



Statkraft

Carn Fearna Wind Farm

Environmental Impact Assessment Scoping Report

[June 2023]



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1. Introduction

1.1 Overview

Carn Fearna Wind Farm Limited intends to apply to the Energy Consents Unit (ECU) for consent to develop a wind farm at land approximately 1.5km north east of the village of Garve in Ross-shire (the 'Proposed Development').

It is anticipated that the Proposed Development would comprise up to 14 wind turbines with associated infrastructure including external transformers, crane hardstandings, access tracks, cabling, borrow pits and a single substation including control building and battery storage. It is proposed that the blade tip height would be up to 200m.

It is the intention of Carn Fearna Wind Farm Limited to submit an application for consent under section 36 of the Electricity Act 1989 (the 1989 Act). The Proposed Development will constitute a Schedule 2 development as provided for by the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) (the EIA Regulations 2017).

SLR Consulting Limited (SLR) has been appointed to undertake an Environmental Impact Assessment (EIA) Scoping study and prepare this EIA Scoping Report to accompany a request to the ECU, to provide an EIA Scoping Opinion.

A pre-application meeting was held with the ECU on 14/03/2023.

The findings of the Environmental Impact Assessment process will be used to inform the final design of the Proposed Development and assess its predicted environmental effects. The results of the EIA will be presented in an EIA Report that will be submitted with the application for consent to the ECU.

1.2 Purpose of the Scoping Report

Undertaking an EIA Scoping Study is regarded as good practice¹ and is considered to be an important step in EIA as it allows all parties involved in the process to agree on key environmental issues relevant to the Proposed Development and to agree on the methodology used for their assessment. The scoping stage seeks to engage the determining authority and other stakeholders at an early stage in the planning process; and ensures that key opinions, based on local understanding, are identified.

The specific aims of this Scoping Report are to:

- identify the technical subject areas that may be subject to significant environmental effects as a result of the Proposed Development proceeding and which therefore require further study;
- identify the technical subject areas that are unlikely to be subject to significant environmental effects and can be scoped out from further study;
- provide a basis for a consultation process to agree the scope and content of the EIA with the ECU;
- provide a basis for agreeing methodologies for undertaking required studies with the ECU, based upon currently available baseline data, site characteristics and best practice in individual technical disciplines; and
- provide all statutory consultees and stakeholders as listed in Appendix 1.1 with an opportunity to comment on the Proposed Development at an early stage.

In making its formal Scoping Opinion, under Regulation 17(4)(a) of the EIA Regulations, the ECU must consult with a number of consultees and incorporate their views within the Scoping Opinion.

Upon receipt of the Scoping Opinion, Carn Fearna Wind Farm Limited will continue the EIA process that will lead to the preparation of an EIA Report, paying due cognisance to the findings and responses received. In the 2017 version of the Environmental Impact Assessment (EIA) Directive (2014/52/EU),

¹ SNH (2013) A Handbook on Environmental Impact Assessment 4th Edition

scoping remains voluntary, however, if a Scoping Opinion is requested, there is a requirement to base the EIA on the Scoping Opinion received.

1.3 Notice of Intention

The applicant, Carn Fearna Wind Farm Limited, hereby gives the ECU notice in writing that it intends to make an application for consent (as detailed above), and to accompany such an application with an EIA Report. This notice, made pursuant to Regulation 17 of the EIA Regulations, includes information necessary to identify the location, the nature and purpose of the Proposed Development, and indicates the main environmental consequences to which the prospective applicant proposes to refer to in its EIA.

1.4 The Applicant

The applicant will be Carn Fearna Wind Farm Limited (CFWFL), a wholly owned subsidiary of Statkraft UK Limited.

Statkraft is a leading company in renewable energy internationally and is Europe's largest generator of renewable energy. The Group produces hydropower, wind power, solar power, gas-fired power and supplies district heating. Statkraft is a global company in energy market operations and has 5,300 employees in 21 countries.

Statkraft is at the heart of the UK's energy transition. Since 2006, Statkraft has gone from strength to strength in the UK, building experience across wind, solar, hydro, storage, grid stability, EV charging, green hydrogen and a thriving markets business.

Statkraft has invested over £1.3 billion in the UK's renewable energy infrastructure and facilitated over 4GW of new-build renewable energy generation through Power Purchase Agreements (PPA). In the UK Statkraft employs over 450 staff in England, Scotland, and Wales, and plays a key role in helping the global business reach its goal of 9GW of developed wind and solar power by 2025.

Further information on Statkraft can be found on its corporate web site at <https://www.statkraft.co.uk/>.

1.5 SLR Consulting Limited

SLR is a Registered Environmental Impact Assessor and Member of the Institute of Environmental Management and Assessment (IEMA) and holder of the EIA Quality Mark (<http://www.iema.net/qmark>). SLR is also a Registered Organisation validated by the Institute for Archaeologists (IfA), a member of the Association of Geotechnical and Geo-environmental Specialists, and a Landscape Institute (LI) Registered Practice.

The company has significant experience and expertise in the preparation of planning applications and section 36 Electricity Act applications and undertaking EIA for a wide variety of projects. SLR's environmental specialists, have the skills and relevant competency, expertise and qualifications to undertake EIA for the Proposed Development.

Further information on SLR can be found on its corporate website at www.slrconsulting.com.

1.6 Project Team

SLR and OPEN have been commissioned by the applicant to undertake the EIA for the Proposed Development, with input from specialist consultants David Bell Planning, Avian Ecology, Bow Acoustics, DGA Forestry and Optimised Environments (OPEN).

1.7 Report Structure

Following this introductory section, the remainder of this Scoping Report comprises the following sections:

- Section 2.0: Site and Surroundings:
 - describes the location, setting and physical characteristics of the site and describes baseline features in and around the site;
- Section 3.0: Proposed Development:
 - provides an outline of the Proposed Development;
- Section 4.0: Scoping the EIA:
 - provides detail on the approach to scoping the EIA, sets out the process of Scoping consultation and describes the specialist studies that will be undertaken to assess the impact of the Proposed Development on the environment, and a reasoning why certain aspects have been scoped out of the EIA;
- Section 5.0: Statutory and Policy Framework:
 - identifies the development plan and provides a list of policy and guidance to be considered;
- Section 6.0 - 14.0: Specialist environmental studies that are proposed to be undertaken:
 - describes the specialist environmental studies that are proposed to be undertaken to assess the potential significant effects of the Proposed Development on the environment and where relevant notes those aspects to be scoped out of assessment;
- Section 15.0: Aviation:
 - covers the methodology used to undertake the aviation and radar scoping assessment, lists the references used and describes the baseline conditions, consultation requirements and mitigations to be applied if required; and
- Section 16.0: Other Environmental Issues
 - describes the environmental topics which are considered not likely to experience significant effects and are therefore proposed to be scoped out of the EIA.

2. Site and Surroundings

2.1 Site Location and Topography

The site, centred on NGR NH 42295 62742 is located approximately 1.5km north east of the village of Garve, Ross-shire within The Highland Council administrative boundary (Figure 1.1 Site Location). The site is located on open moorland with a small area of forestry, approximately 1.6km east of the A835 (nearest turbine location). Loch Garve and Loch Luichart lie to the south west at 1.5km and 3.3km, respectively.

Land cover across the site is predominantly bog, acid grassland, heather, heather grassland, thin peaty soils and freshwater lochans. Land cover surrounding the site is predominantly coniferous woodland to the west, south and east, with small pockets of remnant broadleaved woodland to the west and south west. Montane habitat to the north east of the site denotes the Ben Wyvis massif range rising from the lower moors. Glaciated rocky outcrops (metamorphic) and knolls are evident at higher elevations, and have been subject to glacial smoothing where exposed.

The site is located within the Landscape Character Assessment Area No.331 - Rounded Rocky Hills Landscape Character Type, Ross and Cromarty (c.20ha). The site is characterised by moderate elevation rounded hills, steep sided slopes and rocky moorland intersected by low curving glens, lochs and straths. Maximum elevation of this LCT is approximately 300-600m above sea level.

The landscape is generally uninhabited in the application site and surrounds, with the exception of settled glens and straths including Gorstan (2.4km), Garve (1.55km) and Tarvie (3.5km) to the west and south west; and Strathpeffer (7.7km) and Jamestown (7.5km) to the east and south east.

Soils and subsoils comprise peaty gleys and mudrocks which are considered to be shallow (can be dug to depths of 0.5m or less) and deep (can be dug to depths of more than 1m) to a lesser extent across the site. Underlying geology consists of Glenfinnan psammite, pelite and semipelites and a thin band of metamorphic Caledonian gneiss in the north west.

Topography within the site is typically 300m-430m, with great variation locally. The lower slopes in proximity to the conifer band in the west are c.300m and extend to c.420m in the north; c.400m in the east and c.390m across the south extent.

The site boundary encompasses three lochans – Loch an Tuirc (west); Loch na Gearra (east); and Loch a Bhealaich (Figure 1.2 Site Boundary). Loch an Tuirc drains to the Allt an Torra-Bheithe, essentially discharging into Loch Garve (Allt an Dubh/Black Water). The route of the Black Water confluences with Allt a Mhuillinn approximately 1.9km to the west, before reaching Loch Garve. Both watercourses have 'Good' status potential. The Rogie Burn drains the slopes of Ben Wyvis range approximately 1.4km to the east, which also confluences with Black Water. The River Conon and Black Water meet approximately 7.8km north of Marybank.

The underlying aquifer is part of the Glenfinnan Group waterbody and is described as having low productivity with only small yields of groundwater. The north west extent of the site is underlain by the Morar Group aquifer, also with associated low yields. A mine plan extent is evident across the north of the site, intersecting from west to east and indicates the extent of quarrying associated with the Mica Localities, Highland (ID:18822).

2.2 Surrounding Area

There are no core paths within the application site, the closest path network located through the ancient woodland to the west of the site, and to the south extending eastwards along the extent of Ailean Dubh (Black Water), towards Strathpeffer and Contin. Large linear extents of Ancient Woodland Inventory (long-established, of plantation origin) bound the site to the west; to the south; and south east (semi-natural origin) at the base levels of surrounding slopes.

The closest Wild Land Area No 29 Riddoroch – Beinn Dearg- Ben Wyvis extends just within the north eastern extent of the site boundary.

There are no designated sites within the site, the closest statutory designated sites within 5km are listed below as shown on Figure 2.1, Designations are:

- Carm Gorm Site SSSI – 0.2km east (geological interest, Moine Supergroup, igneous pegmatite);
- Ben Wyvis SSSI, SAC, SPA – 1.6km north east;
- Loch Ussie SSSI – 7.4km south east;
- Lower River Conon SSSI, SAC – 6.4km south east;
- Cromarty Firth SSSI, Ramsar – 11.6km south east;
- Achanalt Marshes SSSI – 12.8km south;
- Fannich Hills SSSI, SAC – 13.5km west;
- Beinn Dearg SSSI, SAC, SPA – 12.8km north west;
- Conon Islands SAC – 6.3km south east;
- Moray Firth and Inner Moray Firth SPAs – 1.7km south east;
- Glen Affric to Strath Conon SPA – 3.8km south west;
- Novar SPA – 14.5km east; and
- Morangie Forest SPA – 24km north east.

Aside from the surrounding conifer plantation and elevated rocky moorland, there are small occurrences of agricultural land use south of Gorstan, a railway station and small primary school at Garve and dispersed lodges and B&B accommodation. The primary road network connecting Inverness and the South with Ullapool and wider Sutherland runs from south east to the north west (A835). The Wester

Ross route from Garve (A832) continues for approximately 72km bypassing Loch Luichart, Anchasheen and Loch Maree before reaching the north west coast near Gairloch.

Closest residential receptors are located to the NW approximately 70m from the site boundary, although the distance to the nearest turbine would be approximately 1,350m.

2.3 Cumulative Context

The wider cumulative context of surrounding wind farms is shown on Figure 2.2. The notable sites are as follows:

- Abhainn Dubh Wind Farm (13 No. turbines, 149.9m blade tip) is in the planning system and is located approximately 7.5km to the east;
- Kirkan Wind Farm (17 No. turbines, 175m blade tip) is being appealed through the DPEA and is located approximately 5km to the north west;
- Corriemoillie Wind Farm (17 No. turbines, 125m blade tip) is constructed and is located approximately 6.5km to the north west;
- Lochluichart Wind Farm (17 No. turbines, 125m blade tip) is constructed and is located approximately 7.5km to the north west;
- Lochluichart Wind Farm Extension (6 No. turbines, 125m blade tip) is constructed and is located approximately 8km to the north west;
- Lochluichart Extension II (5 No. turbines, 149.9m blade tip) is approved and is located approximately 8.5km to the north west;
- Fairburn Wind Farm (20 No. turbines, 100m blade tip) is constructed and is located approximately 8.4km to the south;
- Fairburn Wind Farm Extension (14 No. turbines, 200m blade tip) is at scoping and is located approximately 8.4km to the south; and
- Novar /Novar Extension wind farms (50 No. turbines in total) is constructed and is located approximately 14km to the north east.

3. Proposed Development

3.1 Proposed Development

It is currently anticipated that the Proposed Development would consist of up to 14 wind turbines with a tip height of up to 200m (Figure 3.1, Site Layout). The associated infrastructure would include the following components:

- permanent foundations supporting each turbine;
- widening/improvement works to existing tracks onsite;
- new onsite access tracks providing access from the public highway and to all turbine locations and to include turning heads and passing areas;
- potential watercourse crossings / culverts;
- crane hardstandings and associated laydown areas adjacent to each turbine;
- power cables linking the turbines laid in trenches underground;
- one permanent and one temporary anemometry mast;
- search areas for two borrow pits;
- a possible offsite turning area adjacent to the A835;
- site signage;
- biodiversity enhancement areas;
- a substation compound including a control building and battery storage; and
- a temporary site construction compound.

Table 3-1 shows the current turbine specifications being considered, as well as the turbine coordinates for the layout shown in Figure 3.1 (please note these coordinates are based on the current layout which will be refined throughout the preparation of the EIA).

Table 3-1: Turbine Coordinates and Specifications

Turbine ID	Easting	Northing	Hub Height (m)	Rotor Diameter (m)	Tip Height (m)
1	242144	863835	122.5	155	200
2	241779	863362	122.5	155	200
3	242586	863457	122.5	155	200
4	241347	862710	122.5	155	200
5	242086	862907	122.5	155	200
6	243145	863125	122.5	155	200
7	241503	862309	122.5	155	200
8	242024	862437	122.5	155	200
9	243173	862646	122.5	155	200
10	241330	861812	122.5	155	200
11	242730	862101	122.5	155	200
12	243825	862338	122.5	155	200
13	243207	861683	122.5	155	200
14	243983	861850	122.5	155	200

The Proposed Development would be expected to contribute over 50MW to the Scottish Government's renewable energy targets and would be decided under section 36 of 'The Electricity Act 1989'. The output would be confirmed once the turbine procurement exercise has been completed, but is expected to be in the region of 113MW based on the current candidate turbine and battery storage facility.

3.1.1 Wind Turbines

A candidate turbine manufacturer and 'worst case' model will be selected for each technical and environmental discipline for the purposes of the EIA. Currently the candidate turbine is the SG155, however a competitive procurement process would be undertaken, should consent be forthcoming and prior to construction, to select the final turbine that would be installed onsite. The final wind turbine selected would have a tip height of up to 200m. The specification of the wind turbine would be a typical horizontal axis design, comprising of three rotor blades, a hub and a nacelle. The tower would be tubular and tapered in design and finished in a light grey semi-matt colour. An indicative layout of 14 turbines is shown on Figure 3.1. Each wind turbine would be served by its own electrical transformer,

3.1.2 Grid Connection

The point of connection to the grid network has been confirmed as being at SSEN Corriemoillie substation located approximately 5.5km west of the site, due to its close proximity.

An application was submitted in April 2022 to SSEN/National Grid ESO for the potential grid connection with an aspired connection date of 2029. The precise route of cabling has not yet been determined and assessment of the route is outwith the remit of this Scoping Report as it would be applied for with a Section 37 application.

The Proposed Development would be connected to the electricity network via an onsite substation and control building. This is likely to be located on the approach to the turbine area in the far north west corridor of the site; and would be a single storey building with a pitched roof housing switchgear and metering, protection and control equipment.

3.1.3 Access

The wind turbines would be delivered to the site using the existing public road network, delivered from Invergordon via the Cromarty Firth. The preferred approach to the site for abnormal loads would be via the A9 and A835 (shown on Figure 3.1).

A route survey review with swept path analysis was concluded in June 2021. An access Route Review has also been undertaken to identify a suitable track route from the A835 to the western site boundary.

3.1.4 Battery Storage

Energy storage such as the use of batteries is being considered for inclusion as part of the Proposed Development. Battery storage would comprise a number of units with ancillary equipment such as inverters. The batteries could store excess power generated by the Proposed Development and release the power to the grid when the output from the Proposed Development falls due to decreased wind speed.

3.2 Construction Works

The duration of the construction works would be approximately 12-24 months.

3.3 Wind Farm Lifecycle and Decommissioning

It is anticipated that the Proposed Development would have an operational life of up to 40 years. At the end of the operational life, the Proposed Development would be decommissioned or an application may be submitted to extend the life of the wind farm or to repower the site. The decommissioning period would take up to a year.

The ultimate decommissioning approach would be agreed with THC and other appropriate regulatory authorities in line with best practice guidance and requirements of the time. This would be done through the preparation and agreement of a Decommissioning and Restoration Plan (DRP). Financial provision for the decommissioning would be provided for. Over the period of operation of the wind farm it is recognised that there are likely to be changes in legislation and guidance, environmental designations, the status/condition of sensitive environmental receptors and stakeholder objectives that may affect decommissioning and restoration methodologies. The detailed DRP would reflect the scientific ideas and best practice current at the time of decommissioning and restoration.

With this in mind, an assessment of the decommissioning of the Proposed Development will not be undertaken as part of the EIA, as at this stage the future baseline conditions cannot be predicted accurately and both the proposals for refurbishment/decommissioning and the future regulatory context are unknown. Decommissioning is, therefore, scoped out for all environmental topics and is not discussed further, but is likely to be addressed by a condition on the consent requiring a decommissioning plan to be submitted for approval towards the end of life of the Proposed Development.

4. Scoping the EIA

The EIA Directive (2014/52/EU) was transposed into the current EIA Regulations on 16th May 2017. The EIA will be undertaken in accordance with the EIA Regulations, Circular 01/2017 (Scottish Government, 2017), the best practice guidelines of the Institute of Environmental Management and Assessment (Guidelines for Environmental Impact Assessment) published in 2004 and the Scottish Natural Heritage (SNH) (now NatureScot) handbook on EIA 2013.

The principal purpose of the EIA will be to assess in a systematic manner the potential significant environmental effects of the Proposed Development. Throughout the process of undertaking the EIA, the results obtained will be used in an iterative manner to influence the design of the Proposed

Development, in order that any significant, detrimental environmental effects can be designed out (embedded mitigation), minimised or negated completely through the careful design and approach to mitigation.

4.1 Approach to Scoping

This Scoping Study has mainly been based upon a desk based appraisal consideration of datasets from a variety of sources including Ordnance Survey mapping, Development Plans, information on the Proposed Development supplied by Carn Fearna Wind Farm Limited and application documents (including environmental assessments) submitted for nearby wind farm schemes including Kirkan, Loch Luichart and Extensions, Corriemoillie and Abhainn Dubh Wind Farms (within 10km), in addition to the previous Carn Gorm 2013 application .

The desk-based appraisal has been complemented by the application of Geographic Information System (GIS) technology to collate and identify potential environmental receptors and environmental designations that may be affected by the Proposed Development. The GIS datasets comprise details of ecologically important sites, sites of archaeological and/or cultural heritage importance, landscape designations and other important receptors (watercourses etc.). The potential receptors and designated sites that have been identified are shown on Figure 2.1.

The findings of the desk-based work and GIS work have been augmented by some site reconnaissance and survey work, as well as by discussion with consultees (including pre-application advice). Site work to date has included Phase 1 habitat and National Vegetation Classification (NVC) Survey, initial peat depths surveyed for the Carn Gorm Peat Stability Assessment, a landscape design visit to identify key receptors, and approximately two years of ornithological surveys. Seasonal terrestrial ecology surveys are underway. A further Phase 1 peat survey visit will be undertaken by SLR in early June 2023 to validate existing peat depth data and consolidate substrate identification. Ecological surveys for UKHab, National Vegetation Classification (NVC), bats, protected mammals and fish habitat will be completed in summer 2023 by Avian Ecology.

4.2 Potential Environmental Effects

The EIA Regulations (Regulation 4 (2), (3) and (4)) specify that the EIA must:

“(2) 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 (a) 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

(4) The effects to be identified, described and assessed under paragraph (2) include the expected effects deriving from the vulnerability of the development to risks, so far as relevant to the development, of major accidents and disasters.”

Previous experience of other wind farm development sites, combined with the EIA requirements, pre-scoping consultation, the knowledge of the site and possible effects of the Proposed Development, has led to the identification of the following topics for consideration in the EIA. A summary of known baseline conditions of relevance, predicted effects, any outline mitigation measures that can be recommended at this stage and the proposed scope for the EIA is provided for each of the following topic areas in Sections 6.0 to 16.0:

- Landscape and Visual;
- Ecology;
- Ornithology;
- Geology, Hydrogeology, Hydrology and Soils;
- Archaeology and Cultural Heritage;
- Noise and Vibration;
- Site Access, Traffic and Transport;
- Forestry;
- Socio-economics, Tourism, Recreation and Land Use;
- Aviation; and
- Other Environmental Issues.

For each topic that is identified as requiring further study, a detailed technical assessment will be carried out in accordance with the scope and methodology agreed with relevant consultees. Each technical assessment will be carried out by an appropriately qualified consultant to prevailing technical and professional standards and reported in a dedicated EIA Report Chapter.

The technical assessments will provide a detailed assessment of potential impacts, identification of mitigation measures and description of the significance of residual effects (those remaining after the mitigation measures have been implemented). The EIA will identify direct and indirect effects, positive (beneficial) and negative (adverse) effects, and seek to identify, as far as possible, the duration of such effects, whether short term, long term, permanent, temporary, periodic, etc. during the construction and operational phases of the Proposed Development. The results of each technical assessment will be reported in the EIA Report and will be accompanied by technical appendices and illustrative material where reasonable. A Non-Technical Summary (NTS) will be produced.

4.3 Type of Effects

The 2017 EIA Regulations (Schedule 4, Paragraph 5) require consideration of a variety of types of effect, namely direct/indirect, secondary, cumulative, transboundary, positive/negative, short/medium/long-term and permanent/temporary. In the EIA Report, effects are considered in terms of how they arise, their nature (i.e. whether they are positive or negative) and their duration.

The assessment of effects upon environmental receptors will cover the period over the construction and operation of the Proposed Development. These are considered as follows:

- Construction – environmental effects may result from construction activities; these effects are likely to be temporary in duration.
- Operation – environmental effects may result from the Proposed Development during the operational phase; these effects are likely to be long term or permanent.

4.4 Assessment of Effects

The methodology for predicting the nature and magnitude of any potential environmental effects varies according to the technical subject area. This section provides an overview of the general approach that will be adopted.

4.4.1 Baseline

This section will describe:

- the key receptors that have been identified;
- a brief description of those receptors;
- the sensitivity attributed to each receptor; and
- where further details can be found within the relevant technical appendices.

4.4.2 Sensitivity of Receptors

The sensitivity of receptors will be defined according to the relative sensitivity of existing environmental features on or in the vicinity of the Site, or by the sensitivity of receptors which would potentially be affected by the Proposed Development, including their capacity to accommodate the kinds of changes the Proposed Development may bring about.

Criteria for the determination of sensitivity or importance will be established based on prescribed guidance, legislation, statutory designation and/or professional judgement.

4.4.3 Magnitude of Impact

The magnitude of impact (degree of change) relative to environmental baseline conditions will be identified through detailed consideration of the Proposed Development, taking account of the following factors:

- the degree to which the environment is affected, e.g. whether the quality is enhanced or impaired;
- the scale or degree of change from the baseline situation;
- whether the effect is temporary or permanent, indirect or direct, short term, medium term or long term; and
- In some cases the likelihood of effect occurrence may also be relevant, and where this is a determining feature of the assessment this will be clearly stated.

4.4.4 Significance of Effect

The significance of an effect is derived from an analysis of:

- the sensitivity of receptors to change; and
- the amount and type of change, or magnitude of impact which includes the timing, scale, size, likelihood and duration of the change.

Where relative significance is reported, the assessment will identify the threshold for significant effects.

4.4.5 Cumulative Effects

For each technical discipline, an assessment will be made of the likely cumulative effects of the Proposed Development in combination with any other similar developments in proximity to the Site which are reasonably defined and understood; these would comprise projects that:

- are the subject of valid applications² or appeals but not yet determined;
- consented; or
- are under construction.

Projects that are already constructed and operational are considered to form part of the baseline conditions. Cumulative effects can also arise from the combined impact of effects attributable to the Proposed Development in respect of a particular receptor, such as the combined effect of noise and visual amenity on a residential dwelling.

4.4.6 Assessment of Effects and Mitigation

An assessment of potential environmental effects will be undertaken to identify any predicted significant effects. Where significant adverse environmental effects are predicted in the EIA process, the EIA Report will provide additional measures (bespoke mitigation) to eliminate or reduce the effects to acceptable levels.

² Projects that have been notified under the section 36 or planning regulations but have not been submitted will not be considered.

Mitigation is considered an integral part of the overall design strategy for the Proposed Development. Design principles and environmental measures that form an integral part of the project design will be taken into account in the assessment of environmental effects.

A Schedule of Mitigation will be included within the EIA Report. The Schedule will summarise the mitigation and enhancement measures proposed in the technical chapters of the EIA Report to reduce or offset the effects of the Proposed Development on the environment.

4.4.7 Residual Effects

Any remaining effects of the Proposed Development, following implementation of any bespoke mitigation measures, are referred to as 'residual effects'. The EIA will assess each residual effect and identify a significance level. Residual effects may be adverse or beneficial, short, medium or long-term, direct or indirect, permanent or temporary, and reversible or irreversible.

4.4.8 Decommissioning Effects

Environmental impacts arising from decommissioning works are likely to be of a similar nature, but smaller scale and geographical extent, to construction impacts. For example, it is highly unlikely that piled foundations, if required, would be removed during decommissioning.

In addition, it is not known when decommissioning would take place and therefore the baseline environment at the time of decommissioning cannot be ascertained with any certainty. Furthermore, the proposals for decommissioning and site restoration as well as the future regulatory context are unknown. For these reasons, it is proposed that the assessment of effects resulting from decommissioning activities is scoped out of the EIA. Decommissioning is likely to be addressed by a condition on the consent requiring a decommissioning plan to be submitted for approval towards the end of life of the Proposed Development.

4.5 Consultation

Consultation is an important part of the EIA process and will be reported within the EIA Report and supporting documentation, including a Pre-Application Consultation (PAC) Report.

The Applicant is committed to promoting dialogue with statutory and non-statutory consultees and local communities, seeking to engage with all those with an interest in the Proposed Development to provide transparency during the EIA process.

The Applicant has identified a community consultation area in collaboration with local representatives. This is not a static area and will change in response to feedback throughout the development process.

Methods of engagement will be accessible in English, and include:

- household and businesses mailing list to those within 10km radius as a minimum;
- adverts in local newspapers (print and online);
- public exhibitions in a variety of locations (this will include a hybrid element);
- webinars;
- face-to-face meetings with stakeholders, local communities and neighbours; and
- dedicated project website.

4.5.1 Scoping Consultation

This Scoping Report is issued to the ECU, who will then consult with key consultees and stakeholders before forming its Scoping Opinion. It is anticipated that the agencies and bodies to be consulted will include those listed in Appendix 1.1; this list is not exhaustive and other agencies will be consulted during the EIA as and when required.

The purpose of the consultation is to identify:

- key local issues and concerns;
- issues of environmental importance that may be affected by the Proposed Development and need to be considered in an EIA;
- existing information that will be of assistance in the assessment of the environmental effects; and
- the need for further consultation.

4.5.2 **Public Consultation**

A public exhibition event is planned for late September 2023 with a further public exhibition event proposed for late February 2024 (both in person and online as well). The autumn exhibition will be an opportunity for the public to learn about the Proposed Development through information panels and visualisations. Discussion and feedback on the Proposed Development will be encouraged; and where received, will be taken into account in the development of the design and of the EIA. The February 2024 exhibition will provide the public with an update on progress and show the nearly finalised wind farm design, provide an update on the EIA, and further information on community benefits and submission timescales.

Initial informal discussion with the community councils and development trusts in the vicinity of the project will be undertaken.

5. Statutory and Policy Framework

5.1 Introduction

This Section describes the statutory framework within which the application will be submitted and outlines relevant policy and guidance documents that will be taken into consideration to help inform the design of the Proposed Development.

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

5.2 The Statutory Framework

The Proposed Development will have an installed capacity of over 50 Megawatts (MW). In Scotland, onshore renewable energy developments that have capacity to generate over 50MW require consent from the Scottish Ministers under the Electricity Act 1989 (the 'Electricity Act'). In such cases the Planning Authority is a statutory consultee in the development management process and procedures. In an application under Section 36 of the Electricity Act the Development Plan does not have primacy in the decision-making process.

The provisions of Schedule 9 of the Electricity Act are relevant to the assessment of the Proposed Development. The provisions of Schedule 9 of the Electricity Act set out a number of features to which regard must be had by the Scottish Ministers and such features have been addressed in the Environmental Impact Assessment (EIA) process.

The Scottish Ministers will determine the application having regard to the statutory duties in Schedule 9 of the Electricity Act, so far as relevant, and any other relevant material considerations, one of which will be relevant aspects of the statutory Development Plan.

5.3 Renewable Energy Policy: Overview

In recent years United Kingdom ('UK') and Scottish Government policies have focussed increasingly on concerns about climate change. Each tier of Government has developed targets, policies and actions to achieve targets to deal with the climate crisis and generate more renewable energy and electricity.

The UK Government retains responsibility for the overall direction of energy policy, although some elements are devolved to the Scottish Government. The UK Government has published a series of policy documents setting out how targets can be achieved. Onshore wind generation, located in Scotland, is identified as an important technology to achieve these various goals.

The Scottish Government has published a number of policy documents and has set its own targets. The most relevant policy, legislative documents and more recent policy statements published by the Scottish Government include:

- The Scottish Energy Strategy (December 2017);
- The Scottish Government's declaration of a Climate Emergency (April 2019);
- The Scottish Climate Change Plan Update (2020);
- The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 and the legally binding net zero target for 2045 and interim targets for 2030 and 2040;
- The Scottish Government's 'Programme for Government' (2022);
- The Onshore Wind Policy Statement (December 2022); and
- The Draft Energy Strategy and Just Transition Plan (January 2023).

The Proposed Development relates to the generation of electricity from renewable energy sources and comes as a direct response to national planning and energy policy objectives.

The Proposed Development would make a contribution to the attainment of emissions reduction, renewable energy and electricity targets at both the Scottish and UK levels. Detailed reference to the renewable energy policy framework will be provided in the Planning Statement.

5.4 National Planning Policy and Guidance

National Planning Framework 4

NPF4 forms part of the statutory development plan. Section 13 of the Planning (Scotland) Act 2019 amends Section 24 of the 1997 Act regarding the meaning of 'development plan'. Such that for the purposes of the 1997 Act, the development plan for an area is taken as consisting of the provisions of:

- The National Planning Framework; and
- Any Local Development Plan (LDP).

NPF4 introduces centralised development management policies which are to be applied Scotland wide, and also provides guidance to Planning Authorities with regard to the content and preparation of LDPs.

NPF4 continues the approach set out in NPF3 of identifying national developments. Proposed National Development 3 (ND3) is entitled 'Strategic Renewable Electricity Generation and Transmission Infrastructure'. The Proposed Development would therefore have national development status as per these provisions of NPF4.

The most relevant policies include the following:

- Policy 1: Tackling the Climate and Nature Crisis;
- Policy 3: Biodiversity;
- Policy 4: Natural Places;
- Policy 5: Soils;
- Policy 6: Forestry, Woodland and Trees;
- Policy 7: Historic Assets and Places; and
- Policy 11: Energy.

For the consideration of onshore wind energy development, Policy 11 is the lead policy.

NPF4 will be the key policy consideration for the determination of the Proposed Development as part of the statutory Development plan.

National Planning Guidance

National planning guidance and advice are material considerations, which are relevant to the Proposed Development and will be considered in the EIA Report. These include, but are not limited to, the following documents:

- Planning Advice Note (PAN) 1/2011 Planning and Noise (Scottish Government, March 2011);
- PAN 2/2011 Planning and Archaeology (Scottish Government, July 2011);
- PAN 1/2013 Environmental Impact Assessment (Scottish Government, August 2013);
- PAN 51 Planning, Environmental Protection and Regulation (Scottish Government, October 2006);
- PAN 60 Planning for Natural Heritage (Scottish Government, January 2008);
- PAN 69 Planning and Building Standards Advice on Flooding (Scottish Government, August 2004);
- PAN 75 Planning for Transport (Scottish Government, August 2005); and
- PAN 79 Water and Drainage (Scottish Government, September 2006).

5.5 The Local Development Plan

Local Development Plans

The application site is located within the administrative area of The Highland Council (THC). The Local Development Plan (LDP) for the site comprises:

- Highland-Wide Local Development Plan (HwLDP, 2012) and associated Supplementary Guidance; and
- The Inner Moray Firth LDP (2015).

The Inner Moray Firth LDP does not contain any development management policies of relevance to the Proposed Development.

The following policies of the HwLDP are considered relevant to the Proposed Development:

- Policy 28 – Sustainable Design;
- Policy 30 – Physical Constraints;
- Policy 31 – Developer Contributions;
- Policy 51 – Trees and Development;
- Policy 52 – Principle of Development in Woodland;
- Policy 53 – Minerals;
- Policy 55 – Peat and Soils;
- Policy 57 – Natural, Built and Cultural Heritage;
- Policy 58 – Protected Species;
- Policy 59 – Other Important Species;
- Policy 60 – Other Important Habitats;
- Policy 61 – Landscape;
- Policy 62 – Geodiversity;
- Policy 63 – Water Environment;
- Policy 64 – Flood Risk;
- Policy 66 – Surface Water Drainage;
- Policy 67 – Renewable Energy; and
- Policy 77 – Public Access.

Supplementary Guidance (SG)

Supplementary Guidance forms part of the LDP. The relevant Supplementary Guidance pertaining to the Proposed Development is the Onshore Wind Energy Supplementary Guidance adopted in 2016 (OWESG).

The Onshore Wind Energy: SG (OWESG), adopted by THC in November 2016, sets out how the Council will manage onshore wind energy development proposals. The OWSEG sets out a spatial framework for onshore wind energy development, however such a policy approach is not incompatible with NPF4. The OWESG does contain guidance separate from the spatial framework which remains relevant, and which will be referred to both in the EIA Report and in the Planning Statement.

A landscape sensitivity appraisal was introduced as an addendum to the OWESG in December 2017. The addendum contains 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 contain associated strategic capacity conclusions.

5.6 Conclusions

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

The EIA Report will summarise the renewable energy policy framework, but the detail and policy appraisal will be provided in a supporting Planning Statement to accompany the Section 36 application.

6. Landscape and Visual

6.1 Introduction

This section of the report has been prepared by landscape architects at Optimised Environments Limited ('OPEN'), directed by James Welch FLI BA Hons, Chartered Landscape Architect and Director at OPEN. OPEN is a registered practice with the Landscape Institute.

6.2 Environmental Baseline and Potential Sources of Impact

6.2.1 Scope of Study and Study Area

The landscape and visual impact assessment (LVIA) will be prepared and undertaken by landscape architects who have extensive experience of renewable energy projects in the Highlands. This section outlines the range of likely effects of the Proposed Development (during construction and operation) on the landscape and visual resource and the proposed methodology for the identification, assessment, and reporting of effects.

The following figures are associated with this section:

- Figure 6.1: Landscape Character Types
- Figure 6.2: Landscape Designations
- Figure 6.3: Wild Land Areas
- Figure 6.4: Blade Tip ZTV Of Scoping Layout with Designations, Wild Land and Viewpoints

In accordance with guidance (SNH (2017) Visual Representation of Wind Farm, Version 2.2), for turbines of 200m to blade tip, the study area will cover a radius of 45km from the nearest turbine. A focussed study area of 20km radius will also be considered.

The preliminary cumulative assessment study area will be 60km, with the detailed cumulative assessment likely to focus on a study area with a maximum 45km radius, in accordance with guidance.

Baseline information for the Proposed Development site is described below. Establishing a baseline helps to gain an understanding of what makes the landscape distinctive and what its important components or characteristics are and is instrumental in the identification of the landscape character receptors, visual receptors and viewpoints that are relevant to the Proposed Development.

6.2.2 Landscape Character

Landscape character for the 45km study area is classified according to NatureScot's 2019 dataset and is shown on Figure 6.1.

The Proposed Development site lies entirely within the Rounded Rocky Hills - Ross & Cromarty Landscape Character Type (LCT). There are three closely related areas of this LCT, separated by various strath and glen LCTs, of which the host unit for the Proposed Development lies to the north-east, with the other two, larger, areas lying to the west and south-west. This LCT forms a transition between the rounded hills and mountains to the north and the rugged mountain massif LCTs to the south and west.

The relevant characteristics of this LCT are described as follows in the NatureScot description:

- *“Moderate scale, well-defined hills with rounded and domed profiles, relatively steep sides and rocky moorland surface texture.*
- *Hills separated by low, curving glens, lochs and straths.*
- *High proportion of exposed, glaciated rock at upper levels, with perched lochans, bogs and burns.*
- *Mosaic of vegetation and variety of textures at lower levels consisting of heather, rough grassland, pockets of broad leaved woodland and regenerating trees, and coniferous forests.*
- *Rocky landform and low, moorland land cover contrasts with surrounding sheltered wooded glens and smoother moorlands.*
- *Low intensity land use and limited access contrasts with adjacent farmed plains and straths.*
- *Extensive views of adjoining plains, firths and mountains from higher levels.*
- *Occasional masts and pylons tend to be visually absorbed by rocky landforms and vegetation. Overall this landscape lacks manmade features, most of which occur in the north and are absorbed by the complex texture and landform. One moderate-sized wind farm is a prominent feature, and occasional masts and pylons are visible on skylines.*
- *Wild character in the south-west area, which is more remote and has few built structures.”*

Fairburn Wind Farm lies within this LCT, approximately 8.5km to the south of the Proposed Development.

To the north, east and north-west, the site is surrounded by the large-scale Rounded Mountain Massif and Rounded Hills and Moorland Slopes - Ross & Cromarty LCTs. To the west and south-west is another area of Rounded Rocky Hills - Ross & Cromarty LCT, separated from the site area by a narrow band of Strath - Ross & Cromarty LCT, within which Garve and the A832/A835 are located. To the south is an area of the heavily forested Wooded Glens and Rocky Moorland LCT.

The LVIA will include an assessment of the effects of the Proposed Development on the relevant LCTs within the study area.

6.2.3 Landscape Designations

The Proposed Development site itself is not covered by any known international or national landscape-related planning designations. The north-eastern corner of the site is, however, covered by the regional level designation of the Ben Wyvis Special Landscape Area (SLA), and various designated areas are also found elsewhere in the study area, as shown on Figure 6.2 and described below. Designations are also shown in relation to the Zone of Theoretical Visibility (ZTV) diagram on Figure 6.4.

National Scenic Areas

National Scenic Areas (NSAs) are considered to be important on a national level. The Town and Country Planning (National Scenic Areas) (Scotland) Designation Directions 2010 defines a National Scenic Area as an area *"of outstanding scenic value in a national context."*

Policy 4 Paragraph of NPF4 states that:

“c) Development proposals that will affect a National Park, National Scenic Area, Site of Special Scientific Interest or a National Nature Reserve will only be supported where:

i. The objectives of designation and the overall integrity of the areas will not be compromised; or

ii. Any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social, environmental or economic benefits of national importance.”

There are four NSAs within or partially within the 45km Study Area:

- Dornoch Firth NSA;
- Glen Affric NSA;
- Glen Strathfarrar NSA; and
- Wester Ross NSA.

Of these, the closest is the Glen Strathfarrar NSA, which is a minimum of over 20km to the south of the site. The other NSAs are all over 30km away. The ZTV shows that there is no visibility of the scoping layout from the Dornoch Firth, Glen Strathfarrar or Wester Ross NSAs, and very limited theoretical visibility from the Glen Affric NSA, over 30km away.

It is likely that this lack of, or very limited, and distant visibility of the Proposed Development from NSAs will result in effects on the NSAs being scoped out of the assessment. This will, however, be monitored throughout the iterative design process and the need for an assessment of effects on NSAs will be reviewed in relation to the final layout of the Proposed Development. If an assessment of effects on NSAs is required, this will be carried out in accordance with NatureScot's guidance; Working Draft 11 'Guidance for Assessing the Effects on Special Landscape Qualities' (SNH, November 2018), which uses the Special Qualities of NSAs as a basis for the assessment.

Gardens and Designed Landscapes

Gardens and Designed Landscapes (GDLs) are considered in Policy 7, NPF4, which is concerned with 'Historic assets and places'. Policy 7 states that:

"i) Development proposals affecting nationally important Gardens and Designed Landscapes will be supported where they protect, preserve or enhance their cultural significance, character and integrity and where proposals will not significantly impact on important views to, from and within the site, or its setting."

There are a number of GDLs in the study area, of which a small group to the south-east of the site are the closest to the Proposed Development. These include Castle Leod GDL, the closest to the site, at a minimum of around 4.7km; The Spa Gardens, Strathpeffer GDL, approximately 5.7km away; Fairburn GDL, approximately 8km away; and Brahan, 9km away.

As GDLs are considered as historic assets rather than landscape designations, effects on GDLs and their settings are considered in Section 10: Cultural Heritage.

Special Landscape Areas

Special Landscape Areas (SLAs) are areas of land considered to be important at a local level, as designated by THC. Detailed citations for each of the 27 SLAs that lie within THC administrative area are provided in 'Assessment of Highland Special Landscape Areas' (THC in partnership with SNH, 2011). These citations describe each SLA in terms of its "key landscape and visual characteristics, the special qualities for which it is valued, its key sensitivities to landscape change, and possible measures for its enhancement."

There are six SLAs within, or partially within, the 45km study area:

- Ben Wyvis SLA;
- Cromarty Sutors, Rosemarkie and Fort George SLA;
- Drynachan, Lochindorb and Dava Moors SLA;
- Fannichs, Beinn Dearg and Glen Calvie SLA;
- Loch Ness and Duntelchaig SLA; and
- Strathconon, Monar and Mullardoch SLA.

The closest SLA to the Proposed Development is Ben Wyvis SLA, which covers the north-eastern corner of the site. The next closest SLA is the Fannichs, Beinn Dearg and Glen Calvie SLA, a minimum of 13km to the north-west, while Strathconon, Monar and Mullardoch SLA is a minimum of 13.5km to the

south-west. Both of these SLAs are shown on the ZTV to have very intermittent theoretical visibility of the Proposed Development and are unlikely to undergo significant effects.

The effects on the Ben Wyvis SLA will be considered in the LVIA, and effects on the Beinn Dearg and Glen Calvie SLA and Strathconon, Monar and Mullardoch SLA may be a consideration dependent on the level of visibility and influence of the final layout of the Proposed Development.

The remaining three SLAs lie more than 25km away and are shown on the ZTV to gain negligible or very intermittent theoretical visibility. The distance of these SLAs from the site and the very limited visibility/ influence of the Proposed Development ensures that there will not be a significant effect on the overall integrity of the designated areas.

6.2.4 Wild Land Areas

Wild Land Areas (WLAs) are shown on NatureScot's 2014 wild land mapping and referred to in Policy 4 of NPF4, as below.

“g) Development proposals in areas identified as wild land in the Nature Scot Wild Land Areas map will only be supported where the proposal:

i. will support meeting renewable energy targets; or,

ii. is for small scale development directly linked to a rural business or croft, or is required to support a fragile community in a rural area.

All such proposals must be accompanied by a wild land impact assessment which sets out how design, siting, or other mitigation measures have been and will be used to minimise significant impacts on the qualities of the wild land, as well as any management and monitoring arrangements where appropriate. Buffer zones around wild land will not be applied, and effects of development outwith wild land areas will not be a significant consideration.”

There are six WLAs within or partially within the 45km study area, as shown on Figure 6.3 and 6.4 (in conjunction with the ZTV):

- Central Highlands (Area 24);
- Coulin & Ledgowan Forest (Area 26);
- Fisherfield - Letterewe – Fannichs (Area 28);
- Flowerdale - Shieldaig – Torridon (area 27);
- Reay – Cassley (Area 34); and
- Rhidorroch – Beinn Dearg – Ben Wyvis (Area 29).

The eastern part of the site lies within the southern extremity of the Rhidorroch – Beinn Dearg – Ben Wyvis WLA, and an assessment of effects on the wild land qualities of this WLA will be included in the LVIA. The scope of this wild land assessment will be agreed with NatureScot and THC.

6.2.5 Visual Receptors

Settlements

The pattern of settlement development in the study area is widely varied, with towns and villages concentrated in the more populated eastern areas while there are very few settlements in the remote uplands that surround the other aspects of the site, with the exception of Garve located close to the western site boundary. The settlements that are considered are those that are identified as settlements in adopted local development plan mapping. The closer settlements to the Proposed Development are located around the Beaully and Cromarty Firths, including Contin, Strathpeffer, Marybank, Jamestown, Dingwall, Muir of Ord, Conon Bridge and Evanton.

The effect that the Proposed Development will have on views from settlements will be considered in the LVIA.

Roads

The pattern of roads around the site reflects the settlement pattern, with the majority of routes passing to the east of the site. The closest A-class road is the A835, which passes to the south and west of the site at a minimum distance of approximately 1.6km away. The A832 joins the A835 at Gorstan, approximately 2.5km to the west of the site. Both of these roads form part of the North Coast 500 tourist route (NC500) and this gives them particular sensitivity. A minimum of 11km to the east of the site is the A862, which passes through Beauly and Muir of Ord and is also part of the NC500 as well as the Moray Firth tourist route. The A834 also passes a minimum of approximately 5.7km to the south-east of the site, where it passes through Strathpeffer.

The effect that the Proposed Development may have on views from these roads will be considered in the LVIA.

Railway Lines

The Inverness – Kyle of Lochalsh line passes around the east, south and west of the site at a minimum distance of 1.75km away, and the Inverness – Wick line passes 11.5km to the east. Railway lines are generally less sensitive than recognised tourist road routes but will be considered in the LVIA.

National Cycle Routes

National Cycle Route 1 (NCR1) passes approximately 11km to the east of the site. The effect that the Proposed Development may have on views from this route will be considered in the LVIA.

Walking Routes and Core Paths

The Affric-Kintail Way and Great Glen Way pass a minimum of approximately 30km and 25km to the south and south-east of the site respectively. These are unlikely to be a major issue given their distance from the site but will be considered in the LVIA. There is a network of core paths in the study area, and effects on views from core paths in the vicinity of the Proposed Development will be considered in the LVIA.

6.2.6 Zone of Theoretical Visibility

A blade tip Zone of Theoretical Visibility (ZTV) diagram is shown in Figure 6.4, which also shows the relevant designated areas, wild land areas, and representative viewpoints (which are described below). This shows the theoretical visibility of the scoping layout of the Proposed Development across the 45km study area. Theoretical visibility as shown on the ZTV takes into account screening of the turbines by landform but not any screening by surface features such as woodland or buildings.

6.2.7 Viewpoints

The LVIA will be informed by a series of viewpoints which are selected to cover points of specific importance, including recognised viewpoints, settlements, hilltops, important routes, designated landscapes and so on. A variety of landscape character types and points from different directions and distances will also be represented in the selected views.

The locations shown in Table 6.1 below have been identified as possible viewpoints for the assessment. The final viewpoint locations will depend on the final layout for the Proposed Development, and these locations are intended to be illustrative only. The viewpoint locations are shown in conjunction with the blade tip ZTV for the scoping layout on Figure 6.4.

Table 6-1: Draft Viewpoint List

Viewpoint Number and Name	Grid Reference	Comment
1. Garve War Memorial	239444-861476	The elevated location of this viewpoint at the War Memorial allows a more open view than is gained from much of the settlement of Garve.
2. A835, north of Garve	239012-862242	Viewpoint located in a north-bound lay-by on the A835(T), on the NC500. Close to the junction with the A832 and to the north of the settlement of Garve.

Viewpoint Number and Name	Grid Reference	Comment
3. A832 Torriegorrie	236856-863216	Viewpoint located on the A832 (NC500) approximately 1.3km to the west of the junction with the A835(T), north of Garve. This stretch of the road is orientated towards the Proposed Development and represents the views of road-users on the A832
4. A832, Lochluichart, near Lochluichart Station	232955-863102	Viewpoint located on the A832 (NC500) in the hamlet of Lochluichart.
5. A835, near Tarvie/Rogie Falls	244193-858651	Viewpoint located on the A835 (NC500) near the attraction of Rogie Falls. Visibility from the falls is screened by forestry/woodland.
6. A835, Contin	245849-855859	Viewpoint located on the A835 (NC500) in the village of Contin.
7. A834, Jamestown	247727-856742	Viewpoint located on the A834 near the settlement of Jamestown.
8. A832, Marybank	247938-853752	Viewpoint located on the A832 in the village of Marybank.
9. Knockfarrel	250427-858486	Viewpoint included to represent the outlook gained by visitors to Knockfarrel, with a panoramic view and located on a core path.
10. Little Wyvis	242931-864377	Viewpoint located at the high point of Little Wyvis, within the Ben Wyvis SLA and on the edge of WLA 29 Rhiddoroch - Beinn Dearg - Ben Wyvis.
11. An Cabar	245040-866574	Viewpoint located at the intermediate summit of Ben Wyvis, which will be gained by the majority of people walking up Ben Wyvis as it is on a well-used path route. Within the Ben Wyvis SLA and WLA 29 Rhiddoroch - Beinn Dearg - Ben Wyvis.
12. Glas Leathad Mor	246298-868364	Viewpoint located at the highest summit of Ben Wyvis. Within the Ben Wyvis SLA and WLA 29 Rhiddoroch - Beinn Dearg - Ben Wyvis.
13. A835/B9169 Crossroads	256014-853748	Viewpoint located at the crossroads between the A835(T) and the B9169 at the southern end of the Black Isle.
14. A9, Black Isle, near Duncanston	259001-857063	Viewpoint located at the crossroads between the A835(T) and the B9169 at the southern end of the Black Isle.
15. A835, Loch Glascarnoch	231271-872295	Viewpoint on the A834 as it passes Loch Glascarnoch.

Viewpoint Number and Name	Grid Reference	Comment
16. Cnoc Fyrish monument	260754-869776	View from popular walking destination at the Fyrish Monument. On core path RC05.01.
17. A862, west of Inverness	260472-846197	Viewpoint on the A862 (NC500 and Moray Firth tourist route) to the west of Inverness.
18. Milton of Leys Primary School	269570-842180	Viewpoint included to provide a long, open view to the north and north-north-west, across Inverness.
19. Beinn Dearg	225952-881158	Viewpoint located at the summit of Beinn Dearg. Within the Fannichs, Beinn Dearg and Glen Calvie SLA and WLA 29 Rhiddoroch - Beinn Dearg - Ben Wyvis.
20. Beinn a' Bha'ach Àrd	236079-843499	Viewpoint at the summit of a Corbett on the northern side of Glen Strathfarrar, within WLA 24 Central Highlands.

6.2.8 Potential Sources of Impact

Potential impacts are those which could result from the construction and operation of a wind farm. Table 6.2 describes the typical landscape and visual impacts that can arise from the construction and operation of a wind farm. It should be noted that their inclusion does not imply that they will arise, or be significant, in the case of the Proposed Development.

Table 6-2: Potential Sources of Impact

Activity	Elements	Potential Impacts	Potential Sensitive Receptors
Construction	<p>Construction plant.</p> <p>Borrow pit excavation and extraction.</p> <p>Construction of tracks and crane hardstandings (including cut and fill earthworks).</p> <p>Temporary construction facilities (i.e. compounds, fencing).</p> <p>Forestry removal for keyholing/ access track buffers.</p> <p>Excavation and laying of turbine foundations.</p> <p>Turbine erection (including tall cranes).</p> <p>Construction of substation and control rooms.</p>	<p>Temporary, short-term physical effects on physical landscape fabric.</p> <p>Permanent effects on physical landscape fabric (i.e. forestry removal).</p> <p>Temporary, short-term effects on landscape character.</p> <p>Temporary, short-term effects on views.</p>	<p>Physical landscape features e.g. forestry, ground cover.</p> <p>Landscape character receptors: landscape character types, landscape designations.</p> <p>Views experienced by different receptors e.g. residents, road users, walkers (including night-time views).</p>

Activity	Elements	Potential Impacts	Potential Receptors	Sensitive
Operation	Turbines. Battery Energy Storage System (BESS). Access tracks. Borrow pits under restoration/ restored. Substation and control rooms.	Temporary, long-term effects on landscape character. Temporary, long-term effects on views. Temporary, long-term cumulative effects with other wind farms on landscape character and views. Ongoing permanent effects on physical landscape fabric (i.e. forestry removal if required).	Physical landscape features e.g. forestry, ground cover. Landscape character receptors: landscape character types, landscape designations. Views experienced by different receptors e.g. residents, road users, walkers (including night-time views).	

6.3 Method of Assessment and Reporting

6.3.1 Introduction

The LVIA is intended to determine the likely significant effects that the Proposed Development will have on the landscape and visual resource. Five categories of potential effects on the landscape and visual resource are considered:

- physical effects on landscape elements;
- effects on landscape character;
- effects on wild land;
- effects on views (including night-time effects of visible aviation lighting on wind turbines); and
- cumulative effects.

6.3.2 Physical Effects on Landscape Elements

Physical effects are restricted to the area within the Proposed Development site boundary and are the direct effects on the existing fabric of the site, such as the removal of, alteration to, or reinstatement of ground cover. This category of effects is made up of landscape elements, which are the components of the landscape, such as moorland, which may be directly and physically affected by the Proposed Development.

6.3.3 Effects on Landscape Character

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

6.3.4 Effects on Wild Land Areas

The assessment of the effects on the 'wild land qualities' of WLAs is carried out through consideration of impacts on the physical attributes and perceptual responses of relevant WLA(s). The assessment of effects on WLAs is carried out in accordance with NatureScot guidance (Assessing Impacts on Wild Land Areas Technical Guidance, 2020) which provides a prescriptive methodology.

6.3.5 **Effects on Views**

The assessment of effects on views is an assessment of how the introduction of the Proposed Development will affect views throughout the study area. The assessment of effects on views is carried out in three parts:

- an assessment of the effects that the Proposed Development will have on a series of viewpoints;
- an assessment of the effects that the Proposed Development will have on views from principal visual receptors, which include relevant settlements and routes throughout the study area; and
- an assessment of the potential night-time effects of visible aviation lighting.

6.3.6 **Cumulative Effects**

Cumulative effects arise where the study areas for two or more wind farms overlap so that both wind farms are experienced at proximity where they may have a greater incremental effect, or where wind farms may combine to have a sequential effect, irrespective of overlap in study areas.

6.3.7 **Significance of Effects**

The objective of the assessment of the Proposed Development is to predict its likely significant effects on the landscape and visual resource. In accordance with the EIA regulations, the LVIA effects are assessed to be either significant or not significant.

The significance of effects is assessed through a combination of two considerations; the sensitivity of the landscape or visual receptor and the magnitude of change that will result from the addition of the Proposed Development. While this methodology is not reliant on the use of a matrix to arrive at the conclusion of a significant or not significant effect, a matrix is included in Table 6.3 to illustrate how combinations of sensitivity and magnitude of change ratings can give rise to significant effects. The matrix also gives an understanding of the threshold at which significant effects may arise.

Table 6-3: Illustrative Significance Matrix

		Magnitude of Change					
Sensitivity		High	Medium-High	Medium	Medium-Low	Low	Negligible
	High	Major (Significant)	Major (Significant)	Major/moderate (Significant)	Moderate (Significant/Not Significant)	Moderate/minor (Not Significant)	Minor (Not Significant)
	Medium-High	Major (Significant)	Major/moderate (Significant)	Major/Moderate (Significant)	Moderate (Significant/Not Significant)	Moderate/minor (Not Significant)	Minor (Not Significant)
	Medium	Major/moderate (Significant)	Major/Moderate (Significant)	Moderate (Significant/Not Significant)	Moderate/minor (Not Significant)	Minor (Not Significant)	Minor (Not Significant)
	Medium-Low	Moderate (Significant/Not Significant)	Moderate (Significant/Not Significant)	Moderate (Significant/Not Significant)	Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)

Magnitude of Change							
	Low	Moderate (Significant/ Not Significant)	Moderate/ minor (Not Significant)	Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)

In accordance with GLVIA3, experienced professional judgement is applied to the assessment of all effects and reasoned justification is presented in respect of the findings of each case.

A significant effect occurs where the Proposed Development will provide a defining influence on a landscape element, landscape character receptor or view. A not significant effect occurs where the effect of the Proposed Development is not material, and the baseline characteristics of the landscape element, landscape character receptor, view or visual receptor continue to provide the definitive influence. In this instance the Proposed Development may have an influence, but this influence will not be definitive.

6.3.8 Sensitivity

Sensitivity is an expression of the ability of a landscape receptor or view to accommodate the Proposed Development and is determined through a combination of the value of the receptor and its susceptibility to the Proposed Development.

Levels of sensitivity (high, medium, and low) are applied in order that the judgement used in the process of assessment is apparent. Intermediate levels (medium-high and medium-low) may also be applied where the particular combination of value and susceptibility results in an intermediate definition.

6.3.9 Magnitude of Change

Magnitude of change is an expression of the extent of the effect on landscape and visual receptors that will result from the introduction of the Proposed Development. The magnitude of change is assessed in terms of a number of variables, including the size and scale of the impact and the extent of the affected area.

Levels of magnitude of change (high, medium, low, and negligible) are applied in order that the judgement used in the process of assessment is apparent. Intermediate levels (medium-high and medium-low) may also be applied where the particular combination of variables results in an intermediate definition.

6.3.10 Cumulative Assessment

The objective of the assessment of cumulative effects is to assess the ways in which the Proposed Development will interact with other relevant existing, consented, or proposed wind farms. The cumulative assessment will be carried out in accordance with NatureScot Guidance 'Assessing the cumulative landscape and visual impact of onshore wind energy developments' (2021), and will include potential sequential cumulative effects on routes, including roads and other routes, as well as cumulative effects on static receptors and viewpoints.

The wind farms to be considered in the cumulative assessment will be agreed with THC and NatureScot with a 'cut-off date' prior to the production of the LVIA. These will include operational, under-construction, consented and application/appeal stage wind farms. Scoping-stage wind farms are not included unless there are exceptional reasons for doing so. Single turbines and those that are less than 50m to tip will not be included in the cumulative assessment.

In accordance with NatureScot guidance, the cumulative assessment will commence with a 60km radius search area. This will then be reduced as appropriate for the detailed cumulative assessment, in agreement with THC and NatureScot.

The LVIA will assess the incremental effect arising from the addition of the Proposed Development to the cumulative situation, in accordance with GLVIA3, which notes (paragraph 7.18):

"Some of those involved may tend to favour a limited view focussed on the additional effects of the project being assessed, on top of the cumulative baseline."

Some stakeholders may however be more interested in the combined effects of all the past, present and future proposals, including the proposed scheme...Assessing combined effects of different proposals at different stages in the planning process can be very complex. Furthermore, the assessor will not have assessed the other schemes and cannot therefore make a fully informed judgement. A more comprehensive overview of the cumulative effects must rest with the competent authority."

Significant cumulative landscape or visual effects arise where a 'wind farm landscape' is created as a result of the addition of the Proposed Development to other existing or proposed wind farms, resulting in wind turbines becoming sufficiently prolific that they become a prevailing or key landscape and visual characteristic across a specified area.

6.3.11 Nature of Effects

The 'nature of effects' relates to whether the effects of the Proposed Development are positive (beneficial) or negative (adverse). The landscape and visual effects of wind farms are difficult to categorise in either of these brackets as, unlike other disciplines, there are no definitive criteria by which effects can be measured as being categorically positive or negative.

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

6.3.12 Assessment of Night-Time Visual Effects

The Civil Aviation Authority (CAA) requires that 'en-route obstacles' at or above 150m above ground level are lit with visible lighting to assist their detection by aircraft. As the proposed turbines would be up to 200m tip height, there will be a requirement for some or all of these turbines to display visible red lights at night and a night-time assessment of effects will therefore be required. The lights will be placed on the nacelles (and potentially the towers) of the turbines.

The assessment of turbine lighting is intended to determine the likely effects that the Proposed Development will have on the visual resource e.g., it is an assessment of the effects of visible aviation lighting on views experienced by people at night.

The assessment of night-time effects will be informed by a ZTV of the turbine lights and night-time visualisations from three viewpoints, to be agreed with THC and NatureScot, that illustrate the proposed lighting effects. These viewpoints will represent locations from where people are most likely to experience the Proposed Development at night.

6.3.13 Residential Visual Amenity Assessment

A Residential Visual Amenity Assessment (RVAA) will be carried out in accordance with Landscape Institute Technical Guidance Note 2/19 Residential Visual Amenity Assessment (2019). In accordance with the guidance, this will include an assessment of effects on the views gained by residential properties that lie within a 2km radius of the nearest turbine in the Proposed Development. This does not form part of the LVIA and will be presented as a separate appendix.

6.4 Consultation

Consultation will be carried out with NatureScot and THC with regard to various matters including viewpoints to be included in the LVIA; cumulative wind farms to be included in the cumulative assessment; and the scope of the wild land assessment.

6.5 Matters Scoped Out

The LVIA will include an assessment of effects on the landscape and visual receptors that are described in this section. No receptors or impacts will be scoped out prior to the confirmation of the final layout of the Proposed Development.

6.6 Questions to Consultees

- Q4.1 Do consultees have any comments on the proposed approach and methodology?
- Q4.2 Are consultees in agreement with the proposed Study Area?
- Q4.3 Do consultees have any comments or suggestions in relation to the Preliminary Representative Viewpoint Locations shown in Table 6-1 and illustrated on Figure 6.4?

6.7 References and Standard Guidance

The following sources of guidance will be considered in the LVIA and the presentation of graphics:

- Guidelines for Landscape and Visual Impact Assessment: Third Edition (Landscape Institute and IEMA, 2013) (GLVIA3)
- Landscape Institute (2019). Visual Representation of Development Proposals: Landscape Institute Technical Guidance Note 06/19
- Landscape Institute (2019). Technical Guidance Note 2/19 Residential Visual Amenity Assessment
- NatureScot (2020). Assessing Impacts on Wild Land Areas Technical Guidance
- NatureScot (2021). Guidance - Assessing the cumulative landscape and visual impact of onshore wind energy developments
- SNH (2010). The special qualities of the National Scenic Areas. Scottish Natural Heritage Commissioned Report No. 374
- SNH (June 2014). Map of Wild Land Areas
- SNH (2017). Description of Wild Land Areas
- SNH (2017). Siting and Designing Wind Farms in the Landscape Version 3a
- SNH (2017). Visual Representation of Wind Farms, Version 2.2
- SNH (2018). Working draft Guidance for Assessing the Effects on Special Landscape Qualities
- THC (November 2016) Onshore Wind Energy Supplementary Guidance
- THC (July 2016). Visualisation Standards for Wind Energy Developments

7. Ecology

7.1 Introduction

This section of the report has been written by Dr Colin Bonnington DPhil, MSc, BSc (Hons.) MCIEEM who has over 10 years' experience as a professional ecologist specialising in renewable energy projects and has contributed to, and lead, the ecology aspect of many large-scale renewable developments, including wind farm projects.

7.2 Environmental Baseline and Potential Sources of Impact

7.2.1 Scope of Study and Study Area

This section has been prepared by Avian Ecology and provides a summary of baseline ecological information collected to date, and the proposed approach to assessment in accordance with best practice guidance.

Chapter 7: Ecology of the EIA Report will assess the potential effects of the Proposed Development on important ecological features and will detail proposed mitigation measures required to avoid, minimise, restore or offset adverse effects. It will also outline proposals for ecological enhancement where appropriate, to be further detailed and agreed post consent in consultation with relevant interested parties.

Important ecological features that will be considered within the EIA Report will include:

- relevant statutory designated sites, and their cited qualifying interests, such as Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs) and National Nature Reserves (NNRs);
- internationally or nationally important habitats (e.g. habitats listed on Annex I of European Commission (EC) Habitats Directive³), habitats of principal importance for biodiversity conservation in Scotland (Scottish Biodiversity List⁴); and
- populations of ecological species listed on Annex IV of the EC Habitats Directive or Schedule 5 of the Wildlife & Countryside Act 1981 (as amended), or which are scarce, or a priority for conservation under the UK BAP and/or SBL.

Study areas for baseline ecological information gathering have been based upon the site boundary and specific survey type, and have been established in accordance with best practice guidance. Study areas adopted will be updated over the course of the EIA to account for changes in scheme design and where land access permissions allow.

The study areas for the desk studies are a 2km extent from the site for notable and protected species, notable habitat types and non-statutory designated sites, extended to 10km for bat roost records. Statutory designated sites out to 10km from the site with ecological interests were regarded.

7.2.2 Baseline Conditions including Field Studies

Baseline ecological conditions to inform the design and assessment of the impacts of the Proposed Development will be established through desk study and field surveys. Full details will be presented within the EIA Report.

A brief summary of the desk studies and field surveys completed or scheduled is provided below.

Desk Study

A desk study has been undertaken in 2023 to provide further baseline information to supplement, and inform, the field studies.

The following key sources, applicable at the time, were consulted:

- Sitelink⁵;

³ Council Directive 1992/43/EEC on the conservation of natural habitats and of wild fauna and flora.

⁴ <https://www.nature.scot/scottish-biodiversity-list> [Accessed 14/04/2023]

⁵ <https://sitelink.nature.scot/home> [Accessed 13/04/2023]

- Scotland's Environment Web⁶;
- aerial imagery⁷;
- NatureScot guidance 'General pre-application and scoping advice for onshore wind farms' (NatureScot, 2022);
- NatureScot guidance on protected species with relation to developments (SNH, 2019);
- Saving Scotland's Red Squirrels⁸;
- Saving Wildcats⁹; and
- Highland Biological Recording Group (HBRG) for records of protected and notable species, and non-stutory sites and notable habitat types, within 2km (extended to 10km for bat roosts), of the Site¹⁰.

Documentation which supported the previous Carn Gorm Wind Farm application (THC Ref: 13/04791/FUL) for the site has also been reviewed and results therein provide some further baseline context.

In addition, the ecological field team has considerable experience in the survey of comparable sites in the Highlands and across Scotland and are accordingly knowledgeable of the presence or potential presence of sensitive ecological interests within the site and wider surrounding area.

Statutory Designated Sites for Nature Conservation

Statutory (international and national) designated sites located within 10km of the site are shown on Figure 7.1 and summarised in Table 7-1. Note, only those with ecological interests are considered here.

Table 7-1: Statutory Designated Sites for Table

Site Name	Approximate Distance from the site (km)	Qualifying Interests
Ben Wyvis SAC	1.58km, north-east	Habitats incl. blanket bog, dry heaths and montane acid grassland
Ben Wyvis NNR	1.58km, north-east	Those qualifying interests listed for the Ben Wyvis SAC & SSSI
Ben Wyvis SSSI	1.58km, north-east	<ul style="list-style-type: none"> • Blanket bog • Upland habitat assemblage • Dystrophic and oligotrophic lochs • Vascular plant assemblage
Conon Islands SAC	6.36km, south-east	Alder <i>Alnus glutinosa</i> woodland on floodplains
Lower River Conon SSSI	6.36km, south-east	<ul style="list-style-type: none"> • Wet woodland • Open water transition fen • Saltmarsh
Loch Ussie SAC	7.43km, south-east	Oligotrophic to mesotrophic standing waters with aquatic vegetation

⁶ <https://www.environment.gov.scot/> [Accessed 17/04/2023]

⁷ <https://www.google.com/maps/place/Garve+IV23+2PR/@57.6219759,-4.6587246,7380m/data=!3m1!1e3!4m6!3m5!1s0x488e3f458ab01825:0x2145ec9db8b89dc9!8m2!3d57.617104!4d-4.689967!16s%2Fm%2F0ch2ky> [Accessed 13/04/2023]

⁸ <https://scottishsquirrels.org.uk/> [Accessed 13/04/2023]

⁹ <https://savingwildcats.org.uk/> [Accessed 14/04/2023]

¹⁰ <https://www.hbrg.org.uk/> [Accessed 13/04/2023]

Site Name	Approximate Distance from the site (km)	Qualifying Interests
Loch Ussie SSSI	7.43km, south-east	<ul style="list-style-type: none"> • Oligo-mesotrophic loch • Upland oak <i>Quercus</i> woodland
Allt nan Caorach SSSI	9.34km, north-east	<ul style="list-style-type: none"> • Upland birch <i>Betula</i> woodland • Subalpine dry heath

Non-Statutory Designated Sites for Nature Conservation

Desk study records returned show that there are no non-statutory sites for nature conservation within 2km of the site. The nearest such site is Tollie Red Kites RSPB Reserve approximately 9.5km south-east from the site.

Wildcat Priority Area

The site is partially within the Strathpeffer wildcat priority area. Saving Wildcats⁹ will be consulted on known records, and range, of wildcat in the area including the site.

Field Studies

The scope of ecological field surveys has been determined through a review of key sources listed above. The following surveys are scheduled for completion in 2023 to establish baseline ecological conditions and potentially important ecological features within the site and surrounding area, which may be impacted by the Proposed Development:

- Phase 1 Habitat Survey;
- National Vegetation Classification (NVC) Survey;
- Ground-level Static Bat Activity Surveys;
- Bat Preliminary Roost Appraisal Survey;
- Protected Terrestrial Mammal Survey; and
- Fisheries (including freshwater pearl mussel) Habitat Survey.

Habitats and Vegetation

Surveys to establish baseline terrestrial habitat conditions at the site are to be undertaken during the plant growing season in 2023, with reference to key guidance documents, including Averis *et al.* (2004), JNCC (2010), Rodwell (1992, 1993 & 2006) and Scotland and Northern Ireland Forum for Environmental Research (2009). The purpose of these surveys is to identify vegetation communities of notable importance including habitat listed on Annex 1 of the 'Habitats Directive' and as UKBAP Priority Habitats.

Full details of baseline habitats and vegetation conditions will be presented within the EIA Report.

Where required, habitat and vegetation surveys will be updated prior to assessment in response to changes in scheme design. This will seek to ensure compliance with current NatureScot guidance (NatureScot, 2022) and provision of sufficient information in accordance with SEPA guidance (SEPA, 2017), with regards the identification of potential Groundwater Dependent Terrestrial Ecosystems (GWDTEs) to inform subsequent hydrological assessment.

Terrestrial Mammals (including bats)

Terrestrial mammal and bat surveys will be undertaken in 2023 in accordance with key guidance documents, to include Collins (2016), NatureScot *et al.* 2021) and NatureScot standing advice (NatureScot, 2023a-f). This will include checks for evidence of species including water vole, otter, badger and wildcat.

Bat activity surveys to establish the bat species assemblage and the spatial and temporal distribution of activity on the site will be undertaken in 2023, with reference to current NatureScot guidance (NatureScot *et al.*, 2021).

A preliminary ground-level appraisal will be undertaken of any suitable structures, buildings and trees within 200m plus blade length (approximately 77.5m) of proposed turbine locations for potential to

support roosting bats, in accordance with NatureScot guidance (NatureScot *et al.*, 2021). This appraisal will be carried out at the same time as the terrestrial mammal surveys, and results will be presented within the EIA Report, based on the final scheme layout.

Bat activity surveys will be completed during the spring (May), summer (June-mid-August) and autumn (mid-August-October) activity periods in 2023, using a total of 12 automated monitoring stations located within areas of the site where turbines were most likely to be located. Monitoring stations will be positioned at preliminary turbine locations, where known at the time of survey commencement, with the remainder stratified across the site based on the availability and variation of bat habitat features.

Full details of baseline survey effort and bat activity levels including data analysis¹¹, will be presented within the EIA Report.

Full details of baseline survey effort and the presence and distribution of protected terrestrial mammals within the site will be presented within the EIA Report.

Where required, terrestrial mammal walkover surveys will be updated prior to assessment in response to changes in scheme design. This will seek to ensure compliance with current NatureScot guidance (NatureScot, 2022) and the requirement for mitigation measures to avoid or reduce potentially adverse impacts upon protected terrestrial mammal species. Updated surveys will also identify any evidence of protected species which has established in the interim period, to ensure legislative compliance during the construction of the Proposed Development, including the provision of any Species Protection Plans (SPPs).

Fisheries Habitat and Freshwater Pearl Mussel Habitat Surveys

A fisheries habitat assessment of watercourses within the site will be undertaken in 2023 following industry standard guidance (SFCC, 2007), extended to include the suitability of habitats for freshwater pearl mussel *Margaritifera* in accordance with NatureScot guidance (NatureScot, 2022).

Full details of baseline survey effort and the suitability of watercourses within, and intersecting, the site to support notable fish populations and freshwater pearl mussel will be presented within the EIA Report.

Additional Field Studies

In accordance with NatureScot guidance (2022) there are some species groups which, providing the implementation of suitable mitigation measures, are unlikely to be subject to significant effects as a result of wind farm developments. As such, they do not require surveys to inform an EIA. This includes invertebrates, reptiles and amphibians.

Surveys for invertebrates, amphibians and reptiles are therefore not proposed. Given the locality, and the species restricted range in northern Scotland, the presence of great crested newt *Triturus cristatus* is considered unlikely and only common reptiles and amphibians are likely to be present. Significant effects are considered unlikely to occur with the adoption of standard construction mitigation embedded into the design of the Proposed Development.

Camera trapping surveys are not proposed at this stage, but will be considered in the event that suitable potential den and/or holt sites for wildcat and/or otter are identified during the mammal surveys, and/or are agreed through consultation with Scottish Wildcat Action (SWA).

7.2.3 Potential Sources of Impact

The EIA Report will consider the potential for significant adverse impacts upon important ecological features, which could arise during the construction, operational and decommissioning phases of the Proposed Development.

The assessment process will be informed by baseline ecological information obtained through desk study and field surveys and through consultation with relevant specialist groups, as required.

Potential impacts upon deer, with reference to current NatureScot guidance (SNH, 2016), will be considered as part of the EIA Report.

¹¹ Ecobat is currently unavailable and analysis will be undertaken in accordance with methodology and guidance available at the time of assessment.

Potential impacts upon GWDTEs, hydrology, peat and forestry will be addressed separately as discussed within Section 9 ('Geology, Hydrogeology, Hydrology and Soils') and Section 13 ('Forestry') of this report.

Construction

During construction of the Proposed Development, in the absence of mitigation, potentially significant adverse impacts upon important ecological features to be assessed within the EIA Report may arise from:

- habitat loss, fragmentation or change as a result of the delivery and installation of Proposed Development infrastructure; and
- disturbance, inadvertent killing or injuring of protected or otherwise notable species or inadvertent damage to their breeding sites or resting places.

The potential for indirect impacts upon ecological features as a result of the potential spillage and/or mitigation of pollutants and sediments during the construction phase will be considered, however potentially significant effects will be highly unlikely on the basis of embedded mitigation and good practice measures, such as those that will be detailed in an adopted Construction and Environmental Management Plan (CEMP).

There is the potential for new watercourse crossings to be required, which would pass over some of the onsite watercourses. Direct and indirect effects arising from construction works could include pollution or nutrient enrichment or hydrological disruption. Effects would be minimised through the detailed design of any watercourse crossing and the implementation of a Pollution Prevention Plan (PPP) and/or CEMP.

Operation

During operation of the Proposed Development, in the absence of mitigation, impacts upon ecological features to be addressed within the EIA Report may arise from:

- disturbance to protected or otherwise notable species as a result of operational activities such as vehicular traffic and maintenance works;
- habitat loss or change, inadvertent killing or injuring of protected or otherwise notable species resulting from the potential spillage of pollutants; and
- interaction of bats with operational turbine blades leading to mortality due to collision or barotrauma.

Decommissioning

Potential impacts associated with the decommissioning phase are likely to be similar to those identified for the construction phase and will not be discussed in detail within the EIA Report. Decommissioning is likely to be addressed by a condition on the consent requiring a decommissioning plan to be submitted for approval towards the end of life of the Proposed Development.

7.3 Method of Assessment and Reporting

Impact assessment presented within the EIA Report for ecological features will be based on current CIEEM guidance (CIEEM, 2018).

The assessment process will include the following stages:

- determination and evaluation of important ecological features;
- identification and characterisation of impacts;
- outlining mitigation measures to avoid and reduce significant impacts;
- assessment of the significance of any residual effects after such measures; and
- identification of opportunities for ecological enhancement.

The EIA Report will be supported by Technical Appendices and relevant figures, which will provide full details of desk studies, consultations and field studies undertaken to inform the design and assessment of the Proposed Development.

Ecological data considered sensitive (e.g. that pertaining to the breeding and/or resting places of protected species) will be included within a confidential appendix to the EIA Report. This will not be made publicly available but will be issued to NatureScot and THC.

Sufficient information will be presented within the EIA Report to allow an objective and robust assessment of potentially significant adverse impacts upon important ecological features to take place.

Determining Importance

The EIA Report will only assess in detail impacts upon important ecological features which are likely to be significantly affected by the Proposed Development. A detailed assessment of features that are sufficiently widespread, unthreatened and resilient to impacts of the Proposed Development will not be undertaken and justification for “scoping out” will be provided.

Relevant European, national and local legislation policy¹² and guidance will be referred to in order to determine the importance (or ‘sensitivity’) of ecological features. In addition, importance will also be determined using professional judgement, specialist consultation advice and the results of baseline surveys and the importance of features within the context of the geographical area.

Importance will not necessarily relate solely to the level of legal protection that a feature receives, and ecological features may be important for a variety of reasons, such as their connectivity to a designated site and the rarity of species or the geographical location of species relative to their known range.

The importance of ecological features will be defined in a geographical context from ‘Local’ to ‘International’.

Identification and Characterisation of Impacts

The identification and characterisation of impacts on important ecological features will be undertaken in accordance with the CIEEM guidelines (CIEEM, 2018) with reference made to magnitude, extent, duration and reversibility, as appropriate.

Impacts will be considered during the construction and operational phases and will be assessed on the basis that a clearly defined range of avoidance and standard good practice measures are implemented.

Significant Effects

CIEEM guidelines (CIEEM, 2018) define a ‘significant effect’ as an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general (i.e. the feature could be positively or negatively significantly affected).

CIEEM guidelines (CIEEM, 2018) on ecological impact assessment note that, "A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures as long as the mitigation hierarchy has been applied effectively as part of the decision-making process."

CIEEM guidelines (2018) do not recommend the sole use of a matrix table as commonly set out in EIAR chapters to determine 'significant' and 'not significant' effects. Table 7-2 sets out adapted CIEEM terminology and equivalent in the context of the EIA Regulations 2017 which would be used in the assessment.

Major and moderate effects are considered significant in the context of the EIA Regulations.

Table 7-2: Effect (EIA Significance)

Significance	Definition	
Significant	Major Adverse/ Beneficial	A medium or high, medium or long-term adverse or beneficial effect upon the integrity of an ecological feature at a national (Scottish) or international level.

¹² To include (but not restricted to) Conservation of Habitats and Species Regulations 2017, as amended in Scotland by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 (collectively ‘the Habitats Regulations’), the WCA, the Wildlife and Natural Environment (Scotland) Act 2011, NPF4, NCA, Highland-wide Local Development Plan and Highland Nature Biodiversity Action Plan 2021-2026. Note, Section 5 ‘Planning Policy and Guidance’ of this report summarises the key planning policy relevant to the Proposed Development.

Significance	Definition	
	Moderate Adverse/ Beneficial	A high or very high, long-term or permanent adverse or beneficial effect upon the integrity of an ecological feature at a regional level or above.
Not significant	Minor Adverse/ Beneficial	A low or medium, short-term or long-term adverse or beneficial effect upon the integrity of an ecological feature at a regional level or below
	Negligible/ Beneficial	A negligible or low adverse or beneficial effect upon the integrity of an ecological feature, typically at a site level or below.

Potentially significant effects identified will be expressed with reference to an appropriate geographic scale. For example, a significant effect on a nationally designated site is likely to be of national significance. However, the scale of significance does not necessarily always relate to the importance of an ecological feature. For example, an effect on a species which is considered of national importance, may not have a significant effect upon its national population.

In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect will be assumed as a precautionary approach. Where uncertainty exists, this will be acknowledged in the EIA Report.

Cumulative Impacts

The potential for cumulative effects on ecological features, in combination with other wind farm proposals will be assessed in accordance with NatureScot's guidance (SNH, 2012) but will be restricted to those developments located within the same hydrological catchment(s) or within the regular range of mobile species (e.g. bats).

The assessment will encompass the effects of the Proposed Development in-combination with existing developments, either built or under construction; approved developments; awaiting implementation; and proposals awaiting determination within the planning process with design information in the public domain.

The inclusion of additional non-wind farm proposals is not proposed unless specifically requested by NatureScot.

Avoidance and Mitigation

The adoption of embedded mitigation measures to avoid or minimise adverse impacts upon ecological features will be part of the iterative design process for the Proposed Development.

Measures to avoid or otherwise minimise potentially adverse impacts upon ecological features during scheme design will include:

- the Proposed Development's infrastructure will be designed to minimise the requirement for land-take and the number of watercourse crossings and woodland felling;
- new watercourse crossings, where required, will be designed in accordance with best practice and enable the free passage of fish and other wildlife;
- a minimum 50m buffer between the Proposed Development's infrastructure will be applied around all watercourses in so far as possible having regard to other ecological and non-ecological constraints;
- a CEMP (or similar) will be in place during the construction, operational and decommissioning phases of the development. The CEMP will include all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the Proposed Development in line with current guidance; and
- a minimum 50m buffer (from blade tip) will be applied to watercourses and woodland in so far as is possible.

Full details of embedded mitigation measures to be adopted in relation to ecology will be detailed within the EIA Report. In accordance with the principles of proportionate EIA, these measures will be considered at the outset of the assessment process, in determining the likely 'importance' of ecological features in the context of the Proposed Development.

Residual Effects

An assessment to determine the significance of residual ecological effects (those remaining after mitigation measures) will be undertaken.

Enhancement

Suitable principles for ecological enhancement to be delivered as part of the Proposed Development will be outlined within the EIA Report, and with consideration given to the requirements of NPF4. The appropriateness and feasibility of principles will be discussed with NatureScot and other relevant consultees over the course of the EIA, with a view to prescriptive enhancement measures being detailed post-consent, within a Habitat Management Plan (HMP). An Outline HMP will be presented in the EIA Report.

7.4 Consultation

Consultation with NatureScot was undertaken in September 2019, prior to the commencement of baseline ecological gathering, to detail the proposed scope for ecological surveys. In consultation, NatureScot (Operations Officer for South Highland) confirmed they were satisfied with the proposed approach to baseline ecological surveys (email response dated 24 October 2019).

Full details of consultations undertaken over the course of the EIA will be presented within the EIA Report.

7.5 Matters Scoped Out

The above scope is based on the requirement for the EIA to consider likely significant effects of the Proposed Development. Effects that are not likely to be significant do not require assessing under the EIA regulations. CIEEM (2018) guidance further allows features to be scoped out if they are not considered as 'important'.

On review of desk study and guidance, the following are scoped out of detailed assessment in relation to Ecology:

- based on the distances from the site, and the features for which they are designated, there is considered to be no connectivity and therefore no anticipated significant effects between the site and statutory designated sites with ecological qualifying features listed in Table 7-1;
- based on the distances from the site there is considered to be no connectivity and therefore no anticipated significant effects between the site and non-statutory designated sites, with all such sites >9.5km from the site;
- effects on habitats and species (excluding bats) during operation are scoped out. No further damage is anticipated to habitats during operation, and maintenance visits will be rare and unlikely to result in disturbance to protected species;
- invertebrates, reptiles and amphibians are scoped out of the assessment in accordance with NatureScot guidance (NatureScot, 2022) and embedded mitigation to be implemented; and
- non-wind farm proposals are scoped out for the cumulative assessment.

7.6 Questions to Consultees

- Q7.1 Do consultees agree that the range of ecology surveys to be carried out is sufficient and appropriate?
- Q7.2 Do consultees agree that the survey areas and buffers to be adopted for each ecology survey is considered appropriate?
- Q7.3 Do consultees agree with the approach to the ecology surveys to be undertaken?
- Q7.4 Do consultees agree with those ecology surveys which have been scoped out?
- Q7.5 Do consultees agree with those ecology features which have been scoped out from the EIA?

- Q7.6 Are there any other relevant consultees who should be contacted, or other sources of information that should be referenced with respect to the ecology assessment?
- Q7.7 Do consultees agree that it is reasonable to consider embedded mitigation at the outset of assessment, and scope those important ecology features for which embedded mitigation will be sufficient to prevent significant effects out of detailed assessment?
- Q7.8 Do consultees agree with the approach to the cumulative assessment? Are there any specific non-wind energy developments that consultees believe should be considered for inclusion within the cumulative impact assessment? If so, please advise of planning references for these.

7.7 References and Standard Guidance

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

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8. Ornithology

8.1 Introduction

This section of the report has been written by Dr Colin Bonnington DPhil MSc BSc (Hons.) MCIEEM who has over 10 years' experience as a professional ecologist specialising in renewable energy projects and has contributed to, and lead, the ornithology aspect of many large-scale renewable developments, including wind farm projects.

8.2 Environmental Baseline and Potential Sources of Impact

8.2.1 Scope of Study and Study Area

This section has been prepared by Avian Ecology and provides a summary of baseline ornithological information collected to date, and the proposed approach to assessment in accordance with best practice guidance.

Chapter 8: Ornithology of the EIA Report will assess the potential effects of the Proposed Development on important ornithological features and will detail proposed mitigation measures required to avoid, minimise, restore or offset adverse effects. It will also outline proposals for habitat enhancement where appropriate, to be further detailed and agreed post consent in consultation with relevant interested parties.

Important ornithological features that will be considered within the EIA Report will include:

- relevant statutory designated sites, and their cited qualifying interests, such as SSSIs, SPAs and Ramsar sites; and
- populations of ornithological species listed on Annex IV of the EC Habitats Directive¹³ or Schedule 5 of the Wildlife & Countryside Act 1981 (as amended), or which are scarce, or a priority for conservation under the UK BAP and/or SBL¹⁴.

Study areas for baseline ornithological information gathering have been based upon the site boundary and specific survey type, and have been established in accordance with best practice guidance. Study areas adopted will be updated over the course of the EIA to account for changes in scheme design and where land access permissions allow.

The study areas for the desk studies are a minimum of 2km extent from the site for notable, rare and/or protected avian species, extended to 10km for eagles. Statutory designated sites out to 10km from the site with ornithological interests were regarded, extended to 20km for statutory designated sites with migratory goose interests.

8.2.2 Baseline Conditions including Field Studies

Baseline ornithological conditions to inform the design and assessment of the impacts of the Proposed Development will be established through desk study and field surveys. Full details will be presented within the EIA Report.

A brief summary of the desk studies and field surveys completed or scheduled is provided below.

Desk Study

A desk study has been undertaken in 2019, 2020 and 2023 to provide further baseline information to

¹³ Council Directive 1992/43/EEC on the conservation of natural habitats and of wild fauna and flora.

¹⁴ <https://www.nature.scot/scottish-biodiversity-list> [Accessed 14/04/2023]

supplement, and inform, the field studies.

The following key sources, applicable at the time, were consulted:

- Sitelink¹⁵;
- aerial imagery¹⁶;
- NatureScot guidance 'General pre-application and scoping advice for onshore wind farms' (NatureScot, 2022);
- NatureScot guidance on bird survey methods at onshore wind farm (SNH, 2017);
- NatureScot guidance on assessing significance of impacts from onshore wind farms outwith designated sites (SNH, 2018a);
- NatureScot guidance on assessing connectivity with Special Protection Areas (SPAs) (SNH, 2016);
- RSPB for records of protected, rare and/or notable avian species, within 6km (extended to 10km for eagles), of the site;
- Highland Raptor Study Group for records of raptors and owls within 2km (extended to 6km for eagles), of the site; and
- Highland Biological Recording Group (HBRG) for records of non-statutory sites, and protected, rare and/or notable avian species, within 2km (extended to 10km for Annex 1/Schedule 1 raptors), of the site¹⁷.

Documentation which supported the previous Carn Gorm Wind Farm application (THC Ref: 13/04791/FUL) for the site has also been reviewed and results therein provide some further baseline context.

In addition, the ornithological field team has considerable experience in the survey of comparable sites in the Highlands and across Scotland and are accordingly knowledgeable of the presence or potential presence of sensitive ornithological interests within the site and wider surrounding area.

Statutory Designated Sites for Nature Conservation

Statutory (international and national) designated sites located within 10km of the site, extended to 20km for SPAs and/or Ramsar sites with migratory goose interests, are shown on Figure 8.1 and summarised in Table 8-1. Note, only those with ornithological interests are considered here.

Table 8-1: Statutory Designated Sites for Nature Conservation with 10 km

Site Name	Approximate Distance from the site (km)	Qualifying Interests
Ben Wyvis SPA	2.93km, north-east	Breeding dotterel <i>Charadrius morinellus</i>
Ben Wyvis SSSI	1.58km, north-east	Breeding dotterel
Glen Affric to Strathconon SPA	3.81km, south-west	Breeding golden eagle <i>Aquila chrysaetos</i>
Cromarty Firth SPA & Ramsar	11.6km, east	<p><i>Breeding</i></p> <ul style="list-style-type: none"> • Osprey <i>Pandion haliaetus</i> • Common tern <i>Sterna hirundo</i> <p><i>Wintering</i></p> <ul style="list-style-type: none"> • Whooper swan <i>Cygnus</i> • Bar-tailed godwit <i>Limosa lapponica</i>

¹⁵ <https://sitelink.nature.scot/home> [Accessed 13/04/2023]

¹⁶ <https://www.google.com/maps/place/Garve+IV23+2PR/@57.6219759,-4.6587246,7380m/data=!3m1!1e3!4m6!3m5!1s0x488e3f458ab01825:0x2145ec9db8b89dc9!8m2!3d57.617104!4d-4.689967!16s%2Fm%2F0ch2ky> [Accessed 13/04/2023]

¹⁷ <https://www.hbrg.org.uk/> [Accessed 13/04/2023]

Site Name	Approximate Distance from the site (km)	Qualifying Interests
		<ul style="list-style-type: none"> • Greylag goose <i>Anser anser</i> • Wintering bird assemblage in excess of 20,000 individual waterfowl, incl. redshank <i>Tringa tetanus</i>, curlew <i>Numenius arquata</i> and pintail <i>Anas acuta</i>
Inner Moray Firth SPA & Ramsar	17.3km , south-east	<p>Breeding</p> <ul style="list-style-type: none"> • Osprey • Common tern <p>Wintering</p> <ul style="list-style-type: none"> • Bar-tailed godwit • Greylag goose • Red-breasted merganser • Redshank • Wintering bird assemblage in excess of 20,000 individual waterfowl, incl. curlew and goldeneye <i>Bucephala clangula</i>

Non-Statutory Designated Sites for Nature Conservation

Desk study records returned show that there are no non-statutory sites for nature conservation within 2km of the Site. The nearest such site is Tollie Red Kites RSPB Reserve approximately 9.5km south-east from the site.

Field Studies

The scope of field surveys has been determined through a review of key sources listed above. In accordance with NatureScot guidance (SNH, 2017) two years of ornithological surveys are required, unless it can be demonstrated that a reduced survey effort is appropriate. The following field studies were undertaken to establish baseline ornithological conditions and potentially important ornithological features within the site and surrounding area, which may be impacted by the Proposed Development:

- VP Flight Activity Survey (September 2019 to August 2021) covering indicative turbine locations at the time of survey plus a 500m buffer;
- Moorland Breeding Bird Survey (MBBS) comprising four visits covering the site extent plus 500m, where accessible, from April to July 2020 and 2021;
- Annex 1 and Schedule 1 Breeding Raptor and Owl Searches covering the site extent plus 2km (extended to 6km for eagles (where accessible), from April to August 2020 and 2021;
- Breeding Black Grouse Survey covering the site plus 1.5km, where accessible, in March and April 2020 and 2021; and
- Breeding Diver Searches covering suitable waterbodies within the site plus 1km, where accessible, between April and June 2020 and 2021.

All ornithological surveys were carried out in accordance with NatureScot guidance (SNH, 2017).

Target Species

In review of existing ornithological information, the key ornithological sensitivities identified for this site, are considered to comprise the following target species, in accordance with NatureScot guidance (SNH, 2017 and 2018a):

- all Annex 1 and Schedule 1 raptors and owls;
- all divers;
- dotterel;
- black grouse *Tetrao tertix*; and
- all other waders and waterfowl, including greylag goose (excluding feral species and mallard *Anas platyrhynchos*).

Secondary species comprised all non-Schedule 1 and non-Annex 1 raptors (buzzard *Buteo buteo*, kestrel *Falco tinnunculus* and sparrowhawk *Accipiter nisus*), all gulls and any notable passerines e.g. Red-listed Birds of Conservation Concern (Stanbury *et al.*, 2021), and those listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

VP Flight Activity Survey

Prior to the surveys commencing a reconnaissance visit was undertaken in early September 2019 to appraise the most suitable locations for VPs, providing appropriate coverage of the VP flight activity survey study area (proposed turbines plus 500m).

Four VPs were used in year 1, between September 2019 and August 2020, and year 2, between September 2020 and August 2021. The number of hours carried out at each VP in both survey years exceeded the minimum number of 72 hours required by NatureScot (SNH, 2017), with between 99hrs and 108hrs per VP undertaken per year. This included additional hours carried out early in the breeding season (February to April) and in late summer/early autumn (September and October), coinciding respectively with the main periods of golden eagle courtship and display, and juvenile eagle dispersal.

The four VP locations used were:

- VP1 – NH 43860 61984;
- VP2 – NH 42842 63059;
- VP3 – NH 41139 61145; and
- VP4 – NH 40537 64886.

Figure 8.2 provides a plan showing all VP locations and viewsheds.

Note, due to changes in Proposed Development layout subsequent to surveys ending a small number (1-2) of indicative turbines do not have full coverage. It is expected that layout will be refined further prior to EIA but should there be any gaps in survey coverage or deviations from standard guidance, these will be acknowledged and addressed in the EIA chapter.

Total VP flight activity across the two-year survey period was highest for red kite (77 flights) and golden eagle (65 flights), with modest numbers recorded (≤ 8 flights) of 18 other target species.

Collision Risk Modelling (CRM) will be undertaken on those target species with sufficient data to provide a robust assessment.

Breeding Bird Surveys

The range of breeding wetland species within the study area was narrow, and included teal *Anas crecca*, snipe *Gallinago gallinago*, curlew, greenshank *Tringa nebularia*, golden plover *Pluvialis apricaria* and ptarmigan *Lagopus mutus*, with the number of breeding territories typically low (<2 territories).

The site did not support any nesting Annex 1 and/or Schedule 1 raptors or owls, but the wider study area did support a pair of breeding peregrines, at least two pairs of breeding osprey, a suspected breeding pair of barn owls and a suspected breeding pair of golden eagles.

No breeding divers were recorded within the study area.

Black grouse were recorded within the study area, with up to seven lek sites identified across the two-year survey period. The leks were small (≤ 3 males), with the maximum number of birds recorded at any one lek 5; 1 male and 4 females.

8.2.3 Potential Sources of Impact

The EIA Report will consider the potential for significant adverse impacts upon important ornithological features, which could arise during the construction, operational and decommissioning phases of the Proposed Development.

The assessment process will be informed by baseline ornithological information obtained through desk study and field surveys and through consultation with relevant specialist groups, as required.

Assessment of likely impacts upon golden eagles will be informed by a Golden Eagle Topographical (GET) model. This will assess whether losses to habitat during the construction and operation of the Proposed Development is likely to have a significant impact on any territorial golden eagles at the locality. This will be determined through an assessment of habitat loss from the Proposed Development in the context of the availability of suitable habitat for eagles in the wider area. The GET model will be provided as a Technical Appendix and the results will be considered in the EIA Report.

Construction

During construction of the Proposed Development, in the absence of mitigation, potentially significant adverse impacts upon important ornithological features to be assessed within the EIA Report may arise from:

- habitat loss, fragmentation or change as a result of the delivery and installation of Proposed Development infrastructure; and
- disturbance to, and loss of, nest sites, eggs and/or dependent young.

Construction activities are predicted to result in a temporary increase in noise, vibration and human presence within construction areas. This has the potential to displace birds from the vicinity of construction areas for the duration of construction works.

The potential for direct disturbance from construction on all designated sites listed in Table 8-1 is considered unlikely by virtue of spatial separation from the designated sites, and the documented disturbance distances of the qualifying species¹⁸ (taken from Goodship and Furness, 2022).

Overall construction disturbance would be considered temporary and would occur only when construction activities are taking place. Furthermore, construction would be not expected to take place over the whole site, but within defined working areas, phased over small areas.

Operation

The operation of turbines and maintenance activities has the potential to cause disturbance and displacement of birds throughout the Proposed Development's operational lifetime. The extent of displacement is, however, highly variable between species and species-group and therefore a species-specific assessment will take place based on results of baseline studies.

The risk of avian mortality resulting from the collision of birds with the turbine blades (or additional wind farm infrastructure) is also acknowledged to be higher for some species due to their biometrics and flight behaviour. The likelihood of collision is also likely to be influenced by the type of habitats within the site and the surrounding area.

Where sufficient flight activity data is recorded, Collision Risk Models (CRM) following the Band Model and in accordance with NatureScot guidance (Band *et al.*, 2007; SNH, 2000) will be undertaken to quantify the likelihood of mortality for target species. If there are sufficient at-risk flights (≥ 3 flights in the 'collision risk zone') likely impacts upon wintering greylag geese which may use Cromarty Firth SPA and Ramsar, and/or Inner Moray Firth SPA and Ramsar will be considered in the ecological impact assessment, given these sites are within the documented foraging distance for the species (from SNH, 2016). Likely impacts of the operational phase of the Proposed Development on golden eagles will be considered in the context of CRM and the GET model. It is proposed that information from the field studies, GET model and gathered desk study information will help establish whether the golden eagles recorded during field studies are likely to be breeding birds from the Glen Affric to Strathconon SPA. Dependent on the outcome of this appraisal, impacts on the SPA (breeding golden eagles) may need

¹⁸ In the absence of documented disturbance distances for breeding dotterel, the respective maximum disturbance distance for breeding golden plover (a comparable moorland nesting wader) is used as a proxy.

to be considered in the ecological impact assessment. Information to inform Habitats Regulations Appraisal for these SPAs will be provided irrespective of their inclusion, or otherwise, in the EclA.

There is unlikely to be an impact on any other ornithological interests of any designated site for nature conservation during the operation of the Proposed Development, due to the spatial separation of other designated sites with ornithological interest from the site and the species documented core foraging ranges (from SNH, 2016).

Decommissioning

Potential impacts associated with the decommissioning phase are likely to be similar to those identified for the construction phase and will not be discussed in detail within the EIA Report, decommissioning is likely to be addressed by a condition on the consent requiring a decommissioning plan to be submitted for approval towards the end of life of the Proposed Development.

8.3 Method of Assessment and Reporting

Impact assessment presented within the EIA Report for ornithological features will be undertaken in accordance with NatureScot guidance (SNH, 2018a) and will be based on current CIEEM guidance (CIEEM, 2018).

The assessment process will include the following stages:

- determination and evaluation of important ornithological features;
- identification and characterisation of impacts;
- outlining mitigation measures to avoid and reduce significant impacts;
- assessment of the significance of any residual effects after such measures; and
- identification of opportunities for ornithological enhancement.

The EIA Report will be supported by Technical Appendices and relevant figures, which will provide full details of desk studies, consultations and field studies undertaken to inform the design and assessment of the Proposed Development.

Ornithological data considered sensitive (e.g. that pertaining to the breeding and/or nest sites of Schedule 1 raptors) will be included within a confidential appendix to the EIA Report. This will not be made publicly available but will be issued to NatureScot and THC.

Sufficient information will be presented within the EIA Report to allow an objective and robust assessment of potentially significant adverse impacts upon important ornithological features to take place.

Determining Importance

The EIA Report will only assess in detail impacts upon important ornithological features which are likely to be significantly affected by the Proposed Development. A detailed assessment of features that are sufficiently widespread, unthreatened and resilient to impacts of the Proposed Development will not be undertaken and justification for “scoping out” will be provided.

Relevant European, national and local legislation and policy¹⁹ and guidance will be referred to in order to determine the importance (or ‘sensitivity’) of ornithological features. In addition, importance will also be determined using professional judgement, specialist consultation advice and the results of baseline surveys and the importance of features within the context of the geographical area.

Important ornithological features will broadly include:

¹⁹ To include (but not restricted to) Conservation of Habitats and Species Regulations 2017, as amended in Scotland by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 (collectively ‘the Habitats Regulations’), the WCA, the Wildlife and Natural Environment (Scotland) Act 2011, NPF4, NCA, Highland-wide Local Development Plan and Highland Nature Biodiversity Action Plan 2021-2026. Note, Section 5 ‘Planning Policy and Guidance’ of this report summarises the key planning policy relevant to the Proposed Development.

- species listed on Annex 1 of the Birds Directive;
- species listed on Schedule 1 of the Wildlife and Countryside Act; and
- 'priority bird species for assessment when considering the development of onshore wind farms in Scotland' as listed on Annex 1 of NatureScot guidance (SNH, 2018a).

Importance will not necessarily relate solely to the level of legal protection that a feature receives, and ornithological features may be important for a variety of reasons, such as their connectivity to a designated site and the rarity of species or the geographical location of species relative to their known range.

The importance of ecological features will be defined in a geographical context from 'Local' to 'International'.

Identification and Characterisation of Impacts

The identification and characterisation of impacts on important ornithological features will be undertaken in accordance with the CIEEM guidelines (CIEEM, 2018) with reference made to magnitude, extent, duration and reversibility, as appropriate.

Impacts will be considered during the construction and operational phases and will be assessed on the basis that a clearly defined range of avoidance and standard good practice measures are implemented.

Significant Effects

For the purposes of assessment, the significance of effects will primarily be expressed within the EIA Report with reference to the regional, national or international scale (as relevant) in line with NatureScot's interests of bird species status at wider spatial levels. The significance of effects at a local scale may also be assessed where sufficient information allows a meaningful assessment.

CIEEM guidelines (2018) do not recommend the sole use of a matrix table as commonly set out in EIAR chapters to determine 'significant' and 'not significant' effects. Table 8-2 sets out adapted CIEEM terminology and equivalent in the context of the EIA Regulations 2017 which would be used in the assessment.

Major and moderate effects are considered significant in the context of the EIA Regulations.

Table 8-2: Effect (EIA Significance)

Significance	Definition	
Significant	Major Adverse/ Beneficial	A medium or high, medium or long-term adverse or beneficial effect upon the integrity of an ornithological receptor at a National (Scottish) or International level.
	Moderate Adverse/ Beneficial	A high or very high, long-term or permanent adverse or beneficial effect upon the integrity of an ornithological receptor at a Regional Natural Heritage Zone (NHZ) level (or suitable alternative) or above.
Not significant	Minor Adverse/ Beneficial	A low or medium, short-term or long-term adverse or beneficial effect upon the integrity of an ornithological receptor at a Regional (NHZ) level (or suitable alternative) or below.
	Negligible/ Beneficial	A negligible or low adverse or beneficial effect upon the integrity of an ornithological receptor, typically at a Site level or below.

The assessment of effects will be undertaken taking into consideration collated field study information and information available from the desk study. Bird flight activity data will be collated and analysed to assess the potential risk to individual species of conservation concern from collision mortality, following the method described by Band *et al.* (2007).

In order to assess significance, population information will be collated on relevant regional and national scales, where available. A precautionary approach on the basis of uncertainty, will be adopted.

Cumulative Impacts

The potential for cumulative effects on ornithological features, in combination with other wind farm proposals will be assessed in accordance with NatureScot's guidance (SNH, 2012 & SNH, 2018b). The potential for significant cumulative effects due to habitat loss, disturbance/displacement and collision risk mortality will be assessed. The assessment will be based on the consideration of residual effects i.e. assuming that proposed mitigation measures (where relevant) are implemented.

The assessment will encompass the effects of the Proposed Development in-combination with existing developments, either built or under construction; approved developments; awaiting implementation; and proposals awaiting determination within the planning process with design information in the public domain.

The inclusion of additional non-wind farm proposals is not proposed unless specifically requested by NatureScot.

With regard to the spatial extent of the cumulative assessment, NatureScot guidance (SNH, 2012 & SNH 2018b) stipulates that cumulative effects should typically be assessed at the relevant Regional Natural Heritage Zone (NHZ) scale, unless there is a reasonable alternative. The Proposed Development is located within the 'Northern Highlands' NHZ 7 (Wilson *et al.*, 2015). It is therefore proposed that where the availability of relevant information is sufficient to allow for a meaningful cumulative assessment at the 'Northern Highlands' NHZ 7 scale to be undertaken, this will be done.

NatureScot guidance (SNH, 2012) does however recognise that access to relevant data for other developments may be limited and therefore a meaningful assessment of cumulative effects of such developments is not always possible. It is our understanding that NatureScot are in the process of collating a list of other wind farm developments within each NHZ, along with documented impacts on key species (particularly CRM estimates) as a result of these developments. If available, and shared by NatureScot, we propose using the information from NHZ 7 to assess impacts on key species in-combination with other wind farm developments. It is considered that key species will include golden eagle and red kite. If not available, however, we propose an alternative approach, whereby the core foraging range for each species (taken from SNH, 2016) requiring consideration will be used to determine the spatial extent of the cumulative assessment, adopting a precautionary approach as necessary.

Habitat Regulations Appraisal

The site is located 3.81km from Glen Affric to Strathconon SPA, which has breeding golden eagle as its sole qualifying feature. The EIA Report will therefore provide sufficient information to allow the competent authority to undertake a Habitats Regulations Appraisal (HRA) of the Proposed Development in relation to the Glen Affric to Strathconon SPA. The site is also located within the core foraging range of wintering greylag geese which is a qualifying feature of the Cromarty Firth SPA and Ramsar, and Inner Moray Firth SPA and Ramsar. The EIA Report will therefore provide sufficient information to allow the competent authority to undertake a HRA of the Proposed Development in relation to these designated sites in relation to migratory greylag geese.

The site is not located within the core foraging range for the qualifying interests of any other SPA and/or Ramsar (taken from SNH, 2016) and as such, the potential for connectivity between the site and any other such designated site has been discounted. This includes the Ben Wyvis SPA, which is 2.93km from the site, and designated for breeding dotterel. Although foraging ranges for dotterel are not documented, the SPA is considered sufficiently distanced from the site for impacts on dotterel using the Ben Wyvis SPA to be discounted. Particularly given no dotterel were recorded during field studies, or within 6km of the site (within the last 20 years) based on desk study data.

Avoidance and Mitigation

The adoption of embedded mitigation measures to avoid or minimise adverse impacts upon ornithological features will be part of the iterative design process for the Proposed Development.

Full details of the scheme design evolution and embedded mitigation measures in relation to ornithology will be detailed within the EIA Report. In accordance with the principles of proportionate EIA, these measures will be considered at the outset of the assessment process, in determining the likely 'importance' of ornithological features in the context of the Proposed Development. This will include the specification of any species-specific working buffers as a necessary requirement for the production of a breeding bird protection plan to ensure legislative compliance in line with current good practice

guidance. This is likely to include appropriate buffers from the Proposed Development around main black grouse lek sites and the nest sites of breeding Schedule 1 raptors.

Residual Effects

An assessment to determine the significance of residual ornithological effects (those remaining after mitigation measures) will be undertaken.

Enhancement

Suitable principles for biodiversity enhancement to be delivered as part of the Proposed Development will be outlined within the EIA Report, and with consideration given to the requirements of NPF4. The appropriateness and feasibility of principles will be discussed with NatureScot and other relevant consultees over the course of the EIA, with a view to prescriptive enhancement measures being detailed post-consent, within a Habitat Management Plan (HMP). An Outline HMP will be presented in the EIA Report.

8.4 Consultation

Consultation with NatureScot was undertaken in September 2019, prior to the commencement of baseline ornithological gathering, to detail the proposed scope for ornithological surveys. In consultation, NatureScot (Operations Officer for South Highland) confirmed they were satisfied with the proposed approach to baseline ornithological surveys (email response dated 24 October 2019).

Full details of consultations undertaken over the course of the EIA will be presented within the EIA Report.

8.5 Matters Scoped Out

The above scope is based on the requirement for the EIA to consider likely significance of effects arising from the Proposed Development. Effects that are not likely to be significant do not require assessing under the EIA regulations. CIEEM (2018) guidance further allows features to be scoped out if they are not considered as 'important' in an ecological context.

On review of desk study, guidance, and the results of two-years of field studies, the following are scoped out of detailed assessment in relation to Ornithology:

- Firth SPA and Ramsar (with the exception of greylag goose) and Inner Moray Firth SPA and Ramsar (with the exception of greylag goose);
- based on the distances from the site there is considered to be no connectivity and therefore no anticipated significant effects between the site and non-statutory designated sites, with all such sites ≥ 9.5 km from the site;
- based on the distances from the site, the core foraging ranges for the species for which they are designated (and information from baseline studies), there is considered to be no connectivity and therefore no anticipated significant effects between the site and Ben Wyvis SPA and SSSI, Cromarty
- given the lack of records from baseline studies breeding divers are scoped out of the assessment;
- moorland passerines are scoped out of the assessment in accordance with NatureScot guidance (SNH, 2017);
- target species with only a modest number of at-risk flights (< 3) will not be subject to CRM for the assessment; and
- non-wind farm proposals are scoped out for the cumulative assessment.

8.6 Questions to Consultees

- Q8.1 Do consultees agree that the range of ornithology surveys that have been carried out is sufficient and appropriate?
- Q8.2 Do consultees agree that the survey areas and buffers to be adopted for each ornithology survey is considered appropriate?
- Q8.3 Do consultees agree with the approach to the ornithology surveys undertaken?
- Q8.4 Do consultees agree with those ornithology features which have been scoped out from the EIA?
- Q8.5 Are there any other relevant consultees who should be contacted, or other sources of information that should be referenced with respect to the ornithology assessment?
- Q8.6 Do consultees agree with the approach to the cumulative assessment? Are there any specific non-wind energy developments that consultees believe should be considered for inclusion within the cumulative impact assessment? If so, please advise of planning references for these.
- Q8.7 Are there any other relevant consultees who should be contacted, or other sources of information that should be referenced with respect to the ornithology assessment?
- Q8.8 Are there any specific non-wind energy developments that consultees believe should be considered for inclusion within the cumulative impact assessment? If so, please advise of planning references for these.
- Q8.9 Can NatureScot or RSPB Scotland provide any up-to-date population numbers of golden eagle of the Glen Affric to Strathconon SPA, and wintering greylag goose population numbers of the Cromarty Firth SPA and Ramsar, and Inner Moray Firth SPA and Ramsar, to inform the assessment?
- Q8.10 Can NatureScot provide an up-to-date list of those wind farm developments within the Northern Highlands NHZ which should be considered within the cumulative assessment? Can NatureScot provide a list of acceptable cumulative collision risks for golden eagle and (wintering) greylag goose, and for all ornithological species listed in Annex 1 of their guidance (NatureScot, 2018) for those wind farm developments within the Northern Highlands NHZ?

8.7 References and Standard Guidance

Band, W., M. Madders, and D. P. Whitfield. (2007) Developing field and analytical methods to assess avian collision risk at wind farms. Pages 259–275 in M. de Lucas, G. F. E. Janss, and M. Ferrer, editors. Birds and wind farms: risk assessment and mitigation. Quercus, Madrid, Spain.

CIEEM (2018) Guidelines for ecological impact assessment in the UK and Ireland. Available at: <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.1Update.pdf> [Accessed 14/04/2023]

Goodship, N.M. and Furness, R.W. (2022) Disturbance distances review: an updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283.

NatureScot (2022) General pre-application and scoping advice for onshore wind farms. Available at: <https://www.nature.scot/doc/general-pre-application-and-scoping-advice-onshore-wind-farms> [Accessed 13/04/2023].

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

SNH (2016) Assessing the connectivity with Special Protection Areas (SPAs). Guidance. Version 3 – June 2016.

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

SNH (2018a) Assessing Significance of Impacts from Onshore Wind Farms outwith Designated Sites. SNH, Inverness.

SNH (2018b) Assessing the cumulative impacts of onshore wind farms on birds. Guidance. August 2018.

Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble D. and Win, I. (2021) The status of our bird populations: the five birds of conservation concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red list assessment of extinction risk for Great Britain. *British Birds* 114, 723-747.

Wilson, M. W., Austin, G. E., Gillings, S. and Wernham, C. V. (2015) Natural Heritage Zone Bird Population Estimates. SWBSG Commissioned report number SWBSG_1504pp 72.

9. Geology, Hydrogeology, Hydrology and Soils

9.1 Introduction

This section of the report has been written by Gordon Robb (BSc, MSc, MBA, C.WEM, FCIWEM) who has more than 25 years' experience assessing wind, transmission and renewable energy projects in Scotland.

9.2 Environmental Baseline and Potential Sources of Impact

9.2.1 Scope of Study and Study Area

This section outlines the proposed scope of the EIA Report to assess the significant effects from the Proposed Development on soils, geology, hydrogeology, and hydrology.

The study area will include all the proposed site infrastructure and a 500m buffer from the Proposed Development boundary.

The study area for potential cumulative effects will use the catchments within the study area, with a maximum distance of 5km from the Proposed Development. Beyond this 5 km distance, any effect is considered to be so diminished as to be undetectable and therefore not significant.

9.2.2 Baseline Conditions including Field Studies

The site is located approximately 1.7 km north east of Garve and 1.4 km north of Loch Garve.

Elevations on the site vary between 130 m Above Ordnance Datum (AOD) along the proposed access route to 471 m AOD at the summit of Beinn a'Ghuilbein within the centre of the site. Elevations generally decrease towards the west and south towards Alltan Dubh / Black Water and Loch Garve respectively. The annual rainfall recorded in the vicinity of the site in 2022 was 705 mm per annum in 2022.

Geology and Hydrogeology

The majority of the Proposed Development is shown by the British Geological Survey (BGS) to be underlain by bedrock of the Glenfinnan Group, comprising pelite, semipelite and psammities. The northern extent of the site is shown to be underlain by the Crom Psammite Formation (psammite) and the Vaich Pelite Formation (semipelite and garnet). Two inferred faults are noted within the north western extent of the site, one of which is shown to be a thrust fault which separates the Glenfinnan Group and the Crom Psammite Formation.

The hill tops within the western and southern areas of the site, are shown by BGS to be absent of any superficial deposits. Where superficial deposits are found, particularly within the centre and northern extent of the site, they are recorded as peat and glacial deposits of diamicton, gravel, sand and silt.

The bedrock units beneath the site have been classified by BGS as low productivity aquifers whereby small amounts of groundwater is typically found in near surface weathered zones and secondary fractures.

Soils and Peat

Soil mapping indicates that the soils at the site comprise of peaty gleys, subalpine podzols and humus-iron podzols.

Published priority peatland mapping by NatureScot indicates that the majority of the central and western extent of the site is located within areas designated Class 1 with some Class 2 priority peatland which are considered to be of nationally important carbon rich soils, areas of deep peat and areas of high conservation value. Class 5 peat is also recorded over the site outwith areas of Class 1 and Class 2 priority peatland. The Class 5 carbon and peatland class indicates no peatland habitat recorded however, this class may also include areas of bare soil with carbon-rich soils and deep peat.

A Phase 1 peat probing exercise was completed in 2013 in support of the previous wind farm planning application. Review of this peat probing data confirms that peat was recorded across much of the site with pockets of deeper peat up to a maximum peat thickness of 3.1m recorded east of Beinn a'Ghuilbein. Approximately 82% of the peat probes recorded peat depths of less than 1m. Recorded peat depths are shown on **Figure 9.1**.

Hydrology and Designated Sites

The site lies entirely within the surface water catchment of the River Conon, in particular the sub catchment of Black Water (also known as the Alltan Dubh) to the north and west, Loch Garve within the centre and Loch na Croic to the south east. None of the surface water catchments have been designated as a Drinking Water Protected Area (DWPA).

Watercourses and groundwater may support private water supplies due to the rural location of the site.

SEPA flood mapping confirms that the majority of the site is not at risk from flooding. Flood extents within the site are typically confined to the watercourse corridors and loch edges.

Review of the NatureScot SiteLink website confirms that no designated sites lie within the site boundary or are hydraulically connected to the site.

9.2.3 Potential Sources of Impact

Without mitigation or adherence to best practice, impacts on soils and peat, geology, hydrology and hydrogeology could occur during the two main stages of development (construction and operation). A summary of the potential effects on ground conditions and the water environment resulting from construction, and operation of the Proposed Development is provided below. These will be considered in the EIA Report.

Potential Impacts During Construction

- disturbance and loss of peat deposits and carbon rich soils;
- ground instability (inc. peat slide risk);
- impacts on surface water and groundwater quality from pollution from fuel, oil, concrete or other hazardous substances;
- discharge of sediment-laden runoff to drainage system and watercourses;
- increased flood risk to areas downstream of the site during construction through increased surface run-off;
- changes in groundwater levels from dewatering excavations;
- potential change of groundwater flow paths and contribution to areas of peat and Groundwater Dependent Terrestrial Ecosystems (GWDTEs);
- disturbance of watercourse bed and banks from the construction of culverts;
- potential pollution impacts to public and private water supplies; and
- disturbance and / or pollution resulting from borrow pit formation and use.

Potential Impacts During Operation

- increased runoff rates and flood risks, resulting from increases in areas of tracks and hardstanding at turbines;
- changes in natural surface water drainage patterns (which may affect water contribution to areas of peat and GWDTE);
- changes to groundwater levels and groundwater movement;
- longer term impacts on abstraction for water supplies, particularly any supplies dependent on groundwater; and
- pollution impacts on surface water quality from maintenance work.

9.3 Method of Assessment and Reporting

The potential effects from the Proposed Development on ground conditions and the water environment will be assessed by completing a desk study and field investigation followed by an impact assessment,

the processes of which are detailed below. The assessment will use, where relevant, the findings of previous investigations completed at site.

9.3.1 Desk Study

An initial desk study will be undertaken to determine and confirm the baseline characteristics by reviewing available information relating to soils and peat, geology, hydrology, and hydrogeology such as groundwater resources, licensed and unlicensed groundwater and surface water abstractions, public and private water supplies, surface water flows, flooding, rainfall data, water quality and soil data. This will include review of published geological maps, Ordnance Survey maps, aerial photographs and site-specific data such as site investigation data, geological and hydrogeological reports, digital terrain models (slope plans) and geological literature.

The desk study will identify sensitive features which may potentially be affected by the Proposed Development and will confirm the geological, hydrogeological and hydrological environment.

9.3.2 Field Surveys

The hydrological assessment specialists will liaise closely with the project ecology and geology / geotechnical specialists to ensure that appropriate information is gathered to allow a comprehensive impact assessment to be completed.

A detailed site visit and walkover survey will be undertaken to:

- verify the information collected during the desk and baseline study;
- undertake a visual assessment of the main surface waters and identify private water supplies;
- identify drainage patterns, areas vulnerable to erosion or sediment deposition, and any pollution risks;
- visit any identified GWDTEs (in consultation with the project ecologists);
- visit private water supply sources that might be affected by the Proposed Development to confirm details of the location of the abstraction, its type and use, as required;
- prepare a schedule of potential watercourse crossings;
- assess the site geomorphology and conduct additional peat depth probing as required; and
- inspect rock exposures, establish by probing an estimate overburden thicknesses (a probe is pushed vertically into the ground to refusal and the depth is recorded).

The distribution and depth of peat at site will be subject to careful consideration. Additional peat depth probing is proposed and assessment of peat and carbon rich soils will be assessed in accordance with the requirements of NPF4. Further details are given below.

The desk study and field surveys will be used to identify potential development constraints and be used as part of the site design.

Once the desk study is completed and sensitive soil and peat, geological and water features are confirmed an impact assessment will be undertaken to assess the potential effects on soils and peat, geology and the water environment as a result of the construction and operation of the Proposed Development.

9.3.3 Assessment of Effects

The purpose of this assessment will be to:

- identify any areas susceptible to peat slide, using peat thickness and Digital Terrain Model (DTM) data to analyse slopes;
- assess potential effects on soils, peat and geology;
- confirm measures required to safeguard soils and peat and to present a peat management / carbon management plan;

- assist in the micro-siting of turbines and tracks in areas of no peat or shallow and least hydrogeologically and hydrologically sensitive areas by applying buffer zones around watercourses and other hydrological features;
- determine what the likely effects of the Proposed Development are on the hydrological regime, including water quality, flow and drainage;
- allow an assessment of potential effects on identified licensed and private water supplies;
- assess potential effects on water (including groundwater) dependent habitats;
- determine suitable mitigation measures to prevent significant hydrological and hydrogeological effects; and
- develop an acceptable code for working on the site that will adopt best practice procedures, effective management and control of onsite activities to reduce or offset any detrimental effects on the geological, hydrogeological and hydrological environment.

It is anticipated that the impact assessment might include the following technical appendices:

- peat landside hazard and risk assessment;
- peat management plan;
- schedule of watercourse crossings;
- private water supply risk assessment; and
- groundwater dependent terrestrial ecosystems risk assessment.

Methodology for Assessing Potential Likely Effects

A qualitative risk assessment methodology will be used to assess the significance of the potential effects. Two factors will be considered: the sensitivity of the receiving environment and the potential magnitude should that potential impact occur.

Sensitivity of Receptor

The sensitivity of the receiving environment (i.e., the baseline quality of the receiving environment) is defined as its ability to absorb an effect without a detectable change and can be considered through a combination of professional judgement and a set of pre-defined criteria which is set out in Table 9-1. Receptors in the receiving environment only need to meet one of the defined criteria to be categorised at the associated level of sensitivity.

Table 9-1: Sensitivity of Receptors

Sensitivity	Definition
<ul style="list-style-type: none"> • High 	<ul style="list-style-type: none"> • soil type or geology and associated land use is highly sensitive (e.g. unmodified blanket bog peatland) • SEPA Water Framework Directive Water Body Classification: High-Good or is close to the boundary of a classification: Moderate to Good or Good to High • receptor is of high ecological importance or National or International value (e.g. Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), habitat for protected species) which may be dependent upon the hydrology of the Development Area • receptor is at high risk from flooding above 0.5% Annual Exceedance Probability (AEP) and/or water body acts as an active floodplain or flood defence • receptor is used for public and/or private water supply (including Drinking Water Protected Areas)

Sensitivity	Definition
	<ul style="list-style-type: none"> groundwater vulnerability is classified as High if a Groundwater Dependent Terrestrial Ecosystem or Geological Conservation Review is present and identified as being of high sensitivity
<ul style="list-style-type: none"> Moderate 	<ul style="list-style-type: none"> soil type or geology and associated land use moderately sensitive (e.g. arable, commercial forestry) SEPA Water Framework Directive Water Body Classification: Moderate or is close to the boundary of a classification: Low to Moderate receptor is at moderate risk from flooding (0.1% AEP to 0.5% AEP) but does not act as an active floodplain or flood defence moderate classification of groundwater aquifer vulnerability
<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> soil type or geology and associated land use not sensitive to change in hydrological regime and associated land use (e.g. intensive grazing of sheep and cattle). SEPA Water Framework Directive Water Body Classification: Poor or Bad receptor is at low risk from flooding (less than 0.1% AEP) receptor not used for water supplies (public or private)
<ul style="list-style-type: none"> Not Sensitive 	<ul style="list-style-type: none"> receptor would not be affected by the Proposed Development e.g. lies within a different and unconnected hydrological / hydrogeological catchment

Magnitude of Impact or Change

The potential magnitude of impact would depend upon whether the potential effect would cause a fundamental, material or detectable change. In addition, the timing, scale, size and duration of the potential effect resulting from the Proposed Development are also determining factors. The criteria that have been used to assess the magnitude of impact are defined in Table 9-2.

Table 9-2: Magnitude of Impact

Magnitude	Criteria	Definition
Major	Results in a loss of attribute	<ul style="list-style-type: none"> Fundamental (long term or permanent) changes to the baseline soils, geology, hydrology, hydrogeology and water quality such as: <ul style="list-style-type: none"> permanent degradation and total loss of the soils habitat loss of important geological structure/features wholesale changes to watercourse channel, route, hydrology or hydrodynamics changes to the site resulting in an increase in runoff with flood potential and also significant changes to erosion and sedimentation patterns major changes to the water chemistry major changes to groundwater levels, flow regime and risk of groundwater flooding

Magnitude	Criteria	Definition
Medium	Results in impact on integrity of attribute or loss of part of attribute	<ul style="list-style-type: none"> • Material but non-fundamental and short to medium term changes to baseline soils, geology, hydrology, hydrogeology and water quality, such as: <ul style="list-style-type: none"> ○ loss of extensive areas of soils habitat, damage to important geological structures/features ○ some fundamental changes to watercourses, hydrology or hydrodynamics ○ changes to site resulting in an increase in runoff within system capacity ○ moderate changes to erosion and sedimentation patterns ○ moderate changes to the water chemistry of surface runoff and groundwater ○ moderate changes to groundwater levels, flow regime and risk of groundwater flooding
Low	Results in minor impact on attribute	<ul style="list-style-type: none"> • Detectable but non-material and transitory changes to the baseline soils, geology, hydrology, hydrogeology and water quality, such as: <ul style="list-style-type: none"> ○ minor or slight loss of soils or slight damage to geological structures/feature ○ minor or slight changes to the watercourse, hydrology or hydrodynamics ○ changes to site resulting in slight increase in runoff well within the drainage system capacity ○ minor changes to erosion and sedimentation patterns ○ minor changes to the water chemistry of surface runoff and groundwater ○ minor changes to groundwater levels, flow regime and risk of groundwater flooding.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect the use / integrity	<ul style="list-style-type: none"> • No perceptible changes to the baseline soils, geology, hydrology, hydrogeology and water quality such as: <ul style="list-style-type: none"> ○ no alteration or very minor changes with no impact to watercourses, hydrology, hydrodynamics, erosion and sedimentation patterns ○ no pollution or change in water chemistry to either groundwater or surface water ○ no alteration to groundwater recharge or flow mechanisms

Significance of Likely Effect

The sensitivity of the receiving environment together with the magnitude of the impact determines the significance of the effect, which can be categorised into level of significance as identified in Table 9-3. This will also consider good practice measures implemented and embedded as part of the design and construction of the Proposed Development and use of professional judgement where appropriate.

The table provides a guide to assist in decision making. However, it is not a substitute for professional judgment and interpretation. In some cases, the potential sensitivity of the receiving environment or the

magnitude of potential impact cannot be quantified with certainty and, therefore, professional judgement remains the most robust method for identifying the predicted significance of a potential effect.

Table 9-3: Significance of Likely Effect

Magnitude of Impact / Change	Sensitivity of Receptor			
	High	Moderate	Low	Not Sensitive
Major	Major	Major	Moderate	Negligible
Medium	Moderate	Moderate	Minor	Negligible
Minor	Moderate	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Effects of 'Major' or 'Moderate' significance are considered to be 'significant' in terms of the EIA Regulations.

This approach provides a mechanism for identifying the areas where mitigation measures are required, and for identifying mitigation measures appropriate to the risk presented by the Proposed Development. This approach also allows effort to be focused on reducing risk where the greatest benefit may result.

The sensitivity of the receiving environment (i.e. the baseline quality of the receiving environment as well as its ability to absorb the effect without perceptible change) and the magnitude of impacts will each be considered through a set of pre-defined criteria.

The sensitivity of the receiving environment together with the magnitude of the effect defines the significance of the effect, which will be categorised into the level of significance.

A review of other existing and proposed developments near the Proposed Development will be undertaken and potential impacts on hydrology, hydrogeology and geology will be assessed to identify cumulative impacts. With regard to the Proposed Development, it is likely that mitigation measures will be proposed that will have a neutral effect or provide betterment compared to baseline conditions. It is considered unlikely that there will be any significant residual or cumulative impact to report.

9.3.4 Peat Management Plan and Peat Landslide Hazard Risk Assessment

To validate the previous peat probing data and to further assess the distribution and depth of peat at site a programme of an additional Phase I peat depth programme will be undertaken to inform the emerging site design and impact assessment as required by current best practice. An indicative proposed peat probing plan is provided in **Figure 9.2**. As part of the programme of field work the following will be undertaken:

- a geomorphological mapping exercise to link the topographic features with the underlying geology and to visit those areas of the site that may be identified as potentially 'at risk from peat slide';
- the thickness of the peat will be established by probing and the underlying sub-strata confirmed by inspections of watercourses; and
- signs of existing or potential peat instability will be recorded.

If required, further, or Phase II peat depth probing, will be undertaken as part of the site design in accordance with best practice and will include peat probing along the infrastructure at 50 m centres and at 10 m interval crosshair at electrical infrastructure locations (turbines, substation).

Output from the field surveys will comprise a record of investigation locations and summary of peat depths recorded.

Based on the review of historical data and a review of the Proposed Development layout a Peat Landslide Hazard and Risk Assessment (PLHRA) may be required for the Proposed Development. The

PLHRA would be completed using all site survey data and slope analysis (using DTM data), highlighting areas that may be impacted by a peat slide so that appropriate mitigation measures can be identified. The peat survey data would be used to show how the Proposed Development meets the requirements of the mitigation hierarchy approach for carbon rich soils and peat as set out in NPF4 Policy 5.

9.3.5 Borrow Pit Assessment

A review of suitability of materials on the site will be undertaken and borrow pit search areas will be identified as part of the Borrow Pit Assessment. If appropriate areas are identified a description of likely materials, borrow pit size and the ability to supply appropriate materials for the construction of the wind farm will be included.

9.3.6 Water Quality Appraisal

The assessment will consider the quality and quantity of any effluent produced by the plant and how this will be managed. The assessment will be completed using published data sources and desk based hydrological techniques to estimate the likely variation in surface water flows. Published data sources will be used to assess potential water quality. It is recognised that water monitoring may be required, at a later date, in support of any Controlled Activity Regulation authorisation which may be required.

9.3.7 Mitigation

The Proposed Development will undergo design iterations and evolution in response to constraints identified as part of the baseline studies and field studies so as to avoid and/or minimise potential effects on receptors where possible.

For example, it is expected that the following potential mitigation measures will be included in the design of the Proposed Development:

- a buffer of 50m will be applied to watercourses where possible (and would only be reduced where other constraints mean this is not possible – in such instances justification would be provided in the EIA Report and additional mitigation measures to safeguard the water environment would be specified);
- site specific peat probing will be used to identify areas of potential deep peat and these will be avoided where practical;
- a site-specific peat landslide and hazard risk assessment will be prepared and areas of potential increased peat slide risk will be avoided;
- if required, a peat management plan will be prepared to show how the integrity of peat will be safeguarded; and
- impacts on private water supply sources and areas of GWDTE will be avoided.

There is much best practice guidance available to assist developers minimise the risks associated with wind farm construction and operation, and this will be used to develop site specific mitigation measures. Measures will be proposed to control and mitigate, for example, pollution risk (from anthropogenic and geogenic sources), flood risk, watercourse crossings, impacts on surface and groundwater flow paths, and management of peat soils.

Good practice measures will be applied in relation to pollution risk, and management of surface run-off rates and volumes. This will form part of the final Construction and Environmental Management Plan (CEMP) to be implemented for the Proposed Development.

9.4 Consultation

Consultation and data requests will be conducted with the following bodies:

- The Highland Council;
- SEPA;
- NatureScot;
- Scottish Water;
- Cromarty Firth District Salmon Fisheries Board; and

- Cromarty Firth Fisheries Trust.

It is expected as the site design develops consultation will be undertaken with SEPA and the results of peat probing and habitat mapping shared in order that their comments and advice can be incorporated in the site design.

9.5 Matters Scoped Out

At this stage, it is proposed that the following can be scoped out of detailed assessment:

- Effects on bedrock geology. While there will be effects arising from rock extraction for borrow pits, track construction and for turbine and crane pad areas, these are limited in area and do not extend beyond the immediate development footprint. No particularly sensitive geological features have been identified within the study area.
- Detailed Flood Risk Assessment. Published mapping confirms that the site is not located in an area of fluvial or coastal flood risk. It is proposed, therefore, that a simple screening of potential flooding sources (fluvial, coastal, groundwater, infrastructure etc.) is presented in the EIA Report and measures that would be used to control the rate and quality of runoff will be specified in the EIA Report.
- Water level or flow and water quality monitoring as this would be undertaken prior to any construction occurring at site in order to establish a baseline monitoring record and would be undertaken as part of the detailed design stage of the Proposed Development (and would be used to support a Controlled Activity Regulations authorisation application for the construction stage of the project).

9.6 Questions to Consultees

- Q9.1 Published mapping confirms that most of the Site area is not identified as being at flood risk. It is proposed, therefore, that a simple screening of potential flooding sources (fluvial, coastal, pluvial, groundwater etc.) is presented in the EIA Report. Is this approach acceptable?
- Q9.2 It is not proposed to prepare a detailed drainage design. Rather measures that would be used to control the rate and quality of runoff will be specified in the EIA Report. Again, is this acceptable?
- Q9.3 Site investigations, including detailed peat probing and private water survey, will be undertaken as part of the proposed assessment. Should any additional investigation or data sources be considered when assessing baseline conditions?
- Q9.4 It is not proposed to undertake any water quality sampling, establish groundwater monitoring points, surface water monitoring points or undertake leachability trials of any rock as there is published data that can be used to characterise baseline conditions and complete the impact assessment. Is this acceptable?
- Q9.5 Please advise if there is any specific information or methodology that should be used / followed as part of the Private Water Supply risk assessment?
- Q9.6 Do you agree that the scope of the proposed assessment is appropriate?

9.7 References and Standard Guidance

The geology, hydrology and soil chapter will be prepared with reference to best practice guidance and legislation, including (but not limited to):

Legislation:

- EC Water Framework Directive (2000/60/EC)
- Water Environment and Water Services (Scotland) Act 2003
- Water Environment (Controlled Activities) Regulations 2011
- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017

Policy:

- National Planning Framework 4 (NPF4)
- Highland-wide Local Development Plan

Guidance:

- Good Practice during Windfarm Construction, 4th Edition (Scottish Renewables, Scottish Natural Heritage (now NatureScot), Scottish Environment Protection Agency, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland Science and AEECoW, 2019)
- Land Use Planning System – SEPA Guidance Note 31 (Guidance on Assessing Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems), Version 3, (SEPA, 2017)
- Control of Water Pollution from Linear Construction Projects – Technical Guidance, C648 (CIRIA, 2006)
- The SuDS Manual C753 (CIRIA, 2015)
- Environmental Good Practice on Site C741 (CIRIA, 2015)
- Developments on Peat and Offsite Uses of Waste Peat (Scottish Environment Protection Agency, 2017)
- Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Scottish Government, 2017)
- Developments on Peatland - Guidance on the assessment of peat volumes, re-use of excavated peat and the minimisation of waste (Scottish Renewables and SEPA, 2012)
- Peatland Survey – Guidance on Development on Peatland (Scottish Government, Scottish Natural Heritage (now NatureScot) and SEPA, 2017)
- Floating Roads on Peat - Report into Good Practice in Design, Construction and Use of Floating Roads on Peat with particular reference to Wind Farm Developments in Scotland (Forestry Commission Scotland and Scottish Natural Heritage, 2010)
- Managing Geotechnical Risk: Improving Productivity in UK Building and Construction (Institution of Civil Engineers, 2001)
- Ground Engineering Spoil: Good Management Practice CIRIA Report 179 (CIRIA, 1997)
- Scottish Roads Network Landslides Study Summary Report (Scottish Executive, 2005); and
- Guidelines for the Risk Management of Peat Slips on the Construction of Low Volume/Low Cost Roads on Peat (Forestry Commission, 2006).

10. Archaeology and Cultural Heritage

10.1 Introduction

This section of the report has been written by Beth Gray (MA hons in Archaeology), who has several years experience in the energy sector and compiling Cultural Heritage chapters within Environmental Impact Assessments.

The 'cultural heritage' of an area comprises archaeological sites, historic buildings, Inventoried Gardens and Designed Landscapes (GDLs), Inventoried Battlefields and other historic environment features. Alongside its inherent values, the 'setting' of an asset may also contribute to its cultural heritage significance.

The cultural heritage impact assessment will: identify cultural heritage assets that may be subject to significant effects, both within the limits of the Proposed Development and within a surrounding radius of 10km; establish the potential for currently unknown archaeological assets to survive buried within the site; assess the predicted effects on these assets; and propose a programme of mitigation where appropriate. It will consider direct effects (such as physical disturbance), indirect effects (such as might result from change to setting), and cumulative effects (where assets affected by the Proposed Development are also likely to be affected by other unrelated development proposals).

The proposed approach to the assessment of effects on cultural heritage is set out below. The assessment would be undertaken by SLR Consulting Ltd.

10.2 Environmental Baseline and Potential Sources of Impact

10.2.1 Within the Site Boundary

Within the site, potential direct impacts would be considered. There are no known cultural heritage assets within the site as recorded on Pastmap. Pastmap is a publicly available database of cultural heritage assets curated by Historic Environment Scotland (HES), which was consulted for scoping purposes. A targeted walk over survey would be conducted as part of the Environmental Impact Assessment (EIA) to ascertain the potential for direct impacts upon currently unknown assets. Historic Environment Data (HER Data) would also be purchased as part of the EIA to have the most up to date data to input into the assessment.

10.2.2 Outwith the Site Boundary

A high-level heritage appraisal has been carried out, informed by a Zone of Theoretical Visibility (ZTV), in relation to all nationally significant designated heritage assets within 10km of the proposed turbine locations. The designated heritage assets within 10km of the proposed turbine locations are listed within Appendix 10.1. All designated heritage assets within 10km are depicted on Figure 10.1.

Category B Listed Buildings within 5km of the proposed turbines have been scoped out of any further assessment, with the exception of those for which specific views are considered to contribute to their significance and/or to the ability to understand, appreciate and experience them. All Category B Listed Buildings outwith 5km of the proposed turbines have been scoped out of any further assessment.

There are no Conservation Areas within 5km of the proposed turbine locations, and Conservation Areas have therefore been scoped out of further assessment.

There are no Inventoried Battlefields or World Heritage Sites within 10km of the Proposed Development.

Whilst no significant effect is anticipated on any cultural heritage assets, due to their significance and degree of visibility with the Proposed Development, the following assets have been scoped in for further assessment:

- Heights of Brae Chambered Cairn (SM2312);
- Knock Farril Fort (SM1672);
- Clachan Corrach Chambered Cairn (SM2466);

- Henge, 135m SW of Fiodh Mhor (SM13745); and
- Fairburn Inventoried Garden and Designed Landscape (GDL00174) and Fairburn Tower (LB14030).

10.3 Method of Assessment and Reporting

10.3.1 Study Area

There is no guidance from HES which defines a required study area for the archaeological and cultural heritage assessment of wind farms.

For purposes of this assessment, and as set out above, a 10km-Study Area has been defined extending from the proposed turbines. All nationally significant designated assets within this Study Area have been subject to an initial setting appraisal in order to determine any potential for indirect impacts resulting from the proposed wind farm (Appendix 10.2).

Should the Highland Council Historic Environment Team (THCHET) identify any non-designated assets that it considers to be of national/regional significance, and which it considers to derive cultural heritage significance from their setting, these should be made known to the Applicant via consultation.

Any non-designated assets within the site will be assessed for direct impacts.

10.3.2 Consultation

Based on the results of the baseline study, constraint mapping will be generated using GIS software to show mapped heritage assets in relation to a Zone of Theoretical Visibility (ZTV) and, where necessary, historic mapping. This will help determine which assets do not require further assessment, due to a lack of any meaningful visual, historic functional or spatial association with the site, and will be used to identify and agree the most potentially sensitive assets; these may then require computer-generated visualisations as part of their assessment, in liaison with consultees.

Consultation will be undertaken with HES with respect to the method of assessment employed and those heritage assets within their remit, including: Scheduled Monuments, Category A Listed Buildings; Inventoried Gardens and Designed Landscapes (GDLs); and Inventoried Battlefields. THCHET will be consulted for designated heritage assets of regional and local significance, and any undesignated assets it considers to be of higher significance.

10.3.3 Field Surveys

A targeted site inspection will be carried out in relation to those recorded assets likely to be impacted by the Proposed Development, and the readily accessible elements of the proposed infrastructure; the aim of this would be to establish the condition of any recorded assets and identify the potential for the existence of additional assets not currently recorded.

Asset mapping would also be compared with ZTV, historic mapping, and satellite imagery in order to identify designated heritage assets for which the Proposed Development might cause indirect impacts in relation to setting. This would be followed by a detailed analysis of those sites identified as potentially sensitive to such impacts, including a targeted field inspection.

10.3.4 Assessment of Impact

The Proposed Development has the potential to result in impacts upon the significance of heritage assets where it changes their baseline condition and/or their setting.

In accordance with the EIA Regulations, this assessment will identify any development effects as either direct or indirect, adverse or beneficial, and short-term, long-term or permanent.

Assessment will be undertaken separately for direct impact and indirect impact. Direct impacts are those which would change the heritage significance of an asset through physical alteration; indirect impacts are those which would affect the heritage significance of an asset by causing change within its setting.

Direct impacts upon the significance of heritage assets will take into account the level of their heritage significance (where known) and the magnitude (extent) of the identified impacts.

Indirect impacts on the significance of heritage assets will be identified and assessed with reference to Managing Change in the Historic Environment: Setting (HES 2020) and the guidance set out by NatureScot and HES (2019). Assessment will be carried out in the following stages:

- initial consideration of intervisibility and other factors leading to the identification of potentially affected assets;
- assessment of the cultural heritage significance of potentially affected assets;
- assessment of the contribution of setting to the cultural heritage significance of those assets;
- assessment of the extent to which change to any contributing aspects of the settings of those assets, as a result of the Proposed Development, would affect their cultural heritage significance (magnitude of impact); and
- determination of the significance of any identified effects.

The settings assessment will be assisted by a ZTV calculation, as presented in Figure 10.1. The ZTV calculation will map the predicted degree of visibility of the Proposed Development from all points within a proportionate, defined study area around the site, as would be seen from an average observer's eye level (two metres above ground level). The ZTV model presented in Figure 10.1 is based on the maximum height of the blade tips of the Proposed Development.

10.3.5 Cultural Heritage Significance

HEPS (2019) defines Cultural Heritage Significance as a cultural heritage asset which has aesthetic, historic, scientific or social value for past, present or future generations. Cultural significance can be embodied in a place itself, its fabric, setting, use, associations, meanings, records, related places and related objects

The categories of cultural heritage significance to be referred to are presented in Table 10.1, which will act as an aid to consistency in the exercise of professional judgement and provide a degree of transparency for others in evaluating the conclusions drawn.

The significance categories have been defined with regard to factors such as: designation, status and grading. For undesignated assets, consideration will be given to their inherent heritage interests, intrinsic, contextual, and associative characteristics as defined in Annex 1 of HEPS (2019b). In relation to these assets, this assessment will focus upon an assessment of the assets' inherent capability to contribute to our understanding of the past; the character of their structural, decorative and field characteristics as determined from the HER and Canmore records and / or site visits; the contribution of an asset to an understanding of their class of monument, or the diminution of that class should an asset be lost; how a site relates to people, practices, events, and/or historical or social movements. Assessments of the significance of specific assets, where recorded within the HER, will be taken into account where appropriate.

Table 10-1: Cultural Heritage Sensitivity

Cultural Heritage significance	Explanation
Highest	Sites of international importance, including: <ul style="list-style-type: none"> • World Heritage Sites
High	Site of National importance, including: <ul style="list-style-type: none"> • Scheduled Monuments • Category A Listed Buildings • Gardens and Designed Landscapes included on the national inventory • Designated Battlefields

Cultural Heritage significance	Explanation
	<ul style="list-style-type: none"> Non-designated assets of equivalent significance
Medium	Sites of Regional/local importance, including: <ul style="list-style-type: none"> Category B and C Listed Buildings Conservation Areas highlighted as of equivalent significance Non-designated assets of equivalent significance.
Low	Sites of minor importance or with little of the asset remaining to justify a higher importance
None	Sites that are of no heritage significance
Unknown	Further information is required to assess the significance of these assets

10.3.6 Magnitude of Impact

Determining the magnitude of any likely impacts will include consideration of the nature of the activities proposed during the construction and operational phases of the Proposed Development.

Changes could potentially include direct change (e.g., ground disturbance), and indirect change (e.g., change to setting); this latter might include visual change, as well as noise, vibration, smell, dust, traffic movements etc. Effects may be beneficial or adverse, and may be short term, long term or permanent. The magnitude of any effects will be assessed using professional judgment, with reference to the criteria set out in Table 10.2.

Table 10-2: Magnitude of Impact

Magnitude of impact	Explanatory criteria
High Beneficial	The Proposed Development would considerably enhance the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Medium Beneficial	The Proposed Development would enhance, to a clearly discernible extent, the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Low Beneficial	The Proposed Development would enhance, to a minor extent, the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Very Low Beneficial	The Proposed Development would enhance, to a very minor extent, the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Neutral/None	The Proposed Development would not affect (or would have harmful and enhancing effects of equal magnitude upon) the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it.
Very Low Adverse	The Proposed Development would erode, to a very minor extent, the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it. This level of indirect effect would not be considered to affect the integrity of the asset's setting.
Low Adverse	The Proposed Development would erode, to a minor extent, the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it. This level of indirect effect would rarely be considered to affect the integrity of the asset's setting.
Medium Adverse	The Proposed Development would erode, to a clearly discernible extent, the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it. This level of indirect effect might be considered to affect the integrity of the asset's setting.

Magnitude of impact	Explanatory criteria
High Adverse	The Proposed Development would considerably erode the cultural heritage significance of the affected asset, or the ability to understand, appreciate and experience it. This level of indirect effect would probably be considered to affect the integrity of the asset's setting.

10.3.7 Level of Impact

The categories of Impact referred to, and the criteria used in their determination, are presented in Table 10.3.

Table 10-3: Level of Impact

Impact	Criteria
Major	Severe harm or enhancement, such as total loss of significance of the asset or of the integrity of its setting, or exceptional improvement of the cultural heritage significance of the asset and/or the ability to understand, appreciate and experience it.
Moderate	Harm or enhancement, such as the introduction or removal of an element that would affect the cultural heritage significance of the asset and the ability to understand, appreciate and experience it to a clearly discernible extent.
Minor	Harm or enhancement to the asset's cultural heritage significance and/or to the ability to understand, appreciate and experience it to a modest extent, such that the majority of the asset's inherent interests and aspects of setting would be preserved.
Very Minor	Harm or enhancement to the asset's cultural heritage significance and/or to the ability to understand, appreciate and experience it, that is barely discernible.
Nil	The development would not affect the cultural heritage significance of the asset and/or the ability to understand, appreciate and experience it, or would have harmful and enhancing effects of equal magnitude.

Table 10-4: Level of Effect Matrix

Magnitude of Impact	Cultural Heritage Significance (excluding unknown)			
	Highest	High	Medium	Low
High beneficial	Major	Major	Moderate	Minor
Medium beneficial	Major	Moderate	Minor	Very Minor
Low beneficial	Moderate	Minor	Very Minor	Very Minor
Very low beneficial	Minor	Very Minor	Negligible	Negligible
Neutral/None	Neutral/Nil	Neutral/Nil	Neutral/Nil	Neutral/Nil
Very low adverse	Minor	Very Minor	Negligible	Negligible
Low adverse	Moderate	Minor	Very Minor	Very Minor
Medium adverse	Major	Moderate	Minor	Very Minor
High adverse	Major	Major	Moderate	Minor

10.3.8 Mitigation

Where adverse effects on cultural heritage assets are identified, measures to prevent, reduce and/or, where necessary, offset these effects, will be proposed. Potential mitigation measures can be discussed in terms of Direct and Indirect impact.

Suitable measures for mitigating direct impacts might include:

- the micro-siting of Proposed Development infrastructure away from sensitive locations;
- the fencing off or marking out of heritage assets or features in proximity to construction activity in order avoid disturbance;
- a programme of archaeological work where required, such as an archaeological watching brief during construction activities in, or in proximity to, areas of archaeological sensitivity, or excavation and recording where impact is unavoidable; and
- a working protocol to be implemented should unrecorded archaeological features be discovered.

Suitable measures for mitigating any indirect impacts might include:

- alteration of the proposed turbine layout;
- reduction of proposed turbine heights; and
- changing the proposed colour of selected turbines.

10.3.9 Residual Impact

Residual impacts are those that remain even after the implementation of suitable mitigation measures. Residual impacts will be identified, and the level of those residual impacts defined with reference to Tables 10.3 and 10.4.

The significance of those residual impacts for purposes of EIA would then be defined as either 'Significant' or 'Not Significant'.

10.3.10 Cumulative Impact

A cumulative effect is considered to occur when there is a combination of:

- an impact on an asset or group of assets due to changes resulting from the development subject to assessment; and
- an impact on the same asset or group of assets resulting from another development (consented or proposed) within the surrounding landscape.

Consideration of the other developments will be limited to:

- wind farm planning applications that have been submitted and have a decision pending; and
- wind farm planning applications that have been granted permission but not yet constructed.

Any impact resulting from operational wind farms would be considered as part of the baseline impact assessment. Cumulative impact would be considered in two stages:

- assessment of the combined impact of the developments, including the proposed; and
- assessment of the extent to which the Proposed Development contributes to the combined impact.

10.3.11 Significance of Impact

Professional judgment will be used in the determination of whether any effects are 'Significant' or 'Not Significant' for purposes of EIA.

With reference to the matrix presented in Table 10.4, any impacts identified as 'Substantial' within the matrix would almost certainly be considered 'Significant', while any impacts identified as 'Moderate' within the matrix might be considered 'Significant'.

A clear statement will be made as to whether any identified impacts are 'Significant' or 'Not Significant' for purposes of EIA.

10.3.12 Matters Scoped Out

On the basis of the work undertaken to date, the professional judgement of the cultural heritage team, and experience of other comparable projects, it is considered that indirect and cumulative impacts of the Proposed Development on Conservation Areas, and on Category B and C Listed Buildings can be scoped out of the EIA in relation to cultural heritage. As per best practice guidance within NatureScot and HES (2019), Category C Listed Buildings are of local rather than national or regional importance, unless in the opinion of an assessor the designation should be higher.

It is also considered that any assets that fall outwith the ZTV (and where those assets' approaches also fall outwith the ZTV) can be scoped out of the EIA in relation to cultural heritage.

10.4 Questions for Consultees

- Q10.1 Do consultees agree with the methodology set out?
- Q10.2 Do consultees agree with assets and matters scoped out?
- Q10.3 Are there any assets, not listed in the appraisal, that key consideration should be given to?
- Q10.4 Do consultees have any specifications on visualisations and their locations?

10.5 References and Standard Guidance

10.5.1 Legislation

The assessment will be undertaken in accordance with the following principal relevant legislation:

- The Ancient Monuments and Archaeological Areas Act 1979
- The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997
- The Historic Environment (Amendment) (Scotland) Act 2011
- Scottish Statutory Instrument No. 101 The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017

10.5.2 Planning Policy

The Scottish Government and HES have issued a number of statements of policy with respect to dealing with the historic environment in the planning system:

- National Planning Framework 4 (NPF4 2023)
- Onshore Wind Turbines: Planning Advice (2014)
- Planning Advice Note 2/2011: Planning and Archaeology
- Our Place in Time (OPiT 2014)
- Historic Environment Policy for Scotland (HEPS 2019)
- Scottish Border Local Development Plan (2016)

10.5.3 Guidelines and Technical Standards

Relevant guidance and technical standard documents comprise:

- Historic Environment Scotland Guidance on Managing Change in the Historic Environment: Setting (2020)
- A Guide to Climate Change Impact: On Scotland's Historic Environment (2019)

- Scottish National Heritage and Historic Environment Scotland Environmental Impact Assessment Handbook: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment Process in Scotland (2019)
- Chartered Institute for Archaeologists Standard and Guidance for Historic Environment Desk Based Assessment (2014, updated 2017)

11. Noise and Vibration

11.1 Introduction

This section of the report has been written by Richard Carter (CEng, BEng(Hons), MIOA) who is a chartered acoustics engineer, with over 18 years' experience working in environmental acoustics, of which 13 years has been spent specialising in wind turbine noise. Richard is a member of the Institute of Acoustics.

11.2 Environmental Baseline and Potential Sources of Impact

This section considers the scope of work required to assess potential significant effects associated with noise and vibration during the construction and operational phases of the Proposed Development. The construction of the Proposed Development would introduce temporary noise sources in the form of plant and construction activities, along with the movement of vehicles. Noise would be generated during the construction of access tracks, excavation for turbine foundations, including any borrow pit blasting and as a result of the haulage of materials within the site.

With respect to operational noise, wind turbines generate noise by two means; mechanical noise from the gearbox and generator in the nacelle; and aerodynamic noise caused by the noise of wind passing over the turbine blades. Wind turbines are designed to minimise mechanical noise, for example noise sources in the nacelle are contained within insulated enclosures. Aerodynamic noise is minimised by the design of the turbine blades; however, some aerodynamic noise is unavoidable. Aerodynamic noise increases in proportion with the speed of the turbine blade; therefore, noise levels generally increase with wind speed.

The study area considers wind farms within an approximate radius of 10km and noise-sensitive receptors (NSRs) within a radius of approximately 3km from the Proposed Development. The exact study area will be determined by the final layout and defined as the area where the wind turbine noise from the Proposed Development is predicted to be within 10dB of other relevant wind energy developments, and the predicted cumulative wind farm noise level is greater than 35dB LA90.

A number of potential Noise Sensitive Receptors (NSRs) have been identified, as detailed in Table 11-1 and shown in Figure 11.1. This list is not intended to be exhaustive and NSRs may be added to or removed from the list subject to further assessment work. The NSRs identified have been selected to consider a worst case and one receptor may be used to represent several other, more distant, receptors in the vicinity.

Table 11-1 : Noise Sensitive Receptors

NSR ID	Name	Easting	Northing
NSR1	East Park	240059	864744
NSR2	Tigh Fiodha	240450	863836
NSR3	Tigh Na Drochit	239575	862888
NSR4	Colins Cottage	239900	862232
NSR5	Coach House	240307	861600
NSR6	Strathgrave Lodge	240511	861396

11.3 Method of Assessment and Reporting

The assessment will consider the potential effects of the Proposed Development due to noise associated with both the construction and operational phases, including consideration of the impact of construction traffic, as set out below.

11.3.1 Construction Noise

The assessment of temporary construction noise effects will include the calculation of noise levels from the anticipated plant and activities at the identified NSRs. Predictions of construction noise levels will be undertaken in accordance with British Standard BS5228-1:2009+A1:2014, Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise, (BS5228) using published source noise level data. The calculations will be undertaken in accordance with Annex F2.2, 'Method for Activity LAeq' and Annex F2.4, 'Method for Mobile Plant in a Defined Area'.

The predictions of construction noise levels will be assessed against appropriate threshold values to identify the significance of temporary construction noise effects. Guidance on noise limits during construction activities will be taken from BS5228.

The impact of traffic associated with the construction phase will be based on the result of the Site Access, Traffic and Transport Assessment (detailed in Chapter 12), where consideration will be given to the increase in traffic flows generated on the proposed transport route(s). This will be based on the baseline and predicted flows and assessed following the guidance detailed within the Design Manual for Roads and Bridges (DMRB). It may be possible that the total vehicle flows on some quieter roads are below the calculation threshold set out in the Calculation of Road Traffic Noise (CRTN). In such cases, noise from vehicles using these roads will be calculated using the Haul Route method set out in BS5228.

It is anticipated that some rock extraction from borrow pits by means of blasting operations may be required in some instances. The analysis of the related potential impacts will be made in accordance with Planning and Advice Note PAN50, BS6472 2:2008 'Guide to evaluation of human exposure to vibration in buildings - Part 2: Blast-induced vibration' and BS5228.

Decommissioning is likely to result in less noise than during construction of the Proposed Development and is therefore scoped out of the EIA. Decommissioning is likely to be addressed by a condition on the consent requiring a decommissioning plan to be submitted for approval towards the end of life of the Proposed Development.

The residual effects of construction noise and construction traffic will be undertaken in accordance with relevant good practice, policy and guidance.

11.3.2 Operational Noise

The assessment of operational noise impacts will be undertaken in accordance with ETSU-R-97, whilst also following the recommendations detailed within the Institute of Acoustics (IOA) Good Practice Guide (GPG), as endorsed by national planning guidance and specifically within THC's Onshore Wind Energy Supplementary Guidance (November 2016).

The acceptable limits for wind turbine operational noise are clearly defined in the ETSU-R-97 document and these limits should not be breached. Consequently, the test applied to operational noise is whether or not the calculated wind farm noise immission levels at nearby noise sensitive properties lie below the noise limits derived in accordance with ETSU-R-97. No guidance is available to determine the magnitude of any noise impact; therefore it is appropriate to classify impacts as not significant if the ETSU-R-97 noise limit is not exceeded and significant if it is.

ETSU-R-97 states that the assessment should take account of the effect of noise from all existing consented or, in some cases, proposed wind turbines that may affect a particular noise sensitive receptor. In addition, THC's specific requirements for wind farm operational noise assessments are outlined in Section 4 of their Supplementary Guidance document. It states (at paragraph 4.53) that "where noise from more than one wind turbine development may have a cumulative impact at any noise sensitive location, applicants must ensure this is adequately assessed in accordance with best practice, which includes consideration of both predicted and consented levels".

In this respect, cumulative noise will be the primary focus of the assessment and other turbines in the area will be included. Potential cumulative noise effects are typically restricted to turbines within 5km; as such, a 10km search ensures that all potential developments are identified and considered for inclusion where necessary. The assessment will be undertaken with reference to current best practice, noise predictions contained within the noise assessments of the individual applications and consented

limits presented in the planning permissions. As per the guidance of ETSU-R-97 and the IOA GPG, day-time and night-time noise limits will be applicable to all wind turbines operating cumulatively. Therefore, the assessment of cumulative noise will be a key consideration with respect to the Proposed Development in the context of the consented noise limits associated with the operation of the existing wind farms.

Noise limits will be determined following ETSU-R-97 and the IOA GPG. At this stage it is considered likely that the noise limit for the Proposed Development will be based on a fixed 35 dB LA90 for all wind speeds and times of the day. In such a case a baseline noise survey would not be carried out. The only exception to a limit of 35 dB LA90 would be any properties that are financially involved with the Proposed Development, or a neighbouring wind farm, in which case a limit of 45 dB LA90 will be applied. In the case of a property that is financially involved with a neighbouring wind farm, but not the Proposed Development, the increased limit of 45 dB LA90 would only apply in the cumulative assessment. If, during the design process, a higher noise limit is considered to be more appropriate, then further consultation with THC will be carried out and baseline noise surveys would be proposed at representative locations in accordance with ETSU-R-97 and the IOA GPG.

The operational noise assessment will also consider the impact of the Proposed Development in isolation of other wind energy developments in the area. Noise limits for the Proposed Development will be derived based on the ETSU-R-97 noise limits less the portion of which already utilised by these other developments.

11.4 Consultation

No consultation has been carried out to date regarding the noise assessment for the Proposed Development. As part of the assessment, the Environmental Health Department of THC will be consulted to agree the approach to the assessment and confirm the wind farms that are within 10km of the site and in planning.

11.5 Matters Scoped Out

11.5.1 Low Frequency Noise and Infrasound

A study, published in 2006 by acoustic consultants Hayes McKenzie on the behalf of the Department of Trade and Industry (DTI), investigated low frequency noise from wind farms (Hayes McKenzie, 2006). 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 possibly due to a phenomenon known as Amplitude Modulation (AM).

Further, in February 2013, the Environmental Protection Authority of South Australia published the results of a study into infrasound levels near wind farms (Environment Protection Authority, 2013). 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) 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."

It is therefore not considered necessary to carry out a specific assessment of infrasound and low-frequency noise.

11.5.2 Amplitude Modulation

A study was carried out 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 (University of Salford, 2007). This report defined AM as aerodynamic noise from wind turbines with a greater degree of fluctuation than normal at blade passing frequency (occasionally referred to elsewhere as 'other AM' (OAM)). Its aims were to

ascertain the prevalence of AM 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 AM has occurred at only a small number of wind farms in the UK (4 of 133), and only for between 7% and 15% of the time. It also states that, at the time of writing, the causes of AM were not well understood, and that prediction of the effect was not currently possible.

This research was updated in 2013 by an in-depth study undertaken by RenewableUK, which identified that many of the previously suggested causes of AM have little or no association to the occurrence of AM in practice (RenewableUK, 2013). The generation of AM is based upon the interaction of several factors, the combination and contributions of which are unique to each site. With the current knowledge, it is not possible to predict whether any particular site is more or less likely to give rise to AM, and the incidence of AM occurring at any particular site remains low, as identified in the University of Salford study.

In 2016, the IOA proposed a measurement technique to quantify the level of AM present in any particular sample of wind farm noise (Institute of Acoustics, 2016). This technique is supported by the Department of Business, Energy & Industrial Strategy (BEIS, formerly the Department of Energy & Climate Change) who have published guidance, 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 (BEIS, 2016).

Section 7.2.1 of the IOA 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".

It is therefore not considered necessary to carry out a specific assessment of AM.

11.5.3 Construction and Operational Vibration

Research undertaken by D. J. Snow found that levels of ground-borne vibration 100m from an operational wind turbine were significantly below criteria for 'critical working areas' given by British Standard BS 6472:1992 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 (Snow, 1997).

Ground-borne vibration from operational wind turbines can be detected using sophisticated instruments several kilometres (km) from a wind farm site, as reported by Keele University (Keele University, 2005). This report clearly shows that, although detectable using highly sensitive instruments, the magnitude of the operational vibration is orders of magnitude below the human level of perception and does not pose any risk to human health.

The nature of works and distances involved in the construction of a wind farm are such that the risk of significant effects relating to ground-borne construction vibration are very low. Notwithstanding this, in the event that stone is required to be extracted from borrow pits by blasting, such effects will be recommended to be managed through a Scheme of Blasting.

Extensive research has been carried out on the subject of traffic-induced vibration impacting a range of buildings of various ages and types, and no evidence has been found that this is a source of significant damage to buildings (Watts, 1990).

It is therefore not considered necessary to carry out a specific assessment of vibration.

11.5.4 Operational Road Traffic Noise

The number of vehicles required to access the site during the operation of a wind farm are very low and infrequent. Therefore, no likely significant effects are anticipated in the context of the existing road network and as such an assessment of road traffic noise impacts during operation is scoped out.

11.6 Questions for Consultees

- Q11.1 Are there any specific wind energy developments that are to be included in the assessment?
- Q11.2 Is there any other local guidance relevant to wind turbine noise assessment that we have not discussed above?
- Q11.3 Do consultees agree with the methodology set out?

11.7 References and Standard Guidance

The assessment will draw on the following guidance documents:

- National Planning Policy 4 (Scottish Government, 2023)
- Planning Advice Note 1/2011 (Scottish Government, 2011)
- Onshore Wind Turbines Scottish Government Planning Advice (Scottish Government, 2014)
- Onshore Wind Energy Supplementary Guidance (The Highland Council, 2017)
- ETSU-R-97 the Assessment and Rating of Noise from Wind Farms (The Working Group on Noise from Wind Turbines, 1997)
- A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (Institute of Acoustics, 2013)
- ISO 9613-2 Attenuation of Sound during Propagation Outdoors: Part 2 (International Standards Organisation, 1996)
- BS 5228-1 Code of Practice for Noise and Vibration Control of Construction and Open Sites – Part 1: Noise (BSI, 2014)

References

- BS 5228-1:2009-A:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise', BSI 2014
- Design Manual for Roads and Bridges, Volume 11, section 3, Part 7, Traffic Noise and Vibration, Transport Scotland 2011
- Calculation of Road Traffic Noise, HMSO Department of Transport, 1988
- BS 6472 2:2008:Guide to evaluation of human exposure to vibration in buildings - Part 2: Blast-induced vibration, BSI 2008
- ETSU-R-97, the Assessment and Rating of Noise from Wind Farms, Final ETSU-R-97 Report for the Department of Trade & Industry. The Working Group on Noise from Wind Turbines, 1997
- A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise, M. Cand, R. Davis, C. Jordan, M. Hayes, R. Perkins, Institute of Acoustics, May 2013
- Onshore Wind Energy Supplementary Guidance, The Highland Council, December 2017
- 'The measurement of low frequency noise at three UK wind farms', M. Hayes, DTI Report W/45/00656/00, 2006
- Infrasound Levels Near Windfarms and in other Environments, Environmental Protection Authority Australia, 2013
- 'Research into Aerodynamic Modulation of Wind Turbine Noise', Report by University of Salford, URN 07/1235 (July 2007)
- Wind Turbine Amplitude Modulation: Research to Improve Understanding as to its Cause and Effect, Renewable UK, December 2013
- Institute of Acoustics (IOA) Amplitude Modulation Working Group, Final Report, A Method for Rating Amplitude Modulation in Wind Turbine Noise, June 2016
- Review of the evidence on the response to amplitude modulation from wind turbines, WSP for Department for Business, Energy & Industrial Strategy. 2016

<https://www.gov.uk/government/publications/review-of-the-evidence-on-the-response-to-amplitude-modulation-from-wind-turbines>

- 'Low frequency noise and vibration measurements at a modern wind farm', D. Snow, ETSU Report ETSU W/13/00392/REP, 1997
- Microseismic and Infrasound Monitoring of Low Frequency Noise and Vibrations from Windfarms, Keele University 2005
- Traffic Induced Vibrations in Building – Research Report 246, Transport and Road Research Laboratory, Watts 1990
- National Planning Framework 4 (NPF4), The Scottish Government 2023
<https://www.gov.scot/publications/national-planning-framework-4/>
- Planning Advice Note 1/2011: Planning and Noise, The Scottish Government 2011
<https://www.gov.scot/publications/planning-advice-note-1-2011-planning-noise/>
- Onshore Wind Turbines: Planning Advice, The Scottish Government 2014
<https://www.gov.scot/publications/onshore-wind-turbines-planning-advice/>
- ISO 9613-2, Acoustics – Attenuation of Sound during Propagation Outdoors: Part 2 – General Method of Calculation, International Standards Organization 1996

12. Site Access, Traffic and Transport

12.1 Introduction

This section considers the scope of work required to assess the potential significant effects associated with access, traffic and transport during the construction and operational phases of the Proposed Development.

The access route for abnormal loads has been considered in the Route Survey Report prepared by Pell Frischmann, dated June 2021. The report was prepared to identify the potential issues associated with the transport of abnormal indivisible loads (AILs), identifying specific locations of concern and highlighting any remedial works required to facilitate AIL delivