sites designated for ecological features within 5 km of the Site were identified using the SNH 'Sitelink' website[56]:

- Sites of European importance:
  - Special Areas Conservation (SACs); and
  - Ramsar Sites.
- Sites of national importance:
  - Sites of Special Scientific Interest (SSSIs).

One statutory site of European importance was identified within 5 km of the Site, which is designated for multiple ecological interests. A further five sites of national importance were identified within 5 km of the Site (extended to 10 km for bat species). Information relating to these statutory sites is summarised in Table 6.1, below, and locations are shown in Figure 6.1.

Table 6.1: Summary of Statutory Sites of International and National Importance, Designated for Ecological Interest

Site name	Designation	Qualifying Ecological Interests	Proximity to the Site
Sites of European Importance			
Caithness and Sutherland Peatlands	SAC	• Acid peat-stained lakes and ponds • Blanket bog • Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels • Depressions on peat substrates • Marsh saxifrage (*Saxifraga hirculus*) • Otter (*Lutra lutra*) • Very wet mires often identified by an unstable 'quaking' surface • Wet heathland with cross-leaved heath	Adjacent to southeast

[56] SNH (2019) SNH Sitelink [Online] Available at: https://sitelink.nature.scot/home (Accessed 26/03/2019)

Site name	Designation	Qualifying Ecological Interests	Proximity to the Site
	Ramsar site	• Blanket bog	
Sites of National Importance			
East Halladale	SSSI	• Blanket Bog	Adjacent to southeast
Strathy Coast	SSSI	• Machair • Maritime cliff • Saltmarsh • Sand dunes • Vascular plant assemblage	950 m west
Red Point Coast	SSSI	• Maritime cliff • Scottish primrose (*Primula scotica*)	1.5 km north
West Halladale	SSSI	• Blanket Bog	2.7 km to southwest
Sandside Bay	SSSI	• Sand dunes	3.25 km northeast

6.3.2 Recent Ecological Records

A summary of publicly available biological records[57] is presented in Table 6.2 and includes recent records (within 20 years) of internationally and nationally protected species within 5 km of the Site as well as records of invasive, non-native species within 2 km of the Site.

Table 6.2: Recent Protected Species Records within 5 km of the Site (10 km for bats)

Species	Conservation Value	Records
0-5 km from Site		
Otter (*Lutra lutra*)	European Protected Species[58]	4 records (2006) 9 records (2011)
Water vole (*Arvicola amphibius*)	Nationally Protected Species[59]	1 record (2005) 3 records (2006) 1 record (2008)
5-10 km from Site		
Common Pipistrelle (*Pipistrellus pipistrellus*)	European Protected Species[58]	2 records (2006) 1 record (2014)

No non-native invasive species were recorded within 2 km of the Site.

6.3.3 Baseline Surveys Completed to Date

6.3.3.1 Extended Phase 1 Habitat Survey

An Extended Phase 1 Habitat Survey was undertaken in August 2018 by Avian Ecology within up to 250 m of the Site (the Phase 1 Survey Area), as detailed in the full report within Appendix C. The survey was undertaken in accordance with Joint Nature

[57] National Biodiversity Network (2019) NBN Network Atlas Scotland [Online] Available at: https://scotland.nbnatlas.org/ (Accessed 26/03/2019)

[58] Fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

[59] Protected Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

Conservation Committee (JNCC) Phase 1 Habitat Methodology[60] and was extended to include the additional recording of specific features indicating the presence, or likely presence, of protected or notable fauna species.

The dominant habitat recorded on Site was blanket bog and wet heath as well as areas of coniferous plantation woodland. Blanket bog was largely recorded on level ground in areas of deeper peat (> 50 cm depth) whereas the areas of wet heath were predominantly recorded on shallower peat and greater inclines, though there is some overlap. To the north of the Phase 1 Survey Area, blanket bog habitats were highly degraded, with low species diversity, overly dominated by grass species with patches of bare ground.

Areas of woodland habitat were located within the west of the Survey Area and were established on former areas of blanket mire. Woodlands consisted entirely of Sitka spruce (*Picea sitchensis*) or Scots pine (*Pinus sylvestris*), with one small area of rowan (*Sorbus aucuparia*) woodland which may be semi-natural. Additionally, a mosaic of degraded blanket mire, semi-improved grasslands, scrub and two areas of quarry and cleared ground were recorded in the west part of the Phase 1 Survey Area.

Two main burns ran through the Phase 1 Survey Area; Giligill burn and Akran Burn. The Giligill burn ran mainly through the east and north of the Site from its source located within the centre of the blanket mire within the Site. Akran burn is located in the south of Phase 1 the Survey Area and is substantially wider and faster flowing than Giligill burn and passes through the far southwest of the Site.

The following Phase 1 Habitat types were recorded within the Phase 1 Survey Area (Appendix C):

- Broad-leaved semi-natural woodland (A1.1.1);
- Coniferous woodland plantation (A1.2.2);
- Mixed woodland plantation (A1.3.2);
- Dense scrub (A2.1);
- Semi-improved acid grassland (B1.2);
- Continuous bracken (C1.1);
- Scattered bracken (C1.2);
- Wet dwarf shrub heath (D2);
- Blanket bog (E1.6.1);
- Wet modified bog (E1.7);
- Acid/neutral flush (E2.1);

Other habitats recorded included quarry (I2.1); buildings (J3.6); standing water (G1); running water (G2); fence (J2.4); and wall (J2.5).

No signs of protected species were found, although the watercourses and Caol Loch have potential for otter and possibly water vole. No bat roost potential was found, although the farm buildings in the southwest of the Phase 1 Survey Area may provide some opportunities.

6.3.3.2 National Vegetation Classification (NVC) Survey

An NVC survey was undertaken in August 2018 within up to 250 m of the Site (the NVC Survey Area) following the guiding principles detailed within the 'National Vegetation Classification: User's Handbook'[61]. Within the NVC Survey Area, locations were selected for NVC survey based on the presence of homogenous stands of vegetation and focusing on habitats of potential nature conservation value, as identified during the initial Phase 1 Habitat Survey (above). The full report is included in Appendix C.

[60] JNCC (2010) Handbook for Phase 1 habitat survey - A technique for environmental audit -Version 5

[61] Rodwell, J (2006) JNCC National Vegetation Classification: Users' handbook

The following NVC communities were recorded within the NVC Survey Area:

- M15b *Trichophorum cespitosum-Erica tetralix* wet heath, Typical sub-community;
- M17b *Trichophorum cespitosum-Eriophorum vaginatum* blanket mire, *Cladonia* species subcommunity; and,
- M25b *Molinia caerulea-Potentilla erecta* mire, *Anthoxanthum odoratum* sub-community.

The above communities are associated with Annex 1 habitats types: blanket bog, and Northern Atlantic wet heaths with *Erica tetralix.* Both habitats are also listed as priority habitats with the Scottish Biodiversity List (SBL) as well as the Sutherland and Caithness Local Biodiversity Action Plan (LBAP).

In accordance with SNIFFER guidance[62], M15 and M25 are considered to have the potential for moderate ground water dependency (dependent on setting); however, M17 is not a potential Ground Water Dependent Terrestrial Ecosystem (GWDTE).

No specially protected plants listed on Schedule 8 of The Wildlife and Countryside Act 1981[63] or Red Data listed plant species[64] were recorded within the NVC Survey Area.

6.3.3.3 Scottish Wildcat Walkover Survey

A Scottish Wildcat Walkover Survey was carried out by Arcus in February 2019, in accordance with SNH protected species survey guidelines[65] within and up to 200 m of the Site (the Wildcat Survey Area). The aim of the survey was to record suitable habitats and the presence of foraging, hunting and particularly denning Scottish wildcat as well as to inform the requirement for further detailed surveys, such as camera trapping.

Habitats recorded during the survey were assessed to be largely of low value to Scottish wildcat, primarily due to the exposed and waterlogged nature of the majority of the habitat found across the survey area and absence of woodland and linear features. Furthermore, the forestry plantations in the west of the Site were considered unsuitable for the species due to the dense, inaccessible and wet conditions within them.

Although some suitable potential denning sites such as windblown trees and buildings were recorded, a high level of disturbance would be predicted due to proximity of farm activity and livestock. Therefore, no confirmed dens or dens with the potential to be used or accessed by wildcats were recorded within the Wildcat Survey Area.

Although historic records of the species are known in the wider local Caithness area[57], in light of the low value of habitats recorded, as well as the absence evidence of the species recorded on Site, it is considered very unlikely that the species would be denning with the Site or immediately surrounding area; therefore, no further wildcat surveys are recommended at this stage.

6.4 Further Baseline Methodology

In addition to the baseline studies already carried out (see Section 6.3), the following baseline methods are proposed.

[62] SNIFFER (2009) WFD95: A Functional Wetland Typology for Scotland - Project Report. ISBN: 978-1-906934-21-7

[63] Available online at: http://jncc.defra.gov.uk/PDF/waca1981_schedule8.pdf

[64] Cheffings, C.M. & Farrell, L. (Eds), Dines, T.D., Jones, R.A., Leach, S.J., McKean, D.R., Pearman, D.A., Preston, C.D., Rumsey, F.J., Taylor, I. 2005. The Vascular Plant Red Data List for Great Britain. Species Status 7: 1-116. Joint Nature Conservation Committee, Peterborough.

[65] SNH (n.d) Planning and Development: Protected Animals [Online] https://www.nature.scot/professional-advice/planning-and-development/natural-heritage-advice-planners-and-developers/planning-and-development-protected-animals (Accessed 25/03/2019)

6.4.1 Detailed Desk Study

In order to augment baseline data collected and, if necessary, refine the survey scope, recent records (within 20 years) of protected and/or notable species and details of sites of ecological interest will be sought. Data consultation will aim to collect up-to-date records of the following: non-statutory designated sites located within 2 km of the Site, (extended to 5 km for those designated for bats); rare, notable or protected flora and fauna within 5 km of the Site (extended to 10km for bats); and records of invasive, non-native species within 2 km of the Site.

In the first instance, records will be sought from publicly available data resources, as well as, but not limited to, the following organisations:

- SNH;
- The Council;
- Highland Biological Recording Group;
- North Highland Bat Network;
- Botanical Society of Britain and Northern Ireland;
- Scottish Badgers;
- Scottish Wildlife Trust; and,
- Caithness District Salmon Fishery Board.

6.4.2 Consultation

In addition to formal scoping, early and thorough consultation with key stakeholders is a key element in the assessment process. SNH will be engaged to discuss preliminary survey results and key constraints where necessary, whist ensuring that statutory consultees are kept informed about the nature of the proposal. As part of EIA, statutory and non-statutory consultees have an important role in providing site-specific data, contextual information and expertise. Consultation will enable evaluation and agreement of the scope and methods of any ecological investigations, including the period for data collection.

6.4.3 Baseline Survey Methods

6.4.3.1 Bat Surveys

Bat surveys will be carried out between April and October 2019 in accordance with new SNH Bat Survey Guidelines[66]. A preliminary desk study of the Site and wider local area indicates that it is likely to be of low suitability for bats, largely due to the dominance of open, exposed, upland habitats across the Site, and the limited presence of woodland and other linear suitable to support, commuting, foraging and roosting bats. Accordingly, we have proposed a low-risk survey strategy as detailed below.

Remote Monitoring Activity Surveys

Remotely operating full spectrum bat detectors will be used to automatically record bat activity on three seasonal occasions between April and October 2019 inclusive. In accordance with the 2019 survey guidelines and based on the proposed number of turbines, fourteen AnaBat Swift bat detectors will be deployed for a minimum of ten consecutive nights each survey season. The AnaBats will be located within the potential turbine layout and a range of representative habitats and control sites, where feasible.

All bat data recorded during survey will be analysed using Anabat Incite analysis software, ideally within a month of it being recorded to ensure that issues are identified promptly.

[66] Scottish Natural Heritage, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust (BCT) (2019): Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation.

Transect Surveys

Due to the dominance of habitats of low suitability to support bat and the spatial and temporal limitations of transect survey data generally, it is not believed that transect surveys would be of any notable additional value to the bat survey baseline data collected, and therefore would have a negligible influence in ensuring the robustness of the assessment on the potential impacts on bats. In light of this and in accordance with the 2019 guidelines, transect surveys have been scoped out of the proposed surveys.

Roost Surveys

Data searches will be conducted to identify known roost sites in the vicinity of the Site. Potential bat roosts on site will be identified and assessed during initial site visits and, if necessary, emergence/re-entry surveys carried out at potential roost sites considered to be at risk. The Site is dominated by conifer plantation and upland habitats so bat roosts are considered unlikely to occur within the 200 m of the Site.

6.4.3.2 Protected Species Survey

Based on available habitats as well as historical and recent records, the Site has the potential to support several protected species including but not limited to: otter, water vole, pine marten, badger and red squirrel. The following species-specific surveys will be conducted to establish the status and distribution of these species.

Otter and water vole survey

Surveys will be carried out in summer 2019, avoiding surveying during or after periods of heavy rainfall. All watercourses within the Site and up to 200 m of the Development Area that are potentially at risk of impact will be surveyed in early summer by an experienced ecologist in accordance with SNH guidelines[67].

In line with established guidelines[68], should water vole surveys in early summer be inconclusive, a second survey may be required to be carried out in late summer/early autumn.

Red squirrel, badger and Pine Marten Surveys

A walkover survey will be carried out along suitable habitats up to 250 m of the Site in accordance with SNH guidelines[67], to assess the suitability of habitats for badger, pine marten and red squirrel and to record signs of their presence.

6.4.3.3 Fisheries Habitat Survey (FHS)

Due to the likely presence[69] of Atlantic salmon (*Salmo salar*) in the Akran Burn, a Fisheries Habitat Survey will be carried out by qualified surveyors in accordance with Scottish Fisheries Co-ordination Centre (SFCC) guidance[70] to identify the presence of salmonid spawning habitat that may be affected by the Development. A detailed assessment of fish habitat quality and utilisation potential will be undertaken using baseline information collected following literature review, consultation and field survey. The FHS will also identify other sensitive areas, such as freshwater pearl mussel habitat or lamprey nursery habitat,

[67] SNH Protected Species Advice for Developers. [Online] Available at: https://www.nature.scot/professional-advice/planning-and-development/natural-heritage-advice-planners-and-developers/planning-and-development-protected-animals (Accessed 25/03/2019)

[68] SNH (2019) SNH Sitelink [Online] Available at: https://sitelink.nature.scot/home (Accessed 26/03/2019)

[69] Marine Scotland (2018) Scotland's Environment [Online] https://marinescotland.atkinsgeospatial.com/nmpi/ (Accessed 25/03/2019)

[70] SFCC (2007) Habitat Surveys - Training Course Manual – Revised [Online] Available at: https://sfcc.co.uk/assets/files/SFCC%20Habitat%20Training%20Manual.pdf (Accessed 26/03/2019)

and will inform the need for further surveys (e.g. electrofishing or freshwater pearl mussel surveys).

6.5 Key Sensitivities

There are potential ecological sensitivities relating to wind farm developments in this part of Scotland. In the context of EcIA these features will be defined as IEFs. Although IEFs cannot be confirmed until the completion of all baseline survey, it is anticipated that IEFs are likely to include:

- Caithness and Sutherland Peatlands SAC/Ramsar - due to the proximity of the SAC and the confirmed or likely presence of qualifying features with the Site, a Habitat Regulation Screening will be carried out;
- Sensitive habitats such as Blanket bog and wet heath (features of the Caithness and Sutherland Peatlands SAC/Ramsar - as well as and any other Annex I, Scottish Biodiversity List (SBL), and potential GWDTEs);
- Otter and Water vole – a number of watercourses and waterbodies located within and in close proximity to the Site have potential to support otter (a feature of the Caithness and Sutherland Peatland SAC/Ramsar) and water vole and likely support otter;
- Pine Marten and Red Squirrel – standing and recently felled coniferous plantation woodland as well as marginal and connecting habitats have the potential to support pine marten & red squirrel;
- Aquatic species – aquatic habitats within and in close proximity to the Site have the potential to support salmonid species; and,
- Bats – habitats within the Site may support low number of common and widespread commuting and foraging bat species.

6.6 Potential Effects and Assessment

The ecological assessment will focus on the potential effects of indirect and direct impacts upon IEFs during construction, operation and decommissioning of the Development. This will be assessed in terms of, but not limited to, the effects of the following:

- Direct impacts on nearby designated sites and their qualifying interests;
- Direct and indirect habitat loss and disturbance - temporary or permanent loss to terrestrial and aquatic habitats;
- Turbine-related bat mortality - death or injury by collision with the turbine blades; and
- Indirect and direct effects on protected fauna including, but not limited to, otter, pine marten, water vole, red squirrel, and Salmonid fish.

6.6.1 Scoped In Effects

At this stage the potential effects considered feasible include, but are not limited to, the following:

- Direct and indirect effects on the integrity of the Caithness and Sutherland SAC/Ramsar;
- Direct habitat loss and disturbance - temporary or permanent loss of Annex 1 or otherwise high value terrestrial habitats;
- In-direct habitat disturbance - temporary pollution or degradation of terrestrial or aquatic habitats;
- Turbine-related bat mortality - death or injury by collision with the turbine blades; and
- Indirect and direct effects on protected fauna including, but not limited to, otter, pine marten, water vole, red squirrel, and Salmonid fish - death or injury by collision with

construction related plant, disturbance or displacement due to Development related noise and vibration and loss of habitats.

6.6.2 Scoped Out Effects

Based on the baseline conditions recorded to date or likely to be present, distance from the Site, and the nature of the relevant qualifying interests it is proposed that impacts on of the following statutory sites (and related qualifying interests) lie outwith the Zone of Influence of the Development, and are therefore scoped out of further assessment:

- Strathy Coast SSSI;
- Red Point Coast SSSI; and,
- Sandside Bay SSSI.

6.7 Key Questions for the Council / Consultees

Key questions for the Council and Statutory Consultees include:

- Are consultees content with the proposed methods for EcIA?
- Are consultees content with the extent of ecology datasets and completed surveys obtained to date?
- Are consultees content with the proposed scope of further surveys?
- Are consultees in agreement with the predicted IEFs that could be affected by the Development, as well as the effects scoped in /out of further assessment? and
- Do consultees consider that peatland restoration of degraded bog may be sufficient to mitigate for potential impacts on blanket bog habitats?

7 ORNITHOLOGY

7.1 Introduction

This Section sets out the approach to the evaluation of the ornithological interests making use of the Site and surrounding area and to the assessment of potential impacts on birds throughout the construction, operation and decommissioning phases of the Development.

7.2 Assessment Methodology

The ornithological assessment will be undertaken following guidance produced by the CIEEM for EcIA[71] which sets out a recommended process for assessment via the following stages:

- Collation of baseline ornithological information obtained through desk-based study and field surveys to identify important ornithological features;
- Identification and characterisation of ornithological impacts, including collision risk (see below), from all phases of the Development;
- Incorporation of measures to mitigate identified impacts;
- Assessment of significance of residual impacts following mitigation;
- Identification of appropriate compensation to offset any significant residual impacts; and
- Identification of opportunities for ornithological enhancement.

Potential cumulative impacts on ornithological features and assessment of ornithological impacts from decommissioning or redevelopment of the Development will be considered as part of the EcIA.

The Ornithology Chapter of the EIA Report will be supported by a Technical Appendix containing full survey and analysis methods and detailed results. Sensitive data relating to breeding Schedule 1 birds will be included in a Confidential Annex, which will not be released in the public domain.

7.2.1 Collision Risk Modelling

As part of the EcIA, collision risk modelling (CRM) will be completed based on baseline flight activity survey data and using the Band model[72]. CRM will be completed for all target species considered to fly over the Development frequently enough to allow robust analysis. Details of the CRM will be included in the Ornithology Chapter of the EIA Report, with the results used to inform the assessment potential impacts of collision on target species.

7.2.2 Assessment of Significance

In line with the latest CIEEM guidance, rather than using a matrix approach to determine significance of effects, the approach used for the EcIA will be to consider the importance and sensitivity of the ornithological feature, and the characteristics and severity of the impact, and applying professional judgement as to whether the integrity of the feature will be affected. For the purposes of the EcIA, an effect that threatens the integrity of an ornithological feature will be considered to be significant.

[71] CIEEM, (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.* Chartered Institute of Ecology and Environmental Management, Winchester.

[72] Band, W, Madders, M, & Whitfield, D.P. (2007) *Developing field and analytical methods to assess avian collision risk at wind farms*. In: Janss, G, de Lucas, M & Ferrer, M (eds.) *Birds and Wind Farms*. Quercus, Madrid. 259-275.

7.3 Baseline Conditions

7.3.1 Desk-based Study

To supplement the baseline data (see Baseline Conditions below), a desk-based study was undertaken to obtain information on important ornithological features present within the vicinity of the Site. In addition, statutory sites designated for ornithological interests that could have potential connectivity with the Site have been identified, as detailed below.

7.3.1.1 Existing Ornithological Data

Existing ornithological records from within 10 km of the approximate site centre were sought from the following record holders in August 2018:

- Royal Society for the Protection of Birds (RSPB);
- Highland Raptor Study Group (HRSG); and
- Highland Biological Recording Group (HBRG).

A summary of the ornithological data returned is presented in Table 7.1. These records will inform the EcIA.

Table 7.1: Summary of Ornithological Datasets Obtained as part of the Desk-Based Study

Source	Summary of response/dataset received
RSPB	Returned 292 records of 79 bird species, including common and widespread species of low conservation concern from 2007-16. This included 22 species listed on Schedule 1 and/or Annex I, of which the following were potentially or confirmed to be breeding: common scoter, red-throated diver, black-throated diver, osprey, golden eagle, hen harrier, corncrake (*Crex crex*), dunlin, greenshank and Arctic tern.
HRSG	Returned a single registration of a merlin from June 1998; the breeding status was not stated.
HBRG	Stated during the initial response that there are single records for merlin and peregrine within the search area, both from 2017; further details have yet to be received.

7.3.1.2 Statutory Sites

The following statutory sites designated for ornithological features were identified using the SNH 'Sitelink' website[73] and 'MAGIC' interactive online mapping tool[74]:

- Sites of European importance within 20 km of the Site:
  - Special Protection Areas (SPAs); and
  - Ramsar sites.
- Sites of national importance within 10 km of the Site:
  - SSSIs.

Three statutory sites of international importance were identified within 20 km of the Site, two of which have multiple qualifying interests for ornithological features. A further four sites of national importance (SSSIs) were identified within 10 km of the Site. Information relating to these statutory sites is summarised in Table 7.2, and locations are shown in Figure 6.1.

[73] SNH Sitelink: Available at: https://sitelink.nature.scot/home (last accessed 13/03/2019)

[74] SNH Sitelink: Available at: https://magic.defra.gov.uk/home.htm (last accessed 15/03/2019)

Table 7.2: Summary of Statutory Sites of International and National Importance Designated for Ornithological Interest

Site name	Designation	Qualifying ornithological interests	Proximity to/ direction from the Site
Sites of European Importance			
Caithness and Sutherland Peatlands	SPA	• Twelve breeding species: red-throated diver (*Gavia stellata*), black-throated diver (*G. arctica*), wigeon (*Mareca penelope*), common scoter (*Melanitta nigra*), golden eagle (*Aquila chrysaetos*), hen harrier (*Circus cyaneus*), golden plover (*Pluvialis apricaria*), dunlin (*Calidris alpina*), wood sandpiper (*Tringa glareola*), greenshank (*Tringa nebularia*), short-eared owl (*Asio flammeus*) and merlin (*Falco columbarius*).	Adjacent to southeast
	Ramsar site	• Two breeding species: greylag goose (*Anser anser*) and dunlin. • Breeding bird assemblage.	
North Caithness Cliffs	SPA	• Six breeding species: fulmar (*Fulmarus glacialis*), Kittiwake (*Rissa tridactyla*), common guillemot (*Uria aalge*), razorbill (*Alca torda*), puffin (*Fratercula arctica*) and peregrine (*Falco peregrinus*), • Breeding seabird assemblage.	1.5 km to north
Caithness Lochs	SPA	• Three non-breeding wildfowl species: Greenland white-fronted goose, greylag goose and whooper swan (*Cygnus cygnus*).	10.1 km to southeast
	Ramsar site		
Sites of National Importance			
East Halladale	SSSI	• Two breeding species: golden plover and dunlin. • Breeding bird assemblage.	Adjacent to southeast
Red Point Coast	SSSI	• Breeding common guillemot.	1.5 km to north
West Halladale	SSSI	• Two breeding species: black-throated diver and common scoter. • Breeding bird assemblage.	2.7 km to southwest
Lochan Buidhe Mires	SSSI	• Breeding bird assemblage.	8.9 km to west-southwest

7.3.2 Initial Surveys (2014-16)

Initial ornithology surveys were completed between 2014 and 2016, as summarised below.

Flight Activity Surveys from three Vantage Point (VP) locations between April 2014 and March 2016, as follows:

- 2014 breeding season (April to August): 54 hours per VP;
- 2014-15 non-breeding season (September to March): 42 hours per VP;
- 2015 breeding season (April to August): 48 hours per VP; and
- 2015-16 non-breeding season (September to March): 42 hours per VP.

Moorland Breeding Bird Surveys of the Site and surrounding 500 m buffer, following an adapted version of the Brown and Shepherd (1993) method[75] for censusing upland waders; four visits between April and July, in both 2014 and 2015.

Breeding Raptor Surveys of the Site and surrounding 2 km buffer, following survey methods described in Hardey *et al*. (2006)[76]; monthly visits completed between April and August, in both 2014 and 2015.

Breeding Diver Surveys to identify whether red-throated or black-throated divers were breeding on any waterbodies within 2 km of the Site, following the methods described in Gilbert *et al*. (1998)[77]; monthly visits completed between April and July, in both 2014 and 2015.

Focal Red-throated Diver (*Gavia stellata*) Watches completed at two breeding lochs one between June and July 2014, the other between July and August in 2015.

Winter Bird Surveys to document the presence of wintering moorland birds within 500 m of the Site, using a combination of walkover surveys and shortened, ad-hoc watches from suitable VP locations)[77]; three visits completed during winter 2014-15 (in November, January and February).

7.3.3 Further Breeding Season Surveys (2018)

Further breeding season surveys were completed between February and August 2018 and summarised below. Confidential information can be found in Appendix D.

Flight Activity Surveys completed from three VP locations at similar locations (within 50-100 m) to those used in 2014-16, and following current SNH guidance[78]; 72 hours of surveys completed per VP between February and August 2018.

Moorland Breeding Bird Survey of the Site and surrounding 500 m buffer, following an adapted version of the Brown and Shepherd (1993)[75] method for censusing upland waders; four visits between April and July 2018.

Breeding Raptor and Owl Surveys for nesting eagles within 6 km of the Site and other raptor and owl species within 2 km, following current raptor survey methods[79] and SNH guidance[78]; eleven visits completed between February and August 2018.

Breeding Diver Surveys to identify whether red-throated or black-throated divers were breeding on any waterbodies within 2 km of the Site, following the methods described in Gilbert *et al*. (1998)[77] in accordance with current SNH guidance[78]; completed over eight visits between mid-June and July 2018.

Focal Red-throated Diver (*Gavia stellata*) Watches completed at two breeding lochs where evidence of breeding was observed during the 2018 Breeding Diver Surveys, following current SNH guidance[78]; 24 hours of survey between early and mid-August from a single VP location affording observational coverage of both lochs.

A summary of observations of target and notable bird species recorded within the relevant survey areas during baseline surveys is provided below. Note that details of nesting Schedule 1 birds are included in a Confidential Appendix D, that accompanies this Report.

[75] Brown, A.F. & Shepherd, K.B. (1993) A method for censusing upland breeding waders. *Bird Study* 40, 189-195.

[76] Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. (2006). *Raptors: a field guide to survey and monitoring*. The Stationery Office, Edinburgh.

[77] Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird monitoring methods. A manual of techniques for key UK species*. RSPB, Sandy, Bedfordshire.

[78] SNH (2017) *Recommended bird survey methods to inform impact assessment of onshore wind farms*.

[79] Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013) *Raptors: a field guide to survey and monitoring*, 3rd edition. The Stationary Office, Edinburgh.

7.3.4 Qualifying Interests of Nearby Statutory Sites

The following qualifying interests were recorded during the surveys undertaken at the Site in 2014, 2015, 2016 and 2018:

Greylag goose (*Anser anser*): respective totals of 58 and 29 flights were recorded during the 2014-16 and 2018 Flight Activity Surveys. However, numbers were relatively small, with a maximum flock size of 49 birds. There was no evidence of breeding in the vicinity of the Site.

Red-throated diver (*Gavia stellata)*: a single pair was confirmed to be nesting within the Breeding Diver Survey Area during all breeding seasons surveyed (2014, 2015 and 2018), with a second pair potentially breeding in 2018. Overall, breeding occurred at two different lochs within the survey area. Singles and pairs were also recorded on other waterbodies within the Breeding Diver Survey Area during all breeding seasons. However, no evidence of breeding was observed on any additional waterbodies.

Black-throated diver (*Gavia arctica*): a single adult was recorded in May 2014, several flights were recorded in 2015, and a single flight was recorded during a Focal Red-throated Diver Watch in 2018. However, there was no evidence of breeding during any of the survey years.

Hen harrier (*Circus cyaneus):* a pair of birds was observed in early May 2014, but no evidence of breeding was observed. Similarly, there were occasional records of single male and female birds (observed separately) in 2015, but no evidence of breeding. Eleven flights were recorded in 2018. Observations included a food pass between a male and a female bird in early July 2018. However, no further evidence of breeding was observed during targeted survey effort for this species in 2018, and no nest site was identified.

Golden plover (*Pluvialis apricaria*): a single breeding territory was identified during both 2014 and 2015, but there was no evidence of breeding in 2018. Flight activity was low, with a total of ten flights in 2014-16 and a single flight in 2018.

Dunlin (*Calidris alpina*): single territories were present in both 2014 and 2015, and a total of seven dunlin flights were recorded during the 2014-16 survey period. The species was not recorded during the 2018 breeding season surveys.

Greenshank (*Tringa nebularia*): there were occasional observations during the 2014 and 2015 breeding seasons, but no evidence of breeding activity was observed. A single greenshank was recorded in late April 2018, and subsequently heard singing nearby. However, there were no further observations of this species during the remaining survey period; therefore, the species was not considered to have bred in 2018.

Short-eared owl (*Asio flammeus*): behavioural observations in May 2014 indicated the possible presence of a breeding territory within the Breeding Raptor Survey Area, but breeding was not confirmed. The species was not observed in 2015 or 2018.

Merlin (*Falco columbarius*): there was some evidence that a pair nested within the Breeding Raptor Survey Area in 2014, and a pair bred in 2018 and successfully fledged two young. No evidence of breeding was observed in 2015. Flight activity was relatively low during all survey years.

Peregrine (*Falco peregrinus*): there were occasional observations of this species in 2014 and 2015, but no evidence of breeding was observed. There were also occasional observations of peregrines in 2018, and it was considered likely that a pair bred outside the Breeding Raptor Survey Area in 2018, but no nest sites were identified and breeding was not confirmed. Flight activity was low during all survey years

Additional species: low levels of flight activity by the following qualifying species of nearby statutory sites were recorded during the 2014-16 and/or 2018 surveys: whooper

swan (two flights), golden eagle (ten flights[80]), and wood sandpiper (one flight). There was no evidence that either golden eagle or wood sandpiper was breeding within the relevant survey areas, and no observations of foraging whooper swan in the vicinity of the Site.

7.3.5 Other Target Species:

Pink-footed goose (*Anser brachyrhynchus*): respective totals of 15 and ten flights were recorded during the 2014-16 and 2018 Flight Activity Surveys. In all years, the majority of flights were recorded during April and are likely to relate to wintering birds on passage to northern breeding grounds. Numbers were relatively small, with a maximum flock size of 90 birds.

Grey heron (*Ardea cinerea*): a small heronry (comprising approximately four pairs of grey herons) was identified at Ackron Farm during the May 2018 Moorland Breeding Bird Survey. However, flight activity was low across all survey years, with just five grey heron flights recorded during both the 2014-16 and 2018 Flight Activity Surveys (i.e. ten flights in total across all years).

Oystercatcher (*Haematopus ostralegus*): a single breeding territory was identified in a similar location in the west of the Moorland Breeding Bird Survey Area during each breeding season (2014, 2015 and 2018). However, flight activity was low, with just two flights recorded during the 2018 Flight Activity Surveys (there were none during the 2014-16 Flight Activity Surveys).

Lapwing (*Vanellus vanellus*): between one and three breeding territories were identified in each breeding season (2014, 2015 and 2018). Flight activity was relatively low, with a total of seven flights in 2014-16 and 13 flights in 2018.

Curlew (*Numenius arquata*): between three and six breeding territories were identified in each breeding season (2014, 2015 and 2018). Moderate levels of flight activity were recorded (54 flights in 2014-16 and 16 in 2018).

Snipe (*Gallinago gallinago*): between three and six breeding territories were identified in each breeding season (2014, 2015 and 2018). Low to moderate levels of flight activity were recorded (30 flights in 2014-16 and six in 2018).

Arctic tern (*Sterna paradisaea*): ten flights were recorded in 2014, but the species was not recorded in 2015. In 2018, a small breeding colony was identified in 2018. A minimum of five apparently occupied nests (AONs) were counted in June and a small number of downy/fledged young were observed in July. However, the chicks were not present the following day and the colony was assumed to have failed, possibly due to predation. A total of 75 Arctic tern flights were recorded during the 2018 Flight Activity Surveys, between May and July.

Crossbill (*Loxia curvirostra*): small numbers of breeding territories were noted to be present in 2018.

Additional species: low levels of flight activity[81] by the following target species were recorded during the 2014-16 and/or 2018 surveys, but no evidence of breeding was observed within the relevant survey areas during any of the surveys: shelduck (*Tadorna tadorna*), mallard (*Anas platyrhynchos*), teal (*Anas crecca*), goldeneye (*Bucephala clangula*), osprey (*Pandion haliaetus*), white-tailed eagle (*Haliaeetus albicilla*), common sandpiper (*Actitis hypoleucos*) and great skua (*Stercorarius skua*).

[80] Including flights recorded during breeding Raptor Surveys.

[81] Ten or fewer flights in total (i.e. across all survey years)

7.4 Previous Consultation

7.4.1 2015 Scoping Report

In their response (dated 15/05/2015) to the 2015 Scoping Report, the Council noted that the EIA Report should address the likely impacts on the nature conservation interests of all designated sites in the vicinity of the Development. With respect to ornithology, the Council advised that the ornithological baseline at the Site should be established for inclusion in the EIA Report, including the presence of any bird species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

In their response (dated 15/04/2015) to the 2015 Scoping Report, SNH noted that the Development is within the foraging range of the qualifying interests of the Caithness and Sutherland Peatlands SPA, as well as certain qualifying features, of the adjacent East Halladale SSSI, namely breeding golden plover and dunlin. The SSSI is a component of the SPA. SNH advised that both direct and indirect impacts on protected sites and their ornithological interests would require full assessment as part of the EIA process.

7.4.2 Further Consultation with SNH (2018)

A request for informal scoping advice regarding the scope of the 2018 baseline ornithology surveys was submitted to SNH on 06/04/2018. In their response (sent via email on 16/04/2018), SNH stated that the approach to the ornithological survey work was reasonable and proportionate, but recommended that the proposed breeding raptor survey area should be extended to 6 km for golden eagle. However, as SNH did not have any records of breeding golden eagle within this search area, they further advised consultation with the local Raptor Study Group (RSG) to obtain the most up-to-date information, which should be used to inform survey requirements.

Following on from this, a request was made to SNH (via email dated 16/04/2018) to comment on the proposal to scope out consideration of potential impacts on the qualifying ornithological interests of the following statutory sites:

- West Halladale SSSI;
- North Caithness Cliffs SPA; and,
- Red Point Coast SSSI.

In their response (via telephone conversation on 17/04/2018), SNH stated that their current position was that potential impacts on the North Caithness Cliffs SPA and Red Point Coast SSSI were unlikely and could be scoped out. SNH further advised that potential impacts on the West Halladale SSSI should be considered since it forms a component of the adjacent Caithness and Sutherland Peatlands SPA, but based on the information provided to date, it was unlikely that potential ornithological impacts would represent a 'show stopping' constraint.

Following completion of the 2018 breeding season ornithology surveys, a further request was made to SNH on 01/11/2018 for comment on the requirement for further surveys to inform a planning application, anticipated in 2020. The request was supported by a brief report summarising the ornithology data collected to date. In their response (via email dated 03/12/2018), SNH stated that, in general, the information submitted appeared to be acceptable. In addition, the following points were noted:

- Submission of an application in early 2020 would allow inclusion of two years of breeding bird survey data collected within the previous five years;
- SNH further commented that a 2020 submission date would only allow inclusion of one year of non-breeding bird survey data collected within the previous five years if no further non-breeding season surveys were completed. However, it was further

noted that this was not critical because the SPA/SSSI bird interest is for breeding birds[82];
- There is potential for connectivity between breeding merlins recorded during the baseline surveys and the Caithness and Sutherland Peatlands SPA if birds are close enough to forage over it. SNH guidance states that merlins can forage up to 5 km from the nest. SNH therefore advised that potential impacts on merlin should be assessed in relation to the Caithness and Sutherland Peatlands SPA; and
- Stated that assessment of impacts on Arctic terns should be completed at the Natural Heritage Zone (NHZ) level.

7.5 Key Sensitivities

The following species listed in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and/or Annex I of the Birds Directive are confirmed to have bred, or potentially bred, on Site or in the surrounding area during the baseline surveys:

- Red-throated diver;
- Hen harrier;
- Golden plover;
- Dunlin;
- Arctic tern;
- Short-eared owl and
- Merlin.

With the exception of Arctic tern, all of these species are qualifying interests of the adjacent Caithness and Sutherland Peatlands SPA.

Although crossbill is also a Schedule 1 species, this is not considered to be a key sensitivity because the extent of suitable breeding habitat within 500 m of the Site is limited. However, impacts on this species will be fully considered as part of the EcIA.

7.6 Potential Effects and Assessment

Potential effects on target bird species may include the following:

- Permanent or temporary loss of breeding and/or foraging habitat during construction;
- Collision risk during operation; and
- Disturbance and/or displacement of breeding or foraging birds during all phases of the Development.

7.6.1 Scoped In Effects

Based on baseline conditions, it is proposed that impacts on qualifying ornithological interests of the following statutory sites are scoped in:

- Caithness Cliffs SPA and Ramsar site; and
- East Halladale SSSI.

In addition, it is proposed that the following will be scoped in:

- Potential impacts on breeding Schedule 1 and/or Annex I species listed in Section 7.3 due to habitat loss, disturbance and/or displacement;
- Potential impacts on additional breeding wader species (oystercatcher, lapwing, curlew and snipe) due to habitat loss, disturbance and/or displacement; and
- Potential collision risk to all target species for which sufficient flights were recorded during Flight Activity Surveys.

[82] Specific statutory sites were not named, but this is presumed to refer to the Caithness and Sutherland Peatland SPA and East Halladale SSSI, and potentially the North Caithness Cliffs SPA, Red point Coast SSSI and/or West Halladale SSSI.

7.6.2 Scoped Out Effects

Based on the baseline conditions recorded and distance from the Site, it is proposed that impacts on qualifying ornithological interests of the following statutory sites are scoped out:

- North Caithness Cliffs SPA;
- Caithness Lochs SPA and Ramsar site;
- Red Point Coast SSSI;
- West Halladale SSSI; and
- Lochan Buidhe Mires SSSI.

In addition, it is proposed that impacts on non-breeding target species are scoped out, except where flight activity recorded during Flight Activity Surveys is sufficient to assess collision risk impacts.

It is further proposed that potential impacts on grey heron are scoped out because this is a species of low conservation concern and levels of activity within the Moorland Breeding Bird Survey Area were very low. Good practice measures will be implemented to ensure that all breeding bird species (including those of low conservation concern) are not disturbed.

7.7 Key Questions for the Council / Consultees

- Are consultees content with the proposed methods for assessment?
- Are consultees content with the extent of ornithological datasets obtained as part of the desk-based study?
- Are consultees content with the scope of the completed surveys? and
- Are consultees in agreement with the scoped out effects as described above?

8 ARCHAEOLOGY AND CULTURAL HERITAGE

8.1 Introduction

The assessment will consider direct, indirect, and cumulative effects upon the following receptors:

- Archaeology – above and below ground, designated or not. Consideration will be given to the potential for currently unknown (buried) archaeological remains to exist within the Development; and
- Cultural Heritage – World Heritage Sites, Scheduled Monuments, Listed Buildings, Inventoried Gardens and Designed Landscapes, Inventoried Battlefields and Conservation Areas.

The assessment will be conducted with reference to the relevant statutory and planning frameworks for cultural heritage. In addition to those mentioned in the Planning and Policy Section, cognisance will also be taken of Historic Environment Scotland Policy Statement June 2016 (HESPS)[83]. The assessment will be undertaken in accordance with current best practice and guidelines which includes the Chartered Institute for Archaeologists (CIfA) Standards and Guidance[84] and Historic Environment Scotland's Managing Change in the Historic Environment Series, specifically 'Managing Change in the Historic Environment: Setting' (2016)[85], amongst others.

8.2 Assessment Methodology

8.2.1 Desk-Based Assessment

A Desk-Based Assessment (DBA) of cultural heritage records will be compiled to establish the baseline against which the direct impact assessment will be carried out. Data will be gathered from the following sources:

- Historic Environment Scotland (HES) Datasets including Canmore;
- Highland Historic Environment Record (HER);
- Aerial photographs and cartographic information detailing previous land uses; and
- Local studies libraries and other archives, as appropriate.

A study area of 1 km radius from the Site will be used to collect data to inform on the archaeological potential of the Site.

The DBA will be augmented by a walkover survey in order to:

- Assess and validate documentary data collected;
- Identify the extent and condition of any visible archaeological remains; and
- Determine whether previously unrecorded historic features are visible.

[83] Historic Environment Scotland, 2016, *Scottish Environment Scotland Policy Statement June 2016* [Online] Available at: https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=f413711b-bb7b-4a8d-a3e8-a619008ca8b5 (Accessed 26/3/2019)
[84] Chartered Institute for Archaeologists (2017) *Standard and Guidance for Historic Environment Desk-Based Assessment*, Published December 2014, Updated January 2017 [Online]Available at: http://www.archaeologists.net/sites/default/files/CIfAS%26GDBA_3.pdf (Accessed 26/3/2019)
[85] Historic Environment Scotland, 2016, *Managing Change in the Historic Environment: Setting*. [Online] Available at: https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=80b7c0a0-584b-4625-b1fd-a60b009c2549 (Accessed 26/3/2019)

8.2.2 Environmental Impact Assessment and Report Chapter

8.2.2.1 Direct Effects

Known archaeology, as identified during the desk-based assessment will be avoided during site design, where possible. The assessment of physical effects will consider direct effects where sites or potential sites / buried archaeology are in danger of being disturbed or destroyed during the construction phase of the Development.

An assessment will be made of the potential indirect effects upon heritage assets and their setting including historic landscapes.

The assessment will proceed from a consideration of the 'sensitivity' of a cultural heritage feature against the 'magnitude' of any potential change, to arrive at the 'significance' of the effect. The assessment of sensitivity of archaeological and historical assets reflects the relative weight which statute and policy attach to them, principally as published in the HES Policy Statement.

8.2.2.2 Indirect Effects

The assessment of indirect effects considers changes in setting which have the potential to affect heritage assets. For the purposes of evaluating indirect effects upon the setting of heritage assets, designation status and proximity to the Development will determine whether further assessment is required. For the purposes of this document, designated heritage assets include Listed Buildings, Scheduled Monuments, Gardens and Designed Landscapes, Inventoried Battlefields and World Heritage Sites as well as regionally designated Conservation Areas (listed in Section 8.3). All nationally designated heritage assets that are within the 5 km Study Area (including those that are not within the ZTV), and designated assets within the 10 km Study Area that fall within the ZTV will be assessed as part of the EIA. The final list of assets requiring assessment will be agreed during consultation.

To aid the assessment of indirect effects, reference will be made to the extent of the potential visual impact as determined through the LVIA. Specifically, several LVIA viewpoints (as shown on Figure 5.2) would provide visual representations of effects upon heritage assets, including:

- Viewpoint 3, A836 Reay: which is representation of Listed Buildings and Scheduled Monuments in the village Reay, to the northwest of the Site;
- Viewpoints 4, A836 Layby and 5 A836 Melvich: which are representative of views across Halladale Bridge hut circles (SM3304), adjacent to the west of the Site;
- Viewpoint 6, Portskerra: which is representative of Listed Buildings in the village Melvich to the north of the Site; and
- Viewpoint 8, Strath Halladale, Calgarry: which is representative of Listed Buildings in Achiemore to the south of the Site.

The assessment may also include additional visual representations such as wirelines, as appropriate and agreed in consultation.

The archaeology and cultural heritage assessment will include proposals for mitigation of any identified impacts where necessary.

The assessment of indirect effects upon the setting of undesignated archaeology and cultural heritage assets is broadly based upon its designation status or lack thereof. Undesignated sites are often of low sensitivity and therefore will not receive a significant indirect effect as defined by the EIA Regulations. As such, they can be scoped out of the EIA at this stage unless specific assets are requested during consultation.

8.2.2.3 Cumulative Effect

For the purposes of the assessment of cumulative effects, only wind farm developments (operational, under construction, or consented) within approximately 10 km of the Site will be considered. The potential for a significant cumulative effect is considered likely to be limited to receptors located within the 5 km study area of the Development. As such, the 10 km cumulative study area allows for the assessment of effects within the 5 km radius of the Development and other wind farms, specifically where the ZTVs for the Development and cumulative wind farms overlap, i.e. where each is theoretically simultaneously visible.

8.3 Baseline Conditions

Initial information relating to archaeology and cultural heritage has been gathered through a preliminary desk top search using available online resources to indicate potential features of interest, as listed in Section 8.2.1.

Preliminary desk studies indicate that there are no World Heritage Sites, Inventoried Battlefields, Inventoried Gardens and Designed Landscapes, World Heritage Sites or Conservation Areas situated within 10 km; however, there are 17 Scheduled Monuments and 27 Listed Buildings.

There are five Scheduled Monuments and 19 Listed Buildings within 5 km of the Development. These are detailed in Tables 8.1 and 8.2 below. Due to their proximity to the Development, these are the assets considered most likely to be adversely affected by the Development. No designated sites fall within the Site. Figure 8.1 shows the location of those sites within 5 km of the Development.

The closest Scheduled Monument is Halladale Bridge (SM3304), which consists of two hut circles located adjacent to the northwest corner of the Site along the A836. The remaining Scheduled Monuments are near Reay and Fresgo, approximately 4 km from the Site boundary, and at Baligill, approximately 5 km to the northwest. These are detailed in Table 8.1 and shown in Figure 8.1.

The closest Listed Buildings are 1.3 km to the northwest at Bighouse in Melvich, with other Listed Buildings clustered along to A836 in the village of Reay, approximately 4 km to the northwest, and the hamlet of Achiemore, approximately 5 km to the south. These are detailed in Table 8.2 and shown in Figure 8.1.

Due to their proximity to the Development, these are the assets considered most likely to be affected by the Development.

Table 8.1: Scheduled Monuments within 5 km of the Site Boundary

Scheduled Monument Number	Scheduled Monument Name	Distance from the Site
458	Knock Stanger, Cairn 730m E of Sandside House	4 km northeast
615	Reay, Burial Ground, Old Church and Cross Slab 175m E of Parish Church	4.5 km northeast
616	Sandside House, Reay, Two Carved Stones	3.3 km northeast
3304	Halladale Bridge, Hut Circles 670m NE of, on banks of Giligill Burn	Adjacent to the western site boundary
4265	Baligill Mill	4.9 km northwest

Table 8.2: Listed Buildings within 5 km of the Site Boundary

Listed Building Number	Listed Building Name	Category	Distance from the Site
7140	Bighouse Farm Steading	C	1.3 km northwest
7141	Smigel Mill	B	4.8 km south
7142	Strath Halladale Mission Church	C	4.7 km south
7159	Bighouse House, Garden Walls and West Gate Piers	B	1.4 km northwest
7160	Bighouse, Garden House and Walled Garden	A	1.3 km northwest
7161	Bighouse, Barracks	B	1.4 km northwest
7162	Bighouse, Ice House	B	1.4 km northwest
12915	Smigel Bridge	B	4.8 km south
14980	Reay, Old Parish Church	B	4.6 km northeast
14981	Reay Bridge	C	3.4 km northeast
14982	Reay Village, Smithy Cottage and Steading Range	C	3.3 km northeast
14984	Sandside House	B	3.2 km northeast
14985	Sandside House, Garden Walls, 2 Walled Gardens, Dovecote and Privy	B	3.2 km northeast
14986	Sandside House, Implement Shed	A	3.3 km northeast
14987	Sandside House, Lodge	B	2.8 km northeast
14988	Sandside Harbour, The Bothy	A	4.2 km northeast
14992	Reay Parish Church	A	4.4 km northeast
17592	Reay, Reayburn House	B	4.7 km northeast
18831	Reay Village, Market Cross	B	3.5 km northeast

8.4 Key Sensitivities

It is anticipated that the potential direct effect on surviving non-designated archaeological remains may be reduced by avoidance through design iterations resulting in no direct effects to heritage assets.

Scheduled Monuments and Listed Buildings within the 5 km Study Area, as detailed in Tables 8.1 and 8.2, are the most likely heritage assets to receive a potential significant indirect effect from the Development, and as such, a detailed assessment of these heritage assets will be undertaken in the EIA Report.

8.5 Potential Effects and Assessment

Potential effects on heritage assets may include the following:

- Permanent or temporary loss of archaeological features within the Development footprint;
- Indirect effects upon the setting of heritage assets so as to affect the ability to understand, appreciate or experience these; and
- Cumulative effects upon the setting of heritage assets.

8.5.1 Scoped in Effects

Based on the baseline condition, it is proposed that the following effects will be scoped into the assessment and included within the EIA Report:

- Direct effects on known undesignated archaeological features within the development footprint;
- Direct effects on the potential for unknown archaeological remains to survive within the Development footprint;
- Indirect effects on all designated assets within the 5 km Study Area;
- Indirect effects on designated heritage assets within the 10 km Study Area where the assets, or key views towards the asset, lie within the ZTV; and
- The cumulative effect of the Development in conjunction with other wind farm developments within a 10 km radius which allows for the likely significant effects within 5 km of each wind development to be considered.

8.5.2 Scoped out Effects

The EIA Regulations state that only likely significant effects need to be considered within an EIA Report; therefore, if an effect will not be significant it can be scoped out of assessment. Based on this and the baseline conditions, it is proposed that the following effects will be scoped out of assessment:

- Indirect effects on undesignated heritage assets;
- Direct effects on known undesignated archaeological features outwith the Site;
- Indirect effects upon designated heritage assets beyond the 10 km Study Area;
- Indirect effects on designated heritage assets within the 10 km Study Area where the assets, or key views towards the asset, do not lie within the ZTV; and
- Cumulative effects from windfarm developments outwith the 10 km Study Area.

8.6 Key Questions for the Council / Consultees

Key questions for the Council and Consultees are:

- Do the Council and Consultees agree with the proposed methodology and scope of assessment?
- Are the Council and Consultees content to scope out indirect effects upon non-designated heritage assets?
- Are the Council and Consultees content to scope out assets outwith the 5 km Study Area where the assets, or key views towards the asset, do not lie within the ZTV?
- Are the Council and Consultees content that the selection of landscapes viewpoints will support and aid the heritage assessment?

- Does the Council and Consultees have any information regarding current or recent archaeological work or projects being undertaken within or in the vicinity of the Development site, particularly those whose results may not yet be recorded in the Historic Environment Record?
- Are the Council and Consultees aware of any further sites with statutory protection within the wider landscape whose settings may be affected by the Development? and
- Does the Council and Consultees have details of any cultural heritage sites in the vicinity of the Development site which it considers may raise significant issues within the EIA process for this Development?

9 NOISE

9.1 Introduction

Sources of noise during operation of a wind turbine are both mechanical (from machinery housed within the turbine nacelle) and aerodynamic (from the movement of the blades through the air). Modern turbines are designed to minimise mechanical noise emissions from the nacelle through isolation of mechanical components and acoustic insulation of the nacelle. Aerodynamic noise is controlled through the design of the blade tips and edges. In most modern wind turbines, aerodynamic noise is also restricted by control systems which actively regulate the pitch of the blades.

While noise from the wind turbines does increase with wind speed, at the same time ambient background noise (for example wind in trees) usually increases at a greater rate. Planning conditions are used to enforce compliance with specified limits.

The effects of noise from the Development will be assessed in consultation with the Environmental Health Department of the Council.

9.2 Study Area

The following study areas will be considered:

- Construction and decommissioning noise: effects within approximately 500 m of the proposed locations of wind turbines and development infrastructure;
- Operational noise: effects within approximately 2 km of the proposed locations of wind turbines; and
- Cumulative operational noise will be considered for other wind energy developments within approximately 5 km of the proposed turbine locations.

The precise definition of the study areas will be confirmed through preliminary noise modelling.

9.3 Assessment Methodology

9.3.1 Guidance

The following guidance and information sources are pertinent to the assessment of wind turbine noise:

- The Scottish Government's planning information on onshore wind turbines[86];
- Planning Advice Note 1/2011 (PAN1/2011): Planning and Noise[87];
- ETSU-R-97: The Assessment and Rating of Noise from Wind Farms[88]; and
- A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise[89].

9.3.1.1 Scottish Government Planning Information on Onshore Wind

The Scottish Government's Online Renewables Planning Advice[90] states that ETSU-R-97 should be used to assess and rate noise from wind energy developments, together with

[86] Scottish Government (2014). 'Onshore Wind Turbines'. Available Online At: https://beta.gov.scot/publications/onshore-wind-turbines-planning-advice/ [Accessed 21/05/2018]

[87] The Scottish Government (2011) PAN 1/2011: Planning and Noise

[88] ETSU (1996) ETSU-R-97 The Assessment and Rating of Noise from Wind Farms

[89] Institute of Acoustics (2013) A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise

[90] Scottish Government (2017) Renewables Planning Advice [Online] Available at: https://www.gov.scot/publications/renewables-planning-advice-index/ (Accessed 26/03/2019)

the Institute of Acoustics' *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*.

9.3.1.2 PAN 1/2011: Planning and Noise

PAN 1/2011 provides advice on the role of the planning system in helping to prevent and limit the adverse effects of noise. It promotes the principles of good acoustic design and the appropriate location of new potentially noisy development. An associated Technical Advice Note[91] offers advice on the assessment of noise impact and includes details of the legislation, technical standards and codes of practice appropriate to specific noise issues.

Appendix 1 of the Technical Advice Note: Assessment of Noise describes the use of ETSU-R-97 in the assessment of wind turbine noise.

9.3.1.3 ETSU-R-97

The assessment methodology for operational noise is described in ETSU-R-97 'The Assessment and Rating of Noise from Wind Farms'. The aim of ETSU-R-97 is to provide:

"Indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable restrictions on wind farm development or adding unduly to the costs and administrative burdens on wind farm developers or local authorities".

The report makes it clear from the outset that any noise restrictions placed on a development must balance the environmental impacts of the Development against the national and global benefits which would arise through the development of renewable energy sources.

Noise criteria (or limits) are specified, which are a combination of a margin of 5 dB above the prevailing, wind speed-dependent, background noise level and fixed lower noise limits, which are applicable in low background noise situations. The fixed lower noise limits are defined as:

- 35 - 40 dB, $L_{A90,10min}$ during the day, with the value chosen dependent on the number of affected properties, the effect of the number of kWh (kilowatt-hours) generated and the duration and level of exposure;
- 43 dB, $L_{A90,10min}$ at night, a level chosen to safeguard against sleep disturbance; and
- 45 dB, $L_{A90,10min}$ at properties where the occupier has a financial involvement in the proposed development, during both the day and night.

The specified noise limits relate to the cumulative effects of all turbines that affect a particular location.

Where the occupier of the property has a financial interest in a development, ETSU-R-97 states that the fixed lower noise limit for both daytime and night-time can be increased to 45 dB(A) and that *"consideration should be given to increasing the permissible margin above background"*.

9.3.1.4 The Good Practice Guide

The Good Practice Guide (GPG) was published by the Institute of Acoustics (IOA) in May 2013 and has been endorsed by the Scottish Government as current industry best practice (IOA, 2013). The guide presents current good practice in the application of ETSU-R-97 assessment methodology for wind turbine developments at the various stages of the assessment, and will be followed throughout the assessment.

[91] Scottish Government (2011) Assessment of Noise: Technical Advice Note [Online] Available at: https://www.gov.scot/publications/technical-advice-note-assessment-noise/ (Accessed 26/03/2019)

9.3.2 Methodology

The specific methodologies involved in applying ETSU-R-97 to a proposed new development will be detailed in full in the EIA Report but, in summary, these provide recommendations for noise limits relating to the existing levels of background noise for quiet day-time and night-time periods.

To carry out a noise assessment in accordance with ETSU-R-97, the following steps are required:

- Specify the number and locations of the wind turbines;
- Identify the locations of the nearest or most noise sensitive, neighbours;
- Determine the background noise levels as a function of site wind speed at the nearest neighbours, or a representative sample of the nearest neighbours;
- Determine the quiet day time and night time criterion curves from the background noise levels identified at the nearest neighbours;
- Specify the type and noise emission characteristics of the wind turbines proposed for the Site;
- Calculate the noise immission[92] levels due to the operation of the wind turbines as a function of site wind speed at the nearest neighbours; and
- Compare the calculated noise immission levels with the derived criterion curves and assess in the light of relevant planning requirements.

9.4 Baseline Conditions

Potential noise sensitive receptors (residential properties) in the vicinity of the Development are located only to the west of the Development and at distances in excess of 1 km from the current proposed turbine locations.

It is anticipated that baseline noise levels around the Development will be relatively low due to the remote setting. A survey will be carried out to establish prevailing background noise levels in relation to wind speed at a representative selection of potential receptors.

Key receptors and appropriate baseline noise monitoring locations will be confirmed through modelling prior to carrying out the baseline noise survey, and further consultation carried out with the Council to agree on their selection.

9.5 Key Sensitivities

The assessment is limited to the effects on human receptors at noise-sensitive locations, namely residential properties, schools, hospitals and places of worship. Each of these receptor types are considered to be of equal value.

Noise effects are assessed on the basis of the level of noise produced by the Development relative to established criteria or limits. In particular, the use of the ETSU-R-97 methodology does not result in a magnitude of effect in the manner employed for other types of assessment within the Environmental Impact Assessment (EIA), but rather a test of acceptability.

9.6 Potential Effects and Assessment

9.6.1 Scoped In Effects

An operational noise assessment, including cumulative noise, will be conducted in line with the ETSU-R-97.

ETSU-R-97 and the GPG state that the noise limits apply to the cumulative effect of noise from all wind turbines that may affect a particular location. Therefore, a search will be

[92] Immission' refers to the noise at a receiver location, whereas 'emission' relates to noise produced by a source.

undertaken to identify any wind energy developments either operational, consented or in planning which may require consideration in the assessment process. A screening exercise will then be carried out to identify which of these require inclusion in the cumulative assessment, based on consideration of the '10 decibel difference' rule described in the GPG.

Cumulative assessment will then be undertaken for each wind energy development identified by the initial screening exercise, taking account of any relevant planning conditions, installed turbine type, available headroom, controlling properties and the effects of wind direction as described in the GPG.

9.6.2 Scoped Out Effects

9.6.2.1 Low Frequency Noise and Infrasound

A study[93], published in 2006 by acoustic consultants Hayes McKenzie on the behalf of the DTI, investigated low frequency noise from wind farms. This study concluded that there is no evidence of health effects arising from infrasound or low frequency noise generated by wind turbines, but that complaints attributed to low frequency noise were in fact, most likely due to a phenomenon known as Amplitude Modulation (AM).

In February 2013, the Environmental Protection Authority of South Australia published the results of a study into infrasound levels near wind farms[94]. This study measured infrasound levels at urban locations, rural locations with wind turbines close by, and rural locations with no wind turbines in the vicinity. It found that infrasound levels near wind farms are comparable to levels away from wind farms in both urban and rural locations. Infrasound levels were also measured during organised shut downs of the wind farms; the results showed that there was no noticeable difference in infrasound levels whether the turbines were active or inactive.

Bowdler et al. (2009)[95] concludes that:

"...there is no robust evidence that low frequency noise (including 'infrasound') or ground-borne vibration from wind farms generally has adverse effects on wind farm neighbours".

9.6.2.2 Amplitude Modulation

In its simplest form, Amplitude Modulation (AM), by definition, is the variation in noise level of a given source. This variation (the modulation) occurs at a specific frequency in the case of wind turbines, which is defined by the rotational speed of the blades.

There is a distinction between 'normal' AM of wind turbine noise, characterised as blade swish and Enhanced AM (EAM) or Other AM (OAM), sometimes characterised onomatopoeically as 'thump'. It should be noted that ETSU-R-97 describes and makes allowance for normal AM or blade swish.

A study[96] was carried out in 2007 on behalf of the Department for Business, Enterprise and Regulatory Reform (BERR) by the University of Salford, which investigated the incidence of noise complaints associated with wind farms and whether these were associated with AM. This report defined AM as aerodynamic noise from wind turbines with a greater degree of fluctuation than normal at blade passing frequency. Its aims were to ascertain the

[93] The measurement of low frequency noise at three UK wind farms, Hayes McKenzie, The Department for Trade and Industry, URN 06/1412, 2006

[94] Environment Protection authority (2013) Infrasound levels near wind farms and in other environments [online] Available at: http://www.epa.sa.gov.au/xstd_files/Noise/Report/infrasound.pdf

[95] Bowdler et al. (2009). Prediction and Assessment of Wind Turbine Noise: Agreement about relevant factors for noise assessment from wind energy projects. Acoustic Bulletin, Vol 34 No2 March/April 2009, Institute of Acoustics

[96] Research into aerodynamic modulation of wind turbine noise'. Report by University of Salford, The Department for Business, Enterprise and Regulatory Reform, URN 07/1235, July 2007.

prevalence of increased AM (OAM) on UK wind farm sites, to try to gain a better understanding of the likely causes, and to establish whether further research into AM is required.

The study concluded that OAM had occurred at only a small number (4 of 133) of wind farms in the UK, and only for between 7% and 15% of the time. It also stated that, the causes of OAM were not well understood and that prediction of the effect was not then currently possible.

This research has recently been supported by an in-depth study undertaken by Renewable UK[97], which has identified that many of the previously suggested causes of OAM have little or no association to the occurrence of OAM in practice. The generation of OAM is based upon the interaction of a number of factors, the combination and contributions of which are unique to each site. With the current state of knowledge, the research concludes that is not possible to predict whether any particular site is more or less likely to give rise to OAM, and the incidence of OAM occurring at any particular site remains low, as identified in the University of Salford study. The report includes a sample planning condition to address AM, however that has not yet been validated or endorsed by UK Government or the IOA.

In 2016, the IOA proposed a measurement technique[98] to quantify the level of AM present in any particular sample of wind farm noise. This technique is supported by the Department of Business, Energy & Industrial Strategy (BEIS, formerly The Department of Energy & Climate Change) who have published guidance[99], which follows on from the conclusions of the IOA study in order to define an appropriate assessment method for AM, including a penalty scheme and an outline planning condition. Notwithstanding this, the suggested outline planning condition is as yet unvalidated, remains in a draft form and would require site-specific legal advice on its appropriateness to a specific development.

Section 7.2.1 of the GPG therefore remains current, stating: *"the evidence in relation to 'Excess' or 'Other' Amplitude Modulation (AM) is still developing. At the time of writing, current practice is not to assign a planning condition to deal with AM".*

9.6.2.3 Ground Borne Vibrations

Research undertaken by Snow[100] in 1996 found that levels of ground-borne vibration 100 m from the nearest wind turbine were significantly below criteria for 'critical working areas' given by British Standard BS6472:1992 Evaluation of human exposure to vibration in buildings (1 Hz to 80 Hz), and were lower than limits specified for residential premises by an even greater margin.

Ground-borne vibration from wind turbines can be detected using sophisticated instruments several kilometres from a wind farm site as reported by Keele University[101]. This report clearly shows that, although detectable using highly sensitive instruments, the magnitude of the vibration is orders of magnitude below the human level of perception and does not pose any risk to human health.

9.6.2.4 Construction and Decommissioning Noise

Noise during the Development's construction phase will consist of that generated by on-site activities and noise due to construction traffic on public roads. Whilst the precise location of construction works has yet to be established, the closest noise-sensitive receptor is likely

[97] Wind Turbine Amplitude Modulation: Research to improve understanding as to its Cause and effects, Renewable UK, 2013

[98] Institute of Acoustics, (2016) A Method for Rating Amplitude Modulation in Wind Turbine Noise

[99] BEIS, (2016), Review of the evidence on the response to amplitude modulation from wind turbines

[100] ETSU (1997), Low Frequency Noise and Vibrations Measurement at a Modern Wind Farm, prepared by D J Snow

[101] Microseismic and infrasound monitoring of low frequency noise and vibrations from wind farms: recommendations on the siting of wind farms in the vicinity of Eskdalemuir, Scotland". Keele University, 2005

to be located to the west of the Development, situated approximately 1 km from the closest turbine location, based upon the current scoping layout.

By virtue of the large separation distances and low number of residential receptors in the locality, construction noise impacts are anticipated to be minimal, and will therefore be scoped out of the assessment. Notwithstanding this, the assessment will include a discussion of construction noise guidance, and detail best practice methods for minimising construction noise impact in line with the requirements of BS5228:2009+A1:2014 *Code of Practice for Noise and Vibration Control on Construction and Open sites*.

The effects of noise during decommissioning of the Development are likely to be similar to those during construction. However, both the magnitude and duration of such effects are likely to be less than those during construction.

9.7 Key Questions for the Council / Consultees

- Are consultees content with the proposed methodology and scope of assessment?
- Do the Council and consultees have details of any other wind energy developments in the locality which it considers may raise significant cumulative noise issues? and
- Are consultees content to scope out Low Frequency Noise and Infrasound, Amplitude Modulation, Ground Borne Vibrations and Construction and Decommissioning noise?

10 TRAFFIC AND TRANSPORT

10.1 Introduction

This Section of the Report details the methodology proposed to evaluate the effect of the Development on traffic and transportation resources within the study area. Vehicle movements to the Development will consist of abnormal load vehicles (ALVs), heavy goods vehicles (HGVs), light good vehicles (LGVs) and cars.

The EIA will identify the potential effects from increased road traffic arising from construction, operation and decommissioning of the Development. The significance of these effects will be assessed against recognised guidelines. Where required, appropriate mitigation measures will be proposed to reduce these effects. The access and traffic aspects will consider the effects of the Development on the road network and traffic volumes.

Presently, the origin and route to site for wind turbines and construction materials have not been confirmed; these will be detailed in the EIA Report. This Report outlines the proposed methodology to be employed in the EIA for assessment of Traffic and Transportation effects on the chosen delivery routes and on the wider road network as required.

10.2 Study Area

The Study Area is defined by the public road network in the vicinity of the Development and potential delivery corridors to be used during construction. These take into account the local strategic / Trunk Road network, sources of labour and the potential sources of construction materials, specifically stone and concrete from local quarries.

The Study Area will be further defined in the EIA Report when the route to the Site has been confirmed.

10.3 Assessment Methodology

10.3.1 Overview

The geographic scope of these studies will be confirmed in consultation with the relevant road authorities. However, based on the location identified for the Development, it is anticipated the study will need to encompass the northern section of the A897, the A836 corridor and the A9 corridor which connects Scrabster harbour, the likely port of delivery. All potential receptors along these routes will be considered.

With the exception of the turbine components, the majority of construction traffic is normal construction plant and could include tractors, excavators, rollers, cranes and dumper trucks. Most will arrive on site on low loader transporters. The turbine elements will arrive on specialist transport vehicles.

Baseline traffic flow conditions on routes within the study area will be established and detailed within the EIA. This geographic scope of the baseline assessment will be confirmed in consultation with the Council. As construction vehicles may approach the Development from a distributed set of origins then all routes within the study area will be assessed.

Where publicly available traffic flow information is available, for example from the Department of Transport (DfT), then this will be used as a basis for baseline assessment. Data collated during previous surveys undertaken as part of the 2015 Scoping Report will also inform the baseline assessment.

The assessment methodology will follow the 'Guidelines for the Environmental Impact of Road Traffic'[102]. A screening process using two broad rules outlined in the aforementioned guidelines is used to identify the appropriate extent of the assessment area. These are:

- Include highway links where traffic will increase by more than 30% (or where the number of Heavy Goods Vehicles will increase more than 30%); and
- Include any other specifically sensitive areas where traffic flows have increased by 10% or more.

Where the predicted increase in traffic flows is lower than the thresholds, the guidelines suggest the significance of effects can be stated to be low or not significant and further detailed assessments are not warranted. Peak traffic flows will be identified to assess a worst-case scenario. Assessment of driver distraction will be undertaken as appropriate.

Traffic movements on the public roads resulting from construction will be based on the assessed Development design. Traffic generation will take into account the import of construction materials and the export of surplus materials as well as the movement of equipment, construction plant and labour required during each phase.

Peak traffic flows will be identified to assess a worst-case scenario. An assessment of effects on road safety, driver delay, pedestrian amenity, severance, noise and vibration will be undertaken as appropriate.

In addition to the aforementioned guidance this chapter will take into account the following statutory guidance documents published by the Scottish Government:

- SPP;
- PAN 75 – Planning for Transport[103]; and
- Scottish Government Planning Specific Advice Sheet for Onshore Wind Turbines (last updated December 2013).

It should be noted that the above list may be subject to change in the case that various policies and guidance are replaced or updated during the project. In addition, other relevant guidance required by the Applicant will be considered for inclusion.

Access options from the public road will be investigated as part of the EIA process, including the use and upgrade of existing farm tracks. New tracks would link the existing forest road network to the wind farm site as appropriate. The red line boundary would be amended as required to ensure the final selected route to the public road is included in its entirety.

During the operational phase, volumes of traffic are very limited with occasional peaks resulting from specific major maintenance activities. It is therefore proposed that operational traffic is scoped out of further assessment.

On decommissioning, much of the constructed infrastructure remain in situ. In the case of access tracks, these will likely become a key part in land management and left in an operational condition, and below ground elements such as foundations would be let in place. As such, the construction case is deemed worst case and traffic relating to decommissioning can be scoped out of further assessment.

10.3.2 Assessment of Effects

In assessing traffic effects, we would make use of the findings of the access route study for the physical constraints and measures required for access. It is possible that baseline traffic surveys will be required to supplement existing records. The study would consider effects on:

- Road Users (delay and safety);

[102] Institute of Environmental Assessment (1993) Guidelines for the Environmental Assessment of Road Traffic, IEA.

[103] Scottish Executive (2005) Planning Advice Note: PAN 75 – Planning for Transport , Scottish Executive

- Road Infrastructure (dilapidation); and
- Adjacent community/properties (safety and congestion).

Numerical analyses of delay, etc using network modelling or junction modelling is presently assumed not to be required. The study would only consider effects during construction.

The approach to assessing sensitivity and magnitude of effects is a judgement-based approach as used in recent EIA and the detailed methodology. In terms of road networks, the sensitivity to change in traffic levels of any given road segment or junction is generally assessed by considering the residual capacity of the network under existing conditions. Where there is a high degree of residual capacity, the network may readily accept and absorb an increase in traffic, and therefore the sensitivity may be said to be low. Conversely, where the existing traffic levels are high compared to the road capacity, there is little spare capacity, and the sensitivity to any change in traffic levels would be considered to be high.

The determination of the magnitude of the effects will be undertaken by reviewing the outline proposals for the Development, establishing the parameters of the road traffic that may cause an effect, and quantifying these effects.

In brief, the steps involved in this study would be as follows:

- Consultation with the relevant road authorities and emergency services (the Council, Transport Scotland, Police etc.) as well as any local forestry interests;
- Procure existing traffic data, and arrange additional surveys where necessary
- Carry out route inspections including detailed observations of each community potentially affected by the proposals within the study area. The detailed and numeric assessment would be limited to the roads in closer proximity to the site, i.e. between the A836, A897 and the site entrance;
- Based on the route inspections, sensitive receptors would be identified;
- An initial assessment of traffic generation from the proposed construction works would be undertaken. Assignment of traffic to the network, and an initial assessment of effects. This will be based on professional judgement rather than transportation network modelling;
- Obtain refined project needs, refine traffic generation, and re-assess effects, using obtained baseline traffic data;
- Assess abnormal load movements, including swept path analysis and potential mitigation measures, in order to demonstrate that the selected route is feasible for the size of turbines proposed;
- Assess residual effects following the primary mitigation built in by virtue of the above-mentioned iteration, and any required residual mitigation needs; and
- Identify and assess the potential for cumulative effects based on other known developments.

Formal Traffic Assessments principally relate to developments that generate a significant permanent increase in traffic as a direct consequence of function (for example, retail parks) whereas a wind farm is temporary and the function does not result in a permanent traffic increase, as such it is proposed that a formal traffic assessment is scoped out.

10.4 Baseline Conditions

The Site is located to the east of the A897 road, which connects residential properties and settlements to the south of the Site to the A836 roads and the small settlements of Melvich and Portskerra to the northwest. The A836 continues west from Melvich in the direction of Bettyhill. The A836 east goes on to connect to the small settlement of Reay and joins with the A9 at Thurso. The A836 forms part of the NC500 tourist route. The A897 south provides a connection for further groups of residential properties and settlements and leads to Forsinard railway station after approximately 20 km, eventually joining the A9 at Helmsdale.

A feasible access route for construction, subject to potential mitigation works, has been identified from Scrabster Harbour, west along the A836 to the north of the Site. The A836 has been used by large HGV (including abnormal loads such as wind turbine components) for the construction of other wind farms in the Highlands, and there are no known physical constraints for similar abnormal load movements from expected port of entry. Site surveys undertaken in 2014 for the 2015 Scoping Report, indicated the A836 between the A9 at Thurso and the A897 at Halladale Bridge to be a good standard road with no evident vertical or horizontal geometrical constraints. The A897 is a single carriageway with passing places at regular intervals, but of sufficient width to accommodate the expected wind farm traffic without significant improvement. Route 1 of the National Cycle Network follows the route of the A836 towards Thurso via the B874. There are narrow footways focused around settlements along the A836, but no footways along the A897. As detailed design and access studies are progressed, any requirement for local improvements to the proposed public road access route would be addressed.

Traffic flow data for the A836 has not been requested from the Council at this stage. Baseline traffic count data for the A836 would be requested from the Council early in the detailed assessment of traffic effects.

10.5 Key Sensitivities

The main sensitives relating to the Development are considered to be:

- Increase in HGV traffic;
- Delay related to the movement of abnormal loads;
- Abnormal road wear and tear; and
- Road widening/improvements to accommodate abnormal loads.

10.6 Potential Effects and Assessment

10.6.1 Permanent

There is not predicted to be any permanent impact on the road network in the area taking account of the scale of the proposals and the number of anticipated heavy loads. Depending on further site surveys, some minor improvement works to A836 and the formation of a new access from either the A836 or the A897 to the wind farm site will be required. More detailed analysis of the A836 and A897 would be undertaken during detailed design to identify the requirement for any improvements to public roads to provide a safe access for construction vehicles and abnormal loads.

10.6.2 Construction

The volume of construction site traffic is unlikely to cause any significant disruption to traffic, cyclists or other road users in the area as all roads are relatively lightly trafficked and capable of accommodating the short term increases in traffic associated with wind farm construction. The small number of abnormal loads required to deliver turbine components would be escorted during off peak periods to cause minimal temporary disruption to other road users.

The indirect effects of temporary increases in traffic on sensitive roadside receptors such as residential properties would be considered as part of the detailed noise and air quality studies for the EIA. The anticipated increase in daily traffic movements from construction vehicles would be compared with baseline flows and an assessment of the potential for amenity effects undertaken based on the predicted percentage changes in flows. On the basis of current information on construction traffic generation, it is not expected that levels of generated traffic would result in significant noise or air quality changes for such receptors

although there may be some short-term loss of general amenity during busier periods of HGV deliveries.

10.6.3 Scoped In Effects

The following aspects will be assessed when considering the effects of the Development on traffic and transportation:

- Traffic generation;
- Hazardous Loads;
- Accidents and Safety;
- Driver Delay;
- Pedestrian Amenity; and
- Severance.

10.6.4 Scoped Out Effects

It is proposed that a formal Transport Assessment is scoped out as the Development will not give rise to a permanent increase in traffic numbers.

On the basis of current information on construction traffic generation, it is not expected that levels of generated traffic would result in significant noise or air quality changes for such receptors although there may be some short-term loss of general amenity during busier periods of HGV deliveries; however, this would not be significant and can be scoped out of the assessment.

During the operational phase, volumes of traffic are very limited with occasional peaks resulting from specific major maintenance activities. It is therefore proposed that operational traffic is scoped out of further assessment. Thus, the construction phase is deemed worst case and traffic relating to decommissioning can be scoped out of further assessment.

10.7 Key Questions for the Council / Consultees

The above scope is based on the requirement for EIA to consider the likely significant effects. Effects that are not likely significant do not require assessing under the EIA Regulations.

Key questions for consultees are:

- Are Consultees content with the proposed methodology and scope of the traffic and transport assessment?
- Are the Council/Statutory Consultees aware of any specific access restrictions or limitations on the proposed abnormal loads route? and
- Are Consultees content to scope out operational and decommissioning traffic from further assessment?

11 HYDROLOGY AND HYDROGEOLOGY

11.1 Introduction

This Section provides an appraisal of the potential hydrological and hydrogeological constraints associated with a development at the Site. This appraisal is based on publicly available resources and our knowledge of the Site and of wind farm developments in the local area.

11.2 Study Area

The following study areas will be considered as part of the assessment within the EIA Report:

- Core Study Area: comprising the Site boundary;
- Wider Study Area: within 10 km of the Site boundary. Due to potential for dilution and attenuation of potentially polluting chemicals and sediment it is considered that the potential for effects beyond this distance is limited; and
- Private Water Supply (PWS) Study Area: PWS will be identified within 2 km of the Site boundary. Beyond 2 km, it is considered that potential for hydrological connectivity is limited.

11.3 Assessment Methodology

A site walkover, consultation, desk studies and data requests will be undertaken to inform the baseline and assessment.

The following activities will be undertaken to inform the hydrological and hydrogeological assessment:

- Review of published data and maps;
- Consultation with SEPA, the Council and the British Geological Survey (BGS);
- Identification of solid and surface geologies;
- Review of Pollution Prevention Guidelines;
- Identification of surface water features, catchments and GWDTEs;
- Preparation of a catchment plan;
- Identification of data on public and private abstractions and supplies, and risk assessment of these;
- Identification of other similar developments within 10 km;
- Collation of flood plain information, water quality data and groundwater vulnerability information;
- Production of a Water and Construction Environmental Management Plan (WCMP); and
- Concise section within the EIA Report to assess Flood Risk.

The EIA Report chapter will describe the potential effects of the Development including:

- Details of consultation undertaken;
- Assessment methodologies for construction and decommissioning phases;
- Hydrological walkover survey details and results;
- Assessment of the operational and decommissioning phases of the project to establish the effect on the hydrological resource;
- Identify mitigation measures, where necessary;
- Identify any residual effects following mitigation;
- Cumulative assessment with other developments within 10 km of the Development; and
- Statement of significance in accordance with the EIA Regulations.

11.4 Baseline Conditions

An initial review of the hydrological conditions of the Development site has been undertaken. This Section outlines the potential hydrological and hydrogeological receptors which have been identified within the Site and the wider catchment in which the Site is located.

11.4.1 Surface Hydrology

The Site lies within the catchment of the Akran Burn, the Giligill Burn and an unnamed watercourse.

The Akran Burn issues from Caol Loch which is located just to the southwest of the Site and Akran Loch 1.4 km south of the Site. The Akran Burn flows through the southwestern section of the Site before flowing into the Halladale River 0.5 km west of the Site.

The Giligill Burn rises in the southeast of the Site before flowing northwest and converging with the unnamed watercourse at the Site's western boundary before flowing into the Halladale River 1.4 km west of the Site.

The unnamed watercourse rises within the centre of the Site before flowing northwest and flowing into the Giligill Burn.

The Halladale River has a SEPA overall status of "Moderate". The Halladale River flows into the North Sea, approximately 1.7 km northwest of the Site.

Site surveys will ground truth the presence of watercourses and drainage features.

Appropriate buffers will be applied to watercourses and drains during the design phase.

11.4.2 Hydrogeology

The groundwater units underlying the Site are identified by Scotland's Environment mapping service as the Northern Highlands and Fresgoe groundwater bodies[104]. These units have an overall SEPA classification of 'Good'.

BGS 1:625,000 digital mapping and the BGS GeoIndex shows the bedrock aquifer underlying the majority of the Site to consist of magmatic psammites and magmatic semipelites of the Moine Supergroup. These rocks are classified by the BGS as "low productivity aquifer" with small amounts of groundwater in the near-surface weathered zone and secondary fractures. The northernmost section of the Site is underlain by sandstone, siltstones and conglomerates of the old red sandstone group which are classified by the BGS as "moderately productive aquifer" comprising locally important multi-layered aquifer.

An assessment the potential effects on the groundwater resource will be undertaken in the EIA Report.

11.4.3 Groundwater Dependent Terrestrial Ecosystems

The location, type and extent of the GWDTEs has been determined with the aid of a NVC survey, which is provided as Appendix C to this Scoping Report. The Phase 1 shows that two NVC communities are located within the Development site that have moderate and high groundwater dependency: M15 and M25; however, the majority of the site is dominated by M17, which is not classified as a GWDTE. An assessment of the hydrological function of the GWDTEs and potential effects from the Development will be undertaken in accordance with Land Use Planning System Guidance Note 31, Version 2, (SEPA, 2014).

[104] Scottish Government Scotland Environment Map. Available at: https://map.environment.gov.scot/sewebmap/ (Accessed 26/03/2019)

11.4.4 Designated Hydrological Receptors

Review of SNH GIS datasets available through the Scotland's Environment mapping service was used to identify statutory designated sites related to the water environment within 10 km of the Site boundary. Statutory designated sites are detailed in Table 11.1.

Table 11.1: Statutory Designated Sites within 10 km of the Site boundary.

Designation	Qualifying Interest	Hydrological Connectivity to the Development
East Halladale SSSI	Blanket Bog	Yes – Located adjacent southeast of the Site
Caithness and Sutherland Peatlands SSSI, SAC, SPA and Wetland of International Importance (Ramsar)	Blanket Bog, breeding birds	Yes – located adjacent southeast of the Site
Strathy Coast SSSI	Saltmarsh and plant assemblages	Yes – c. 0.7 km northwest of the Site
Red Point Coast SSSI	Breeding guillemot	Yes – c. 1.3 km north of the Site
North Caithness Cliffs SPA	Breeding birds	Yes – c. 1.4 km north of the Site
West Halladale SSSI	Blanket Bog	No – c. 2.62 km west of the Site

11.4.5 Private and Public Water Supplies

A 2 km search radius from the Site boundary was used to request information on the location, type and source of private water supplies from the Council. PWS identified by the Council are detailed in Table 11.2.

Table 11.2: PWS identified by the Council within 2 km of the Site Boundary

PWS	Source Type	Comments
Kirkton Farm	Surface Water	1.1 km west of the Development Boundary
Kirkton Farm Cottage	Surface Water	1.1 km west of the Development Boundary
Fishery Cottage	Unknown	1.4 km northwest of the Development boundary
The Net Store	Unknown	1.4 km northwest of the Development boundary

Residents with PWS as identified by the Council will be contacted to ascertain the location of PWS infrastructure in order for this to be considered during the Development design and assessed in the EIA Report.

11.4.6 Flooding

The Indicative River and Coastal Flood Map (Scotland) produced by SEPA shows the areas of Scotland with a 0.5 % (1:200) or greater chance of flooding. These areas are known as medium to high risk areas for flooding.

The SEPA Flood Map shows that minor areas either side of the Akran Burn in the south western section of the Site is classed as having a "High" annual probability of river flooding in any year.

Caol Loch in the south of the Site is classed as having a "High" annual probability of surface water flooding in any year.

The flood maps show flooding is restricted to the waterbodies and do not indicate widescale flooding across the Site.

An initial 50 m buffer will be placed around watercourses onsite as measured from the banks; therefore, it is not anticipated that turbines or electrically sensitive equipment will be located within these areas of potential flood risk. As such, a concise section within the EIA Report will consider whether the Development is at risk of flooding and if the Development will impact surface water run-off and effects on off-site receptors, in accordance with paragraphs 255 to 268 of the SPP.

11.5 Key Sensitivities

At this stage, the key sensitive receptors are considered to be the Akran Burn, unnamed watercourse, Giligill Burn and their tributaries, groundwater, designated hydrological receptors, the hydrological function of potential GWDTEs and Private Water Supplies.

11.6 Potential Effects and Assessment

Information from residents pertaining to private and information from Scottish Water pertaining to public water supplies is yet to be received but will form part of the baseline data requests.

Potential impacts could occur from:

- Chemical pollution;
- Sedimentation as a result of construction;
- Acidification of watercourses;
- Impediments to watercourse and near-surface water flow;
- Increased run-off and flood risk;
- Potential changes in soil and peat interflow patterns;
- Migration of pollutants from contaminated land; and
- Compaction of superficial deposits.

The predicted significance of impacts will be determined through a source-pathway-receptor method and will be based on professional judgement, considering both the sensitivity of receptor and the magnitude of the potential impact.

11.6.1 Scoped In Effects

The following aspects will be assessed when considering the effects of the Development on hydrology and hydrogeology:

- Chemical pollution;
- Sedimentation as a result of construction;
- Potential effects on PWS within 2 km;
- Potential effects on the hydrological function of GWDTEs;
- Impediments to watercourse and near-surface water flow;
- Acidification of Watercourses;
- Increased run-off and flood risk; and
- Compaction of superficial deposits.

11.6.2 Scoped Out Effects

It is proposed that the migration of pollutants from contaminated land is scoped out of the assessment as the Site has not previously been developed and it is unlikely contaminated land will be encountered.

It is proposed that effects of the Development on West Halladale SSSI are scoped out of the assessment as there is no hydrological connectivity between the Development and this receptor.

There is limited potential for pollution and sedimentation effects on the water environment at distances greater than 10 km and it is proposed that receptors beyond this distance are scoped out.

11.6.3Cumulative effects

An assessment of other developments which have the potential to overlap with the construction phase of the Development will be considered within the EIA Report.

The methodology followed to assess the cumulative effects will be the same as that used for the Development in isolation.

11.6.4Embedded Design Measures

A 50 m buffer zone will be established for all turbine bases and ancillary structures / infrastructure around the watercourses on the Site, as measured from their banks, where possible.

The requirement for access tracks crossing watercourses will be minimised, where possible, during the design stage.

A Water Construction Management Plan (WCMP) will accompany the EIA Report and form part of the embedded development design. The WCMP will comprise methods and works that are established and effective measures to which the Applicant will be committed through the development consent. Accordingly, the assessment of significance of effects of the Development should be considered with the inclusion of the WCMP.

Measures in order to protect the water environment will be outlined in the WCMP and will be based on good construction practice outlined in the following documents:

- Pollution Prevention Guidelines (PPGs and GPPs) 1 to 21;
- SNH (2015), Good Practice During Wind Farm Construction;
- The Construction Industry Research and Information Association (CIRIA) (2015), Environmental Good Practice on Site (C741); and
- CIRIA (2001), Control of Water Pollution from Construction Sites (C532).

11.7 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Do the Council and the consultees agree with the proposed methodology and scope of the hydrology and hydrogeology assessment? and
- Does the Council, SNH, SEPA or other consultees have any information that would be useful in the preparation of the hydrology and hydrogeology assessment?

12 GEOLOGY AND PEAT

12.1 Introduction

An assessment of the impact of the Development on geology and peat will be undertaken. This will establish the baseline conditions, inform the assessments and design whilst determining any suitable mitigation measures required.

12.2 Assessment Methodology

The purpose of this assessment will be to:

- Define the peat extent, depth and properties across the Site;
- Assess the potential effects on peat disturbance;
- Assess the potential for peat destabilisation through identification of areas susceptible to peat slide, using peat thickness and digital terrain model (DTM) data to analyse slopes;
- Advise on the micrositing of turbines and tracks to areas of shallow or no peat; and
- Develop an acceptable code for construction that will adopt best practice procedures, effective management and control of onsite activities to reduce or offset any detrimental effects on the geology and soils including peat.

12.2.1 Peat Probing

Peat Probing comprises two phases, a preliminary phase (Phase 1) and a more detailed exercise once the proposed infrastructure has been defined (Phase 2). Phase 1 peat probing (Figure 12.1) has been undertaken comprising a 100 m centre grid which will be supplemented by Phase 2 peat probe survey works which will focus on the design freeze site layout. Phase 2 peat probing survey will be undertaken at 50 m centres along tracks and at 25 m spacing either side to allow for micro-siting. Peat probing will also be undertaken at 10 m centres at each turbine location.

This approach is in accordance with Scottish Government's guidance on Peat Landslide Hazard and Risk Assessments[105]. The information gathered during peat probing will be utilised in preparation of Peat Landslide Hazard and Risk Assessment and outline Peat Management Plan

12.2.2 Peat Slide Risk Assessment

Due to the presence of peat within the Site, a Peat Slide Risk Assessment will be undertaken in accordance with Scottish Government guidance[106] and in consultation with the relevant consultees.

The Peat Slide Risk Assessment will comprise of detailed analysis and reporting on the design freeze and will include a hazard and slope stability assessment and preliminary peat management recommendations.

The hazards existing on the site will be ranked based on factors that influence stability, namely peat depth and slope gradient. In addition, receptors exposure to potential risk will be established and hazard rankings applied across the site, with management and mitigation measures recommended for an acceptable construction.

[105] Scottish Government (2017) Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments. Available at: http://www.gov.scot/Publications/2017/04/8868/0 [Accessed 08/02/2019]
[106] *Ibid*

12.2.3 Outline Peat Management Plan

Arcus will prepare an outline peat management plan which will include high level estimation on peat excavation and re-use volumes. This will be based on the approximate infrastructure dimensions and anticipated re-use streams. This will:

- Define the materials that will be excavated as a result of the Development, focusing specifically on the excavation of peat;
- Determine volumes of excavated arisings, the cut/fill balance of the Development and proposals for re-use or reinstatement using excavated materials; and
- Detail management techniques for handling, storing and depositing peat for reinstatement.

12.3 Baseline Conditions

British Geological Survey (BGS) survey mapping indicated the superficial soils underlying the site be dominated by Glacial deposits, comprising of sand, gravel and boulders. Localised pockets of Peat were noted across the site.

Bedrock geology mapping indicated that the site was underlain by Migmatitic Psammite with Migmatitic Semipelite of Portskerra Psammite formation.

During a recent site walkover, quarrying activities was noted within the western extremities of the redline boundary, conjectured to be a sand quarry. Further details of the quarrying activities will be sought from the landowner and the local authority, as necessary.

12.4 Field Surveys

Preliminary peat probing comprising 100 m centre grid was undertaken as part of the initial EIA survey works in March 2019. During the survey works a total of 267 probes were completed.

Peat was found to be deepest in the flatter, topographically low-lying areas of the Site where depths extended to 3.5 m and 4.1 m in the northwest and southeast respectively, while much of the remainder of the Site was recorded between 0.1 m and 1.0 m.

Figure 12.1 illustrates the 'Interpolated Peat Depths'.

12.5 Key Sensitivities

At this stage, the main key sensitivities are considered to be:

- Soil type and associated land use (e.g. peat/blanket bog);
- Class 1 or 2 priority peatland, carbon-rich and peaty soils; and
- GWDTEs.

12.6 Potential Effects and Assessment

12.6.1 Peat Slide Risk

Development of wind farms on peatlands can lead to potential peat slide risk. An assessment of the likely impact on peatlands and the potential for peat slide risk will be undertaken and included as a Technical Appendix within the EIA Report.

12.6.2 Impact on Peatland Habitat

Excavation of peat during construction of site infrastructure, including access tracks, crane hardstandings, turbine foundations and cable trenches may lead to potential impacts on any peat habitat. In addition, natural surface drainage systems may change in this regard which could lead to drying and oxidation of in-situ peat.

12.6.3Peatland Disturbance

Disturbance of organic rich peat soils leading to carbon loss. Carbon effects are discussed in more detail under the Climate Change Impact Assessment (CCIA), Section 14 of this Report.

12.6.4Scoped In Effects

The potential effects that are to be considered during the assessment are:

- Potential peat slide risk to;
  - Inform the assessment of effects on peatlands;
  - Inform outline management measures for excavation and re-use of peat and peaty soils; and
- Details of embedded mitigation and restoration relative to Geology and Soils

12.6.5Scoped Out Effects

The solid geology of the Site influences the site design and is not likely to receive a significant effect as a result of the Development as the geology is not protected or of designated regional importance; therefore, no significant change to the geology or mineral deposits is anticipated. It is therefore proposed to scope out the effects on solid geology from any further assessment.

The SEPA Waste Map has not identified any areas of contaminated land within the Core Study Area and no effects are anticipated. Should potentially contaminated land be encountered during excavations, this would be tested and appropriate action taken in accordance with The Environmental Protection Act 1990. Potential effects arising from contaminated land have, therefore, been scoped out of this assessment.

12.7 Key Questions for the Council / Consultees

The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Do the consultees agree with the proposed methodology and scope of the Geology and Peat Assessment?
- Do the consultees have any information that would be useful in the preparation of the Geology and Peat assessment, including details of local quarrying activity?

13 LAND USE, SOCIO-ECONOMICS AND TOURISM

13.1 Introduction

The land use, socio-economic and tourism chapter of the EIA Report will bring together these related assessments of the likely socio-economic impact of the Development upon the population, economy and use of the land within and around the Development. This section sets out the proposed approach that will be taken in the assessments, together with a summary of information that is currently available.

13.2 Assessment Methodology

There is no specific legislation or guidance available on the methods that should be used to assess the socio-economic impacts of a proposed renewable energy development. The proposed method has however, been based on established best practice, including that used in the UK Government and industry reports on the sector. In particular, this assessment will draw on two studies by BiGGAR Economics on the UK onshore wind energy sector, a report published by RenewableUK and 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. A desktop socio-economic assessment will consider the potential direct and indirect effects of the Development. An estimate of economic benefits will be provided in the EIA Report.

There is also no formal legislation or guidance on the methods that should be used to assess the effects that renewable energy development may have on tourism and leisure interests. The proposed method would consider individual attractions and tourism facilities to assess if there could be any effects from the Development. Public perception surveys and literature considering the views of tourists visiting areas containing windfarms and local communities living near to wind farms will also be reviewed as part of this assessment.

13.3 Baseline Conditions

13.3.1 Land Use

The Site consists of gently undulating and sloping rural farm and moorland. There is a small area of improved pasture in the north-west. There is a small area of established young forestry (~10 years old) along the farm track leading from Ackron Farm. This area of woodland within the Site extends to the north along the western boundary of the Site; these areas are surrounded by deer fences and are not included within the Site Boundary. There is no existing forestry management plan in place for the woodland within the Site as it was planted as part of the Scottish Forestry Grants Scheme. The remaining portions of the Site are moorland, used for the rough grazing by sheep. There is evidence in the northern part of the site, along the Giligill Burn, of previous peat cutting activity.

Field boundaries within and close to the site are mainly post and wire deer fencing with some drystone dykes. There is evidence of drainage ditches within the moorland, which generally run to the north and west across the central part of the site.

There are no residential properties within the Site and few properties within 2 km (i.e. Ackron Farm, Golval and Kirkton properties). A quarry is located directly adjacent to the south-west of the Site.

Whilst there may be some disruption to land use during construction, this would be temporary and short term, and it is expected that the aforementioned land uses would continue across the Site once the Development is operational. Due to the limited forestry located within the Site Boundary, the design will seek to avoid the forestry along the farm road in the western portion of the Site, where feasible. Should there by a requirement to fell forestry, consultation would be undertaken with Scottish Forestry to agree

compensatory planting either onsite or likely within the landowner's holdings, and the ecological effects of felling would be considered within the ecology assessment. As such, changes to land use resulting in a significant effect would not occur and can be scoped out of the assessment.

13.3.2Economy

The Development is located approximately 2 km east of Melvich and 18 km west of Thurso in Sutherland, in the administrative area of the Highland Council. The location of the Site is shown in Figure 1.1. The Development will result in contract opportunities for local and regional contractors both for construction activities themselves and throughout the supply chain. The investment in the Development has the potential to generate a range of beneficial economic and social effects and opportunities for local businesses, most notably employment opportunities and local spending

Settlements within the 5 km study area, including Melvich, Reay and Portskerra, will be considered as part of the assessment. As such, an assessment of socio-economic effects will be included in the EIA Report.

13.3.3Tourism & Recreation

The Site is accessible via the Land Reform Act (Scotland) 2016[107]; however, as the Site is not promoted for public access, all access is informal. There are no access roads suitable for mountain bikers, hikers and horse riding within the Site Boundary and no recognised footpaths.

The Development is located near the coastline in Sutherland (approximately 1.5 km from the coastline), a location popular for tourism and recreational activities such as walking, cycling and boating.

The closest formal tourist attraction with the Study Area is the NC500 tourist route which runs along the A836. The concept of the NC500 was established to encourage visitors to the Highlands[108], and local bed and breakfasts, hotels and restaurants have all benefited from the promotion of the route.

There are no other formal tourist attractions within 5 km of the Development.

A desk study will be conducted to identify any local, national and regional tourism receptors that may be affected by the Development. Key attractions will be identified through consultation and from online sources including the VisitScotland and Undiscovered Scotland websites. Key accommodation receptors will be identified through desk-based research. In addition, local knowledge gained through public consultation and site visits will be incorporated into the assessment wherever relevant.

There are no footpaths or recreational routes within the Site; however, a number of footpaths and recreational routes exist within 5 km of the Site, as summarised in Table 13.1 below.

[107] Scottish Government (2016) Land Reform Act (Scotland) 2017. [Online] Available at: http://www.legislation.gov.uk/asp/2016/18/contents (Accessed 05/03/2019)

[108]North Coast 500 (2015) About NC500 [Online] Available at: https://www.northcoast500.com/about-nc500/ (Accessed 23/03/2019)

Table 13.1: Identified Public Rights of Way

Type of Route	Status of Route	Route Name	Distance and Direction from Site
Highland Council CP	Local	CA11.03 Borlum Rock	4.5 km E
Highland Council CP	Local	CA11.04 Sandside Head	4.4 km NE
Highland Council CP	Local	CA11.05 Achins/Helshetter	3.3 km NE
Highland Council CP	Local	CA11.06 Reay Roadside Link	3.7 km NE
Highland Council CP	Local	CA11.07 Reay Golf Course via Mary's Cottage	4.7 km NE
Highland Council CP	Local	CA11.08 Reay Golf Couse via Clubhouse	4.2 km NE
Highland Council CP	Local	CA11.09 Limekiln Circuit	4.4 km NE
Highland Council CP	Local	SU19.01 Portskerra Coast Walk	2.8 km NW
Highland Council CP	Local	SE19.03 Kirkton – Upper Bighouse	1.4 km SW
Highland Council CP	Local	SU19.05 Melvich Beach	1.3 km NW
Highland Council CP	Local	SU19.08 Bayview Terrace – Low Road	3.1 km NW

The Development may affect recreational amenity value of other recreational and tourism resources in the area. An assessment of the potential for the Development to affect other recreational receptors and change the recreation use of the Site and surrounding area will therefore be undertaken. This will utilise the findings of the LVIA (Section 5 of this Report) and will also consider cumulative effects resulting from the Development in conjunction with other wind farms.

Effects on nearby tourism and recreation receptors will be considered in detail where direct effects are predicted. Direct effects include effects such as temporarily diverting a public right of way during the construction phase of the Development. Indirect effects on any tourism or recreation receptors derive from visual effects that will be considered as part of the LVIA, and the findings of the LVIA will inform an assessment of the effect on the wider experience of the receptors under this topic heading within the EIA Report.

13.4 Potential Effects and Assessment

The scope is based on the requirement for EIA to consider the likely significant effects. Effects that are not likely significant do not require assessing under the EIA Regulations.

13.4.1 Scoped In Effects

Effects upon socio-economics and recreation and tourism will be included within the EIA Report.

13.4.2 Scoped Out Effects

As there will be no significant change to land use as a result of the Development, consideration of land use, including forestry, is scoped out of the assessment.

13.5 Key Questions for the Council / Consultees

Key questions for consultees are:

- Do Consultees agree with the proposed method of assessment?
- Are Consultees aware if any additional sensitive economic activities in the area that would not be covered in the proposed method of assessment?
- Are Consultees aware of any key sensitive receptors that might be relevant to likely significant effects? and
- Are Consultees aware of any additional relevant consultees?

14 CLIMATE CHANGE AND CARBON BALANCE

14.1 Introduction

The aim of the Climate Change Impact Assessment (CCIA) section is to determine how the Development is likely to interact with a changing climate and whether any significant effects could arise. CCIA is a relatively new form of environmental assessment required by the amended EC Directive 2014/52/EU[109].

This Section of the Report sets out the proposed approach to the assessment of potential effects of the Development on climate change and carbon balance as a result of the construction and operation of the Development.

14.2 Assessment Methodology

In 2017, IEMA published the 'Environmental Impact Assessment Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance'[110]. Accordingly, the proposed CCIA methodology was developed in line with the 2017 IEMA guidance, in order to establish a comprehensive assessment methodology. The methodology focusses on the following elements:

- Assessment of the Development's effects on climate change (calculation of carbon footprint) based on best practice guidelines, i.e. Scottish Government Carbon Calculator Tool[111] to include calculation of greenhouse gas emissions relating to construction and operation and the production of electricity;
- Assessment of the Development's vulnerabilities and resilience in the context of climate change by identifying appropriate climate change projects and climate change effects; and
- Assessment of the Development's effects upon identified environmental receptors in the context of the emerging baseline.

The input values to the Scottish Government Carbon Calculator Tool will be set out and justified. The pages of the Tool itself will be provided as an Appendix to the EIA Report.

14.3 Baseline Conditions and Potential Effects

The most recent climate change project iteration, UKCP18[112] has identified the following climatic trends as a result of climate change:

- Increased temperature;
- Changes in the frequency, intensity and distribution of rainfall events (e.g. an increase in the contribution to wind rainfall from heavy precipitation event and decreases in summer rainfall);
- Increased wind storms; and
- Sea level rise.

Potential effects include:

- Effects of the Development on climate change;
- Effects of climate change on the Development; and

[109] European Commission (2014) Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment [Online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0052 (Accessed 05/03/2019)

[110] IEMA (2017) Assessing Greenhouse Gas Emissions and Evaluating their Significance [Online] Available at: https://www.iaia.org/pdf/wab/EIA%20Guide_GHG%20Assessment%20and%20Significance_IEMA_16May17.pdf (Accessed 05/03/2019)

[111] Scottish Government (2018) Carbon Calculator Tool v1.4.0. [Online] Available at: https://informatics.sepa.org.uk/CarbonCalculator/index.jsp (Accessed 05/03/2019)

[112] Met Office (2018) UK Climate Projections. Available at https://www.metoffice.gov.uk/research/collaboration/ukcp (Accessed 26/03/2019)

- Effects of climate change assessments made in other topics of the EIA.

The Development will be inherently designed to reduce adverse climate change effects by offsetting the production of carbon dioxide through use of renewable sources for generating electricity. The current baseline with respect to greenhouse gas emissions from existing methods of electricity generation will be identified using existing data from the Government, operational sites, and experience of other similar developments. This information will provide the baseline information against which to assess the contribution of the Development to reducing greenhouse gas emissions and potential for significant effects. The effects of the Development on climate change are scoped into the EIA.

It is proposed that the Development's vulnerabilities and resilience to climate change can be scoped out of the EIA. None of the identified climate change trends listed above could affect the Development with the exception of increased wind storms. Braking mechanisms installed on turbines allow them to be operated only under specific wind speeds and should severe wind storms be experienced then the turbines would be shut down. Therefore, climate change is not expected to have a significant effect on the Development, and this topic can be scoped out.

The EIA Report chapter will summarise, for each EIA topic, the potential for the various parameters subject to climate change to alter the assessment of effects, so this aspect is scoped into the EIA.

14.3.1 Scoped In Effects

The Carbon Calculator Tool will be used to determine how the Development affects climate change.

Effects of climate change on environmental receptors identified in other EIA topics will be considered in a future climate scenario, as predicted by UKCP18.

14.3.2 Scoped Out Effects

All assessment regarding the Development's vulnerability and resilience to climate change.

14.4 Key Questions for the Council / Consultees

The above scope is based on the requirement for EIA to consider the likely significant effects. Effects that are not likely significant do not require assessing under the EIA Regulations.

Key questions for consultees are:

- Are consultees content to scope out the Development's vulnerabilities and resilience to climate change? and
- Are consultees content with the proposed method of assessment?

15 OTHER ISSUES

15.1 Introduction

An Other Issues chapter in the EIA Report will assess the likely impact of the Development upon receptors surrounding the Site which are not covered in other technical disciplines.

This Section of the Report sets out the proposed approach in respect to additional assessments that are required in order to provide a comprehensive assessment of the likely environmental impacts of the Development, together with a summary of the baseline based on information that is currently available.

15.2 Health and Safety, including Major Accidents & Disasters

The EIA Regulations state that an EIA must identify, describe and assess in an appropriate manner, the expected effects deriving from the vulnerability of the Development to risks, so far as relevant to the Development, of major accidents and natural disasters.

Relevant information available and obtained through risk assessments pursuant to legislation of the European Union such as Directive 2012/18/EU of the European Parliament[113] on the control of major accident hazards involve dangerous substances. The Directive lays down rules for the prevention of major accidents which might result from certain industrial activities and the limitation of their consequences for human health and the environment. Directive 2012/18/EU requires the preparation of emergency plans and response measures which will be covered under equivalent documents relevant to the nature of the Development. Throughout all phases of the Development, cognisance should be made through the following guidance documents produced by Renewable UK:

- Wind Turbine Safety Rules Third Edition[114];
- Guidance & Supporting Procedures on the Application of Wind Turbine Safety Rules Third Edition[115]; and
- Onshore Wind Health & Safety Guidelines[116].

Health and Safety during the construction and decommissioning phases of the Development will be subject to relevant legislation and best practice. This will involve site inductions, risk assessments, and method statements as implemented by the Construction Management Plan (CMP). Therefore, there is no further requirement for Health and Safety to be assessed within the EIA and is scoped out of further assessment.

The risk of a major accident could be increased by the probability of natural disasters associated with the location of the Development. This should be considered during the preparation of major accident scenarios.

The Development is not located within an area known for natural disasters such as floods, hurricanes, tornadoes, volcanic eruptions, earthquakes or tsunamis. As the most probable of natural disasters to affect the Development, flood risk will be assessed within the hydrological assessment in the EIA Report. It is noted that the Development is not located in an area prone to flood risk.

[113] European Union (2012) Directive 2012/18/EU [Online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32012L0018 (Accessed 26/03/2019)

[114] Renewable UK (2015) Wind Turbine Safety Rules. Third Edition. [Online] Available at: https://c.ymcdn.com/sites/www.renewableuk.com/resource/resmgr/Docs/Health_&_Safety/WindTurbineSafetyRulesIssue3.pdf (Accessed 26/03/2019)

[115] Renewable UK (2015) Guidance & Supporting Procedures on the Application of Wind Turbine Safety Rules. Third Edition [Online] Available at: https://c.ymcdn.com/sites/www.renewableuk.com/resource/collection/AE19ECA8-5B2B-4AB5-96C7-ECF3F0462F75/Wind-turbine-safety-rules-guidance.pdf (Accessed 26/03/2019)

[116] Renewable UK (2015) Onshore Wind Health and Safety Guidelines [Online] Available at: https://c.ymcdn.com/sites/www.renewableuk.com/resource/collection/AE19ECA8-5B2B-4AB5-96C7-ECF3F0462F75/OnshoreWind_HealthSafety_Guidelines.pdf (Accessed 26/03/2019)

None of the identified climate change trends listed will affect the Development with the exception of increased windstorms. Risks associated with ice build-up, lightning strike and structural failure are removed or reduced through inbuilt turbine mechanisms in modern machines. Brake mechanisms installed on turbines allow them to be operated only under specific wind speeds and should severe windstorms be experienced then the turbines would be shut down. Although an unlikely event in the area, the brake mechanisms could also apply to a hurricane scenario.

The Development is not located within an area prone to such disasters and the likelihood of such an event is extremely rare. Therefore, it is concluded that no significant effects will arise due to health and safety including major accidents and natural disasters as a result of the Development, and this topic can be scoped out of the EIA.

15.3 Shadow Flicker

Under certain combinations of geographical position and time of day, the sun may pass behind the rotors of a wind turbine and cast a shadow over neighbouring properties. Shadow flicker is an effect that can occur when the shadow of a blade passes over a small opening (such as a window), briefly reducing the intensity of light within the room, and causing a flickering to be perceived. Shadow flicker effects can only occur inside buildings when the blade casts a shadow across an entire window opening.

Due to the lack of explicit guidance in Scotland, guidance within England is considered to be material for assessing shadow flicker effects. Guidance produced by the UK Government, 'Planning Practice Guidance for Renewable and Low Carbon Energy[117] states that "o*nly properties within 130 degrees either side of north, relative to the turbines can be affected at these latitudes in the UK- turbines do not cast long shadows on their southern side.*" In addition, the Online Scottish Planning Guidance Note[118] on onshore wind provides information on shadow flicker. It states: "*where separation is provided between wind turbines and nearby dwellings (as a general rule 10 rotor diameters), "shadow flicker" should not be a problem.*" However, the Council states that wind energy developments should be *"located a minimum distance of 11 times the blade diameter of the turbines from any regularly occupied buildings not associated with the development. Within a distance less than 11 times the blade diameter, a shadow flicker assessment will be required[119]."* This increase in distance from the established 10 is to account for northern latitudes in the Highlands and is in line with the conclusions of the DECC Update of UK Shadow Flicker Evidence[120]. Since the final layout and candidate turbine have yet to be selected, it is difficult to determine whether or not the Development will have a significant effect on the surrounding properties from shadow flicker.

An assessment will be undertaken to determine whether or not there will be any impacts on surrounding properties and the results of the assessment will be included in the EIA Report. This will examine all properties which lie within 11 rotor diameters and 130 degrees either side of north from each turbine. Resoft WindFarm, a computer modelling programme, will be used to model the potential effects at surrounding properties to quantify the potential effects.

[117] DCLG (2013). Planning Practice Guidance for Renewable and Low Carbon Energy. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/225689/Planning_Practice_Guidance_for_Renewable_and_Low_Carbon_Energy.pdf [Accessed 01/03/2019]

[118] DECC (2011) Update of UK Shadow Flicker Evidence Base [Online] Available at: https://www.gov.uk/government/publications/update-of-uk-shadow-flicker-evidence-bas e (Accessed 23/03/2019)

[119] The Highland Council (2016) Onshore Wind Energy: Supplemental Guidance. Available at https://www.highland.gov.uk/downloads/file/18793/onshore_wind_energy_supplementary_guidance_november_2016 (Accessed 12/4/2019)

[120] DECC (2011) Update of UK Shadow Flicker Evidence Base [Online] Available at: https://www.gov.uk/government/publications/update-of-uk-shadow-flicker-evidence-base (Accessed 23/03/2019)

It is proposed that the industry recognised limits are applied for the purposes of the assessment:

- Worst case scenario – 30 hours per year or 30 minutes per day; and
- Realistic scenario – 8 hours per year.

Should these limits be exceeded the Applicant would consider implementing mitigation measures such as screening or installing a sensor which can "turn off" the turbine in the event of conditions being aligned for effects to be experienced.

15.4 Waste

At this stage, the exact quantities and types of waste are unknown. It is expected that they could include:

- Excavated material;
- Forestry Residues;
- Welfare facility waste;
- Packaging;
- Waste chemicals, fuels and oils;
- Waste metals;
- Waste water from dewatering;
- Waste water from cleaning activities; and
- General construction waste (paper, wood, etc.).

A Site Waste Management Plan (SWMP) will detail how waste streams are to be managed, following the Waste Hierarchy[121] of prevention, reuse, recycle, recover and as a last resort, disposal to landfill. The SWMP will be agreed and implemented prior to construction commencing on site. Therefore, it is not considered necessary for waste to be assessed further within the EIA and is scoped out for further assessment.

15.5 Telecommunications, Television Reception and Utilities

Wind farms have the potential to interfere with electro-magnetic signals and utilities passing above ground and physically with existing infrastructure below ground. This can therefore potentially affect television reception, fixed telecommunication links and other utilities.

To identify any existing infrastructure constraints, both consultation and a desk-based study will be conducted. Consultation with relevant telecommunication and utilities providers is a routine part of wind farm development and consultees will include:

- Spectrum Licensing (Ofcom);
- Television and telecommunications providers as appropriate; and
- Water, gas and electricity utilities providers.

Consultation was undertaken with relevant consultees during the 2015 Scoping exercise in 2015. Television links were identified 2.4 km west of the Site which were confirmed to be part of the Rumster Forest transmitter group. Arqiva confirmed the presence of a rebroadcast link (RBL) being fed by the transmitter at Rumster Forest. BT identified a number of fixed links present in the area within 600 m of the 2015 Scoping site boundary, especially in the northern most extent of the Site. Ofcom also identified a number of fixed links within 2 km.

Since the introduction of digital television signals, effects on television reception have substantially reduced. Given the absence of residential properties in close proximity to the Site, effects on television reception are considered extremely unlikely. Should effects upon

[121] The Waste Management Licencing (Scotland) Regulations 2011 places a duty on all persons who produce, keep or manage waste to apply the 'Waste Hierarchy' in order to minimise waste production at all stages of a development.

reception be identified as a result of the Development, mitigation is available to ensure these effects are not significant.

An updated consultation exercise will be completed in order to determine whether any new telecommunication links and utilities have been established since the original assessment and to establish whether an updated baseline is required to inform the assessment.

15.6 Aviation

Since many issues must be considered when assessing the potential effect of the Development on aviation, the local Air Navigation and Air traffic Services Providers are best placed to provide expert interpretation of what those impacts might be and how they might affect safety, efficiency and flexibility of their operations. There is a well-established regulatory and policy framework that has been in force for a number of years, but which has been the subject of constant amendment and updating.

Where there is line of sight between turbines and air traffic controls radars, it is possible that the turbines may be detected by the radar dependant on atmospheric conditions, and appears as clutter on the controllers' screens; such clutter can have a direct operational impact on air traffic control operations.

No potential effects were highlighted during the 2015 Scoping exercise; however, updated potential effects on other aviation interests will be evaluated by considering the consultation response from NATS and MOD in the context of the likelihood of identified aviation operators using the airspace in the vicinity of the Development.

The Site lies in an area where, although there is little by way of notable military and civil aviation infrastructure in the form of airports and airfields in the immediate vicinity, there may be some air routes (or airways) and military low flying training airspace which will be confirmed during consultation.

The general approach to wind farm development is to avoid adverse effects on aviation infrastructure where possible, and to find appropriate technical mitigation solutions where this cannot be achieved. Policy guidance and extant regulations in respect of the potential interference effects of wind turbines on air traffic control radars are highlighted in civil and military publications. Furthermore, there are airfield physical safeguarding and telecommunication and navigational infrastructure safeguarding requirements.

Consultation with relevant aviation providers is a routine part of wind development relation to the Development the following consultees have been identified:

- Ministry of Defence (Defence Infrastructure Organisation);
- National Air Traffic Services (NATS);
- Civil Aviation Authority (CAA); and
- Highlands and Islands Airports (HIA)

A search for private airfields will be conducted in parallel with the consultation process, and any identified airfields will also be consulted on the proposed turbine development.

15.7 Scoped In Effects

A shadow flicker assessment will be undertaken using Resoft Windfarm to determine whether or not there will be any impacts on surrounding properties. This will examine all properties which lie within 11 rotor diameters and 130 degrees either side of north from each turbine.

15.8 Scoped Out Effects

15.8.1 Health and Safety, including Major Accidents and Disasters

Properly designed and maintained wind turbines are a safe technology. The site design and inbuilt buffers from sensitive receptors will minimise the risk to humans from the operation of the turbines. Risks associated with ice build-up and lightning strike are removed or reduced through inbuilt turbine mechanisms in modern machines, and as such can be scoped out at this stage. Health and Safety during construction and decommissioning phases of the Development will be subject to relevant legislation and best practice as included in the CMP. Therefore, there is no further requirement for Health and Safety to be assessed within the EIA and is scoped out of further assessment.

The Development is not located within an area prone to such disasters and the likelihood of such an event is extremely rare. Therefore, it is concluded that no significant effects will arise due to major accidents and natural disasters as a result of the Development, and this topic can be scoped out of the EIA.

15.8.2 Waste

A SWMP will be implemented prior to construction commencing on site and detail how waste streams are to be managed; therefore, it not considered necessary for waste to be assessed further in the EIA and is scoped out of further assessment.

15.8.3 Television Reception and Utilities

The Development will be designed to ensure that are no effects on utilities with further consultation undertaken prior to construction to ensure there are no effects. As such, utilities are scoped out of further assessment

Since the introduction of digital television signals, effects on television reception have substantially reduced. Given the absence of residential properties in close proximity to the Site, effects on television reception are considered extremely unlikely, and are scoped out of the EIA.

15.8.4 Aviation and Telecommunications

Whilst it is anticipated that due to the location of the Development, it is unlikely to cause a significant impact to aviation and telecommunications interests. The scope of any aviation and telecommunications impact assessment, if required, will be based on the outcome of consultation discussions with the relevant consultees. In the event that consultees return a 'not significant' response in regards to telecommunications and aviation, as would be expected given the limited extent of the Development, it is proposed to scope out telecommunications and aviation from assessment in the EIA Report.

15.9 Key Questions for Consultees

The above scope is based on the requirement for EIA to consider the likely significant effects. Effects that are not likely significant do not require assessing under the EIA Regulations.

Key questions for consultees are:

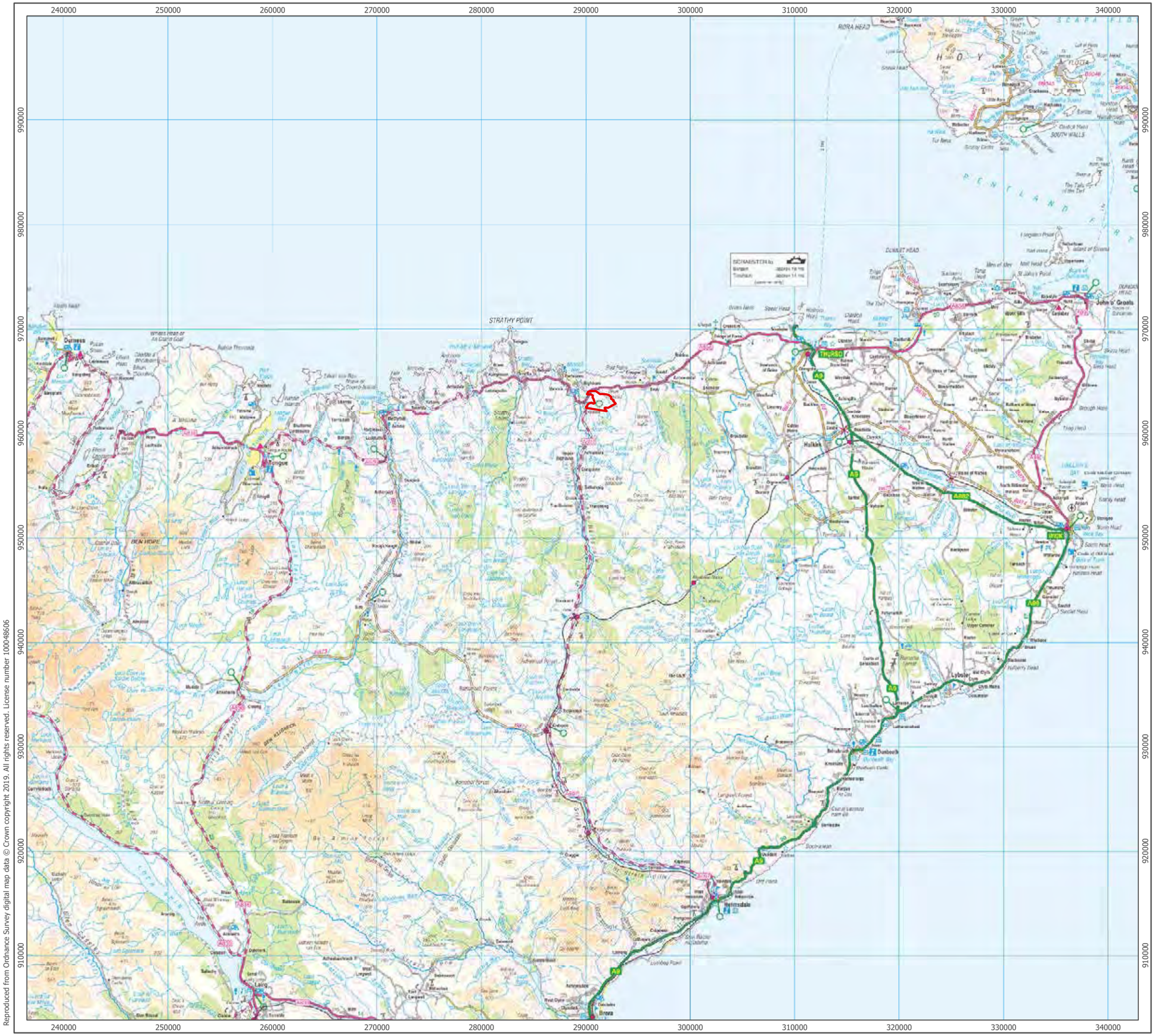
- Do consultees agree with the suggested approach regarding Human Health and to scope out further assessment?
- Should no properties fall within eleven rotor diameters and 130 degrees of north of the Development, are consultees content that shadow flicker can be scoped out of the EIA?

- Do consultees agree with the suggested approach regarding Waste and to scope out further assessment?
- Are any consultees aware of any additional telecommunications, utilities or aviation stakeholders that should be taken into account?
- Are consultees content that effects upon television reception and utilities can be scoped out of the EIA?
- Following detailed consultation with telecoms providers, should no telecommunications links be found in the immediate vicinity of the Development, are consultees content that telecommunications can be scoped out? and
- In the event that all aviation consultees confirm no infrastructure would be affected by the development, can aviation be scoped out of the EIA?

APPENDIX A: FIGURE LIST

This Appendix contains the following figures:

- Figure 1.1: Site Location;
- Figure 1.2: Indicative Site Layout;
- Figure 5.1: Zone of Theoretical Visibility (40km) and Proposed Viewpoints;
- Figure 5.2: Zone of Theoretical Visibility (20km) and Proposed Viewpoints;
- Figure 5.3: Landscape Character Types and Designated Landscapes;
- Figure 5.4: Landscape Character Types Datasets;
- Figure 6.1: Ecological and Ornithological Designations;
- Figure 7.1: 2018 Ornithology Survey Areas (INCLUDED IN CONFIDENTIAL APPENDIX D);
- Figure 8.1: Cultural Heritage Designations; and
- Figure 12.1: Interpolated Peat Depths.



arvolution

Statkraft

ARCUS

Site Boundary

1:350,000 Scale @ A3

0 7.5 15 km

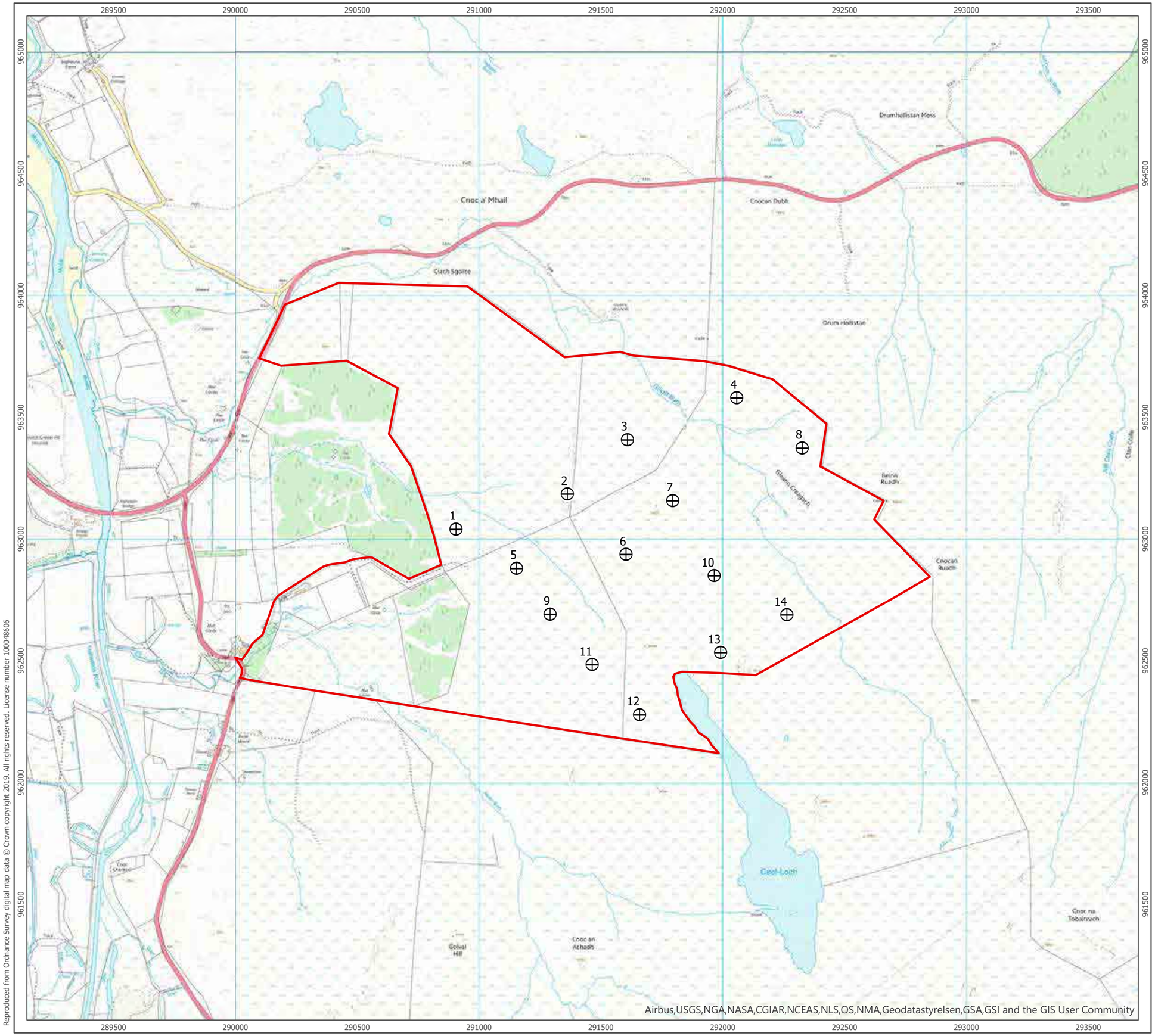
NORTH

Produced By: HW	Ref: 3138-REP-005
Checked By: HK	Date: 03/04/2019

Site Location
Figure 1.1

Ackron Wind Farm
Scoping Report

P:\Projects\Environment\3138 Ackron\3138 Ackron\3138 Ackron Scoping\3138 Ackron Scoping.aprx\3138-REP-005 Fig1.1 Site Location



arvolution

Statkraft

ARCUS

Site Boundary

⊕ Proposed Turbine Location

Turbine No.	X	Y
1	290905	963041
2	291363	963185
3	291609	963407
4	292058	963579
5	291154	962881
6	291603	962936
7	291795	963158
8	292326	963374
9	291292	962692
10	291966	962850
11	291465	962484
12	291659	962279
13	291991	962534
14	292264	962689

1:15,000 Scale @ A3

0 0.25 0.5 km

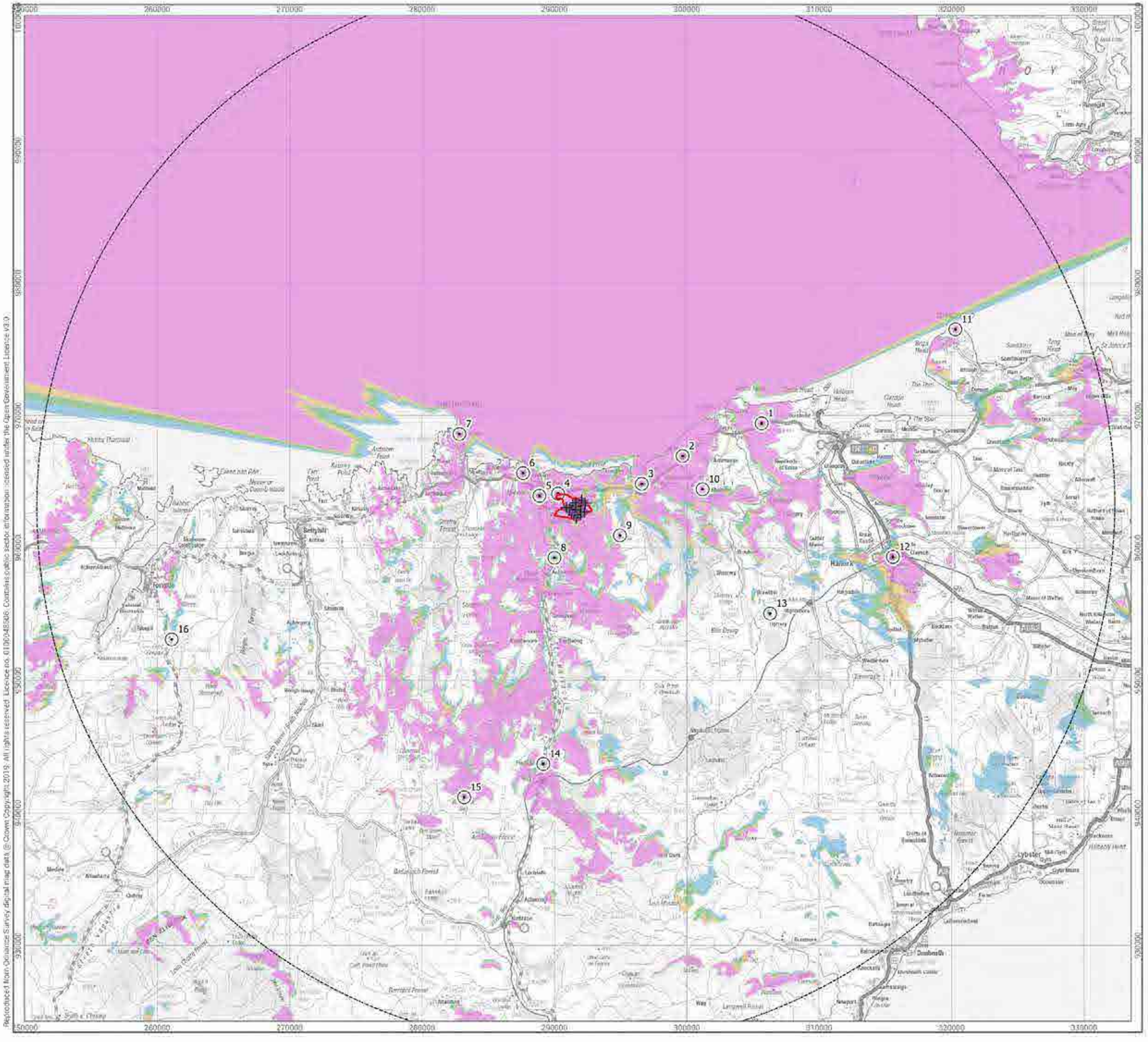
NORTH

Produced By: HW	Ref: 3138-REP-006
Checked By: HK	Date: 04/04/2019

Indicative Site Layout
Figure 1.2

Ackron Wind Farm
Scoping Report

P:\Projects\Environment\3138 Ackron\3138 Ackron\3138 Ackron Scoping\3138 Ackron Scoping.aprx\3138-REP-006 Fig1.2 Indicative Site Layout



Statkraft MVGLA arvolution ARCUS

- Turbine Locations
- Site Boundary
- 40km buffer

Zone of Theoretical Visiblity

- 1-3 turbines visbile
- 4-7 turbines visible
- 8-10 turbines visible
- 11-14 turbines visible

Proposed Viewpoints

1. A836 Forss
2. A836 Dounreay
3. A836 Reay
4. A836 Layby
5. A836 Melvich
6. Portskerra
7. Strathy Point
8. Stath Halladale, Calgarry
9. Beinn Ratha
10. Hill of Shebster
11. Dunnet Head
12. A9 Georgemas station
13. Ben Dorrery
14. A897 Forsinard
15. Ben Griam Beg
16. A836 Cnoc Craggie

Notes: The ZTV is calculated to turbine tip heights of up to 149.9m from a height of 2m above ground level. The terrain model is bare ground derived from OS Terrain 50 Height data. Earth curvature and atmospheric refraction have been taken into account

Scale @ A3: 1:275,000

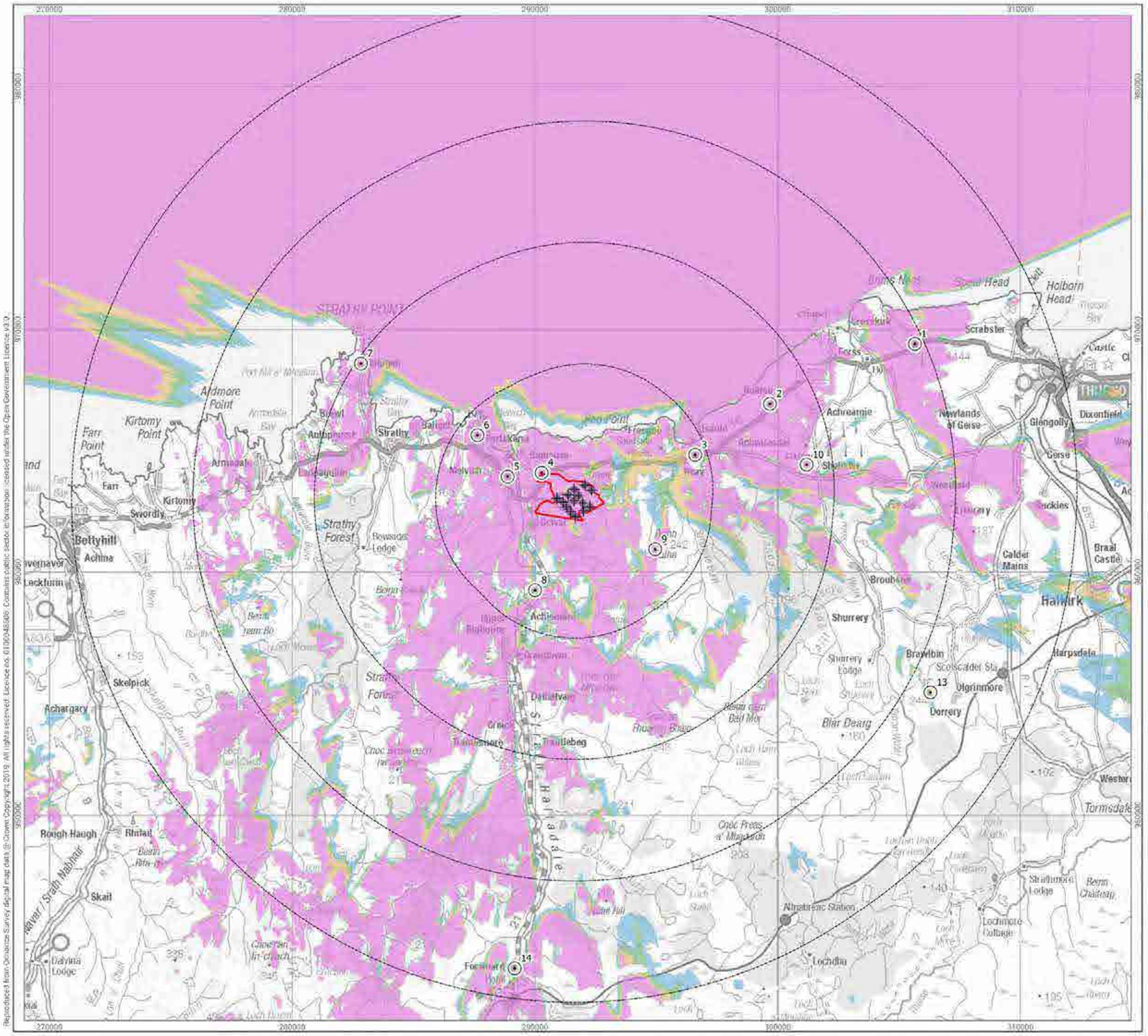
0 1 2 3 4 5 km

NORTH

Produced by: BD	Ref: 18016-04-r1
Checked by: MvG	Date: 04/04/2019

Zone of Theoretical Visibility (40km) and Proposed Viewpoints
Figure 5.1

Ackron Wind Farm
Scoping Report



Statkraft MVGLA

arvolution ARCUS

- Turbine Locations
- Site Boundary
- Buffers (5km increments)

Zone of Theoretical Visibility

- 1-3 turbines visbile
- 4-7 turbines visible
- 8-10 turbines visible
- 11-14 turbines visible

Proposed Viewpoints

1	A836 Forss
2	A836 Dounreay
3	A836 Reay
4	A836 Layby
5	A836 Melvich
6	Portskerra
7	Strathy Point
8	Stath Halladale, Calgarry
9	Beinn Ratha
10	Hill of Shebster
13	Ben Dorrery
14	A897 Forsinard

Notes: The ZTV is calculated to turbine tip heights of up to 149.9m from a height of 2m above ground level. The terrain model is bare ground derived from OS Terrain 50 Height data. Earth curvature and atmospheric refraction have been taken into account

Scale @ A3: 1:150,000

1 0 1 2 3 4 5 km

NORTH

Produced by: BD	Ref: 18016-05-r1
Checked by: MvG	Date: 04/04/2019

Zone of Theoretical Visibility (20km) and Proposed Viewpoints
Figure 5.2

Ackron Wind Farm
Scoping Report

Statkraft MVGL

arvolution ARCUS

- Turbine Locations
- Site Boundary
- Buffers (5km increments)
- National Scenic Areas
- Special Landscape Areas
- Wild Land

Landscape Character Types

- CSL1 Sweeping Moorland
- CSL2 Flat Peatland
- CSL3 Moorland Slopes and Hills
- CSL4 Lone Mountains
- CSL6 High Cliffs and Sheltered Bays
- CSL7 Long Beaches Dunes and Links
- CSL9 Strath
- CSL11 Harbour
- CSL12 Town
- CSL13 Open Intensive Farmland
- CSL14 Mixed Agriculture and Settlement
- CSL15 Small Farms and Crofts
- CSL16 Coniferous Woodland Plantation

Scale @ A3: 1:150,000

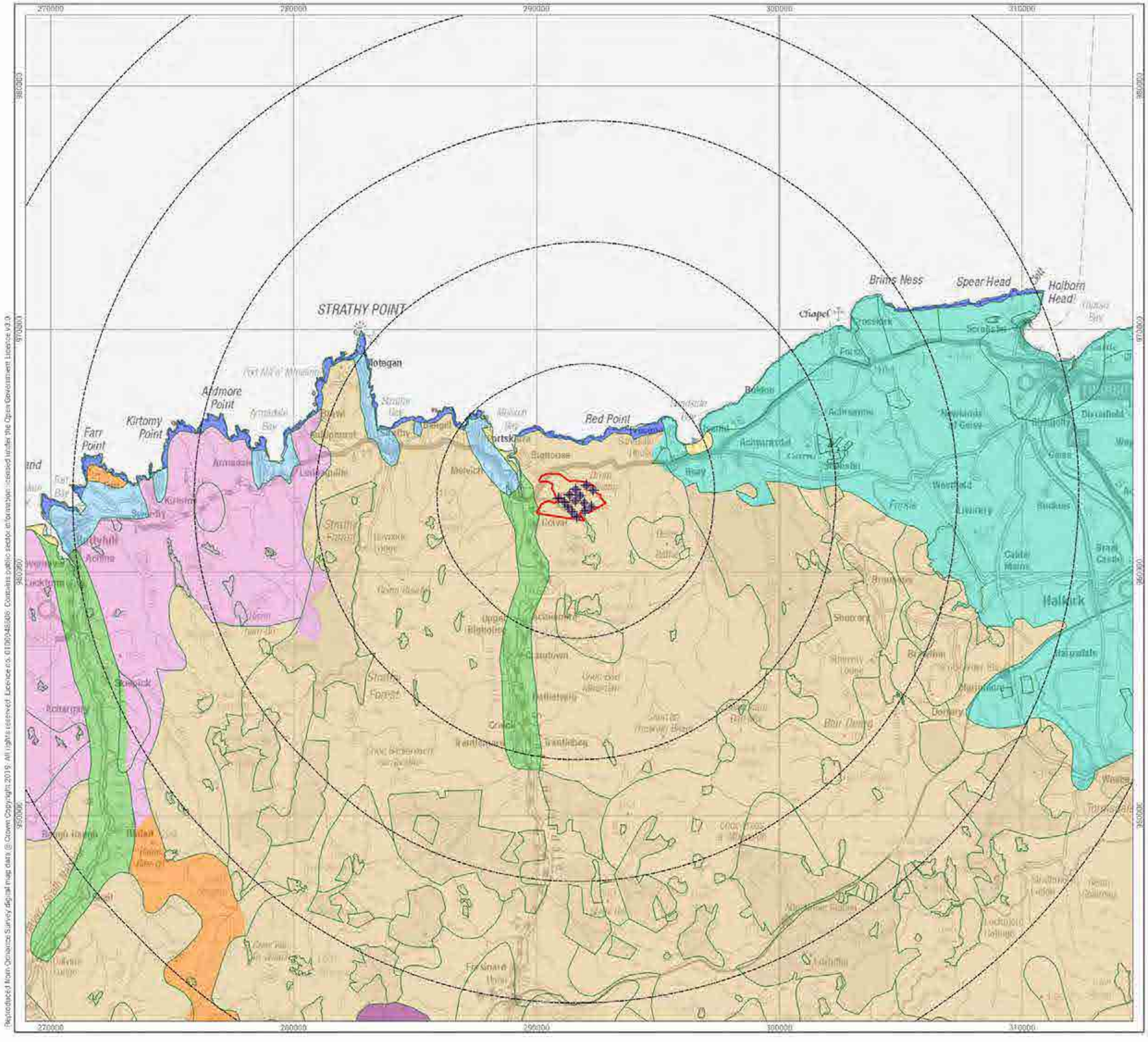
1 0 1 2 3 4 5 km

NORTH

Produced by: BD	Ref: 18016-03-r1
Checked by: MvG	Date: 04/04/2019

Landscape Character Types and Designated Landscapes
Figure 5.3

Ackron Wind Farm
Scoping Report



Statkraft MVGLA

arvolution ARCUS

- Turbine Locations
- Site Boundary
- Buffers (5km increments)

Landscape Character Types - SNH 1998

- Landscape Character Types

Landscape Character Types - SNH 2019

- Coastal Crofts & Small Farms
- Farmed Lowland Plain
- High Cliffs and Sheltered Bays
- Lone Mountains
- Rocky Hills and Moorland
- Rounded Hills - Caithness & Sutherland
- Sandy Beaches and Dunes
- Strath - Caithness & Sutherland
- Sweeping Moorland and Flows

Notes: SNH released updated landscape character assessment data in March 2019. The landscape is characterised at a broader scale than the original 1998 landscape character types.

Scale @ A3: 1:150,000

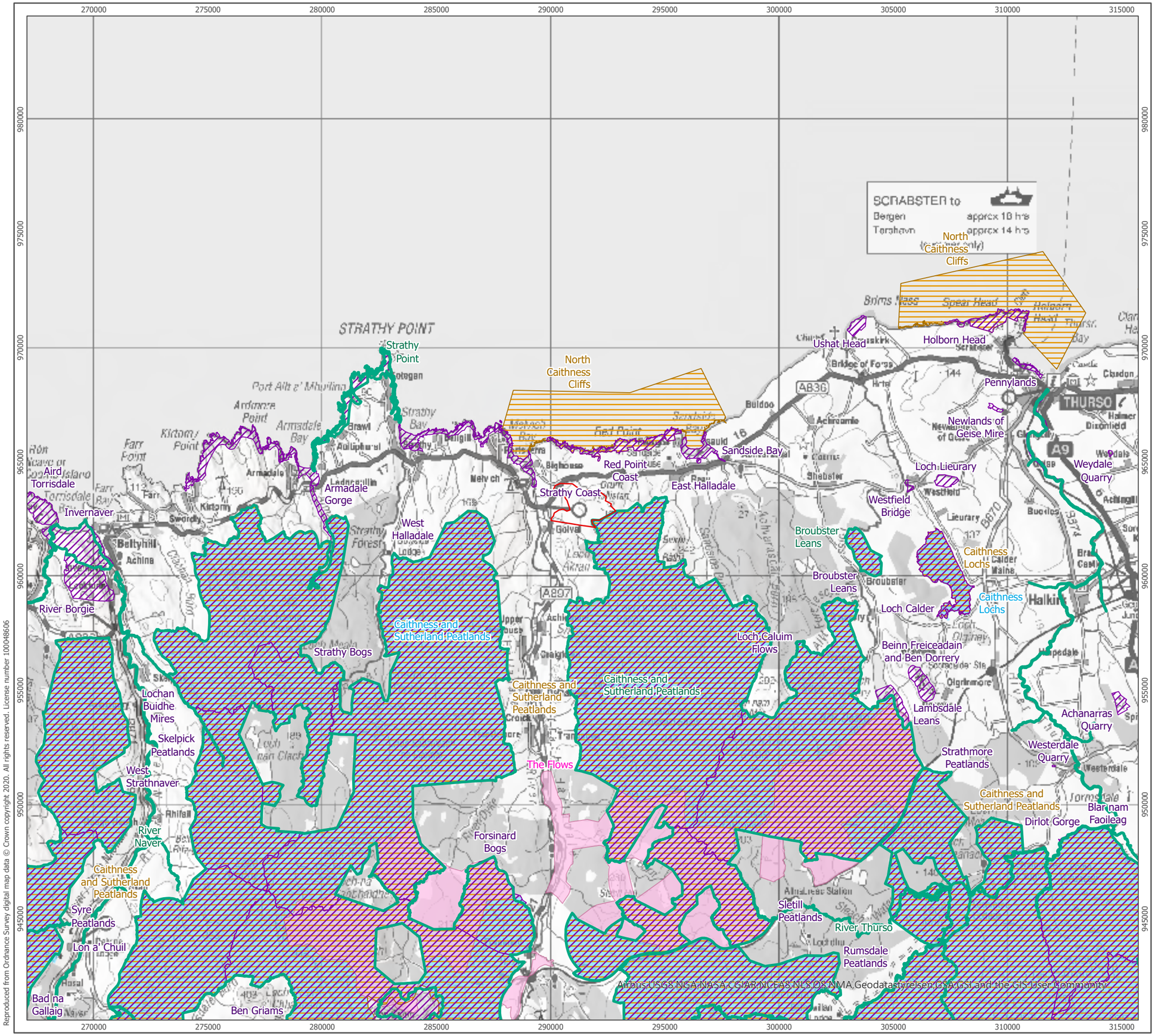
1 0 1 2 3 4 5 km

NORTH

Produced by: BD	Ref: 18016-06-r1
Checked by: MvG	Date:04/04/2019

Landscape Character Type Datasets
Figure 5.4

Ackron Wind Farm
Scoping Report



Site Boundary
5 km buffer
10 km Study Area
20 km Study Area
Special Area of Conservation
Special Protection Area

1:160,000 Scale @ A3

0 4 8 km

NORTH

Produced By: HW	Ref: 3138-REP-007
Checked By: HK	Date: 21/10/2019

Ecological and Ornithological Designations
Figure 6.1

Ackron Wind Farm Scoping Report

P:\Projects\Environment\3138 Ackron\3138 Ackron\3138 Ackron Scoping\3138 Ackron Scoping.aprx\3138-REP-007 Fig6.1 Ecological and Ornithological Designations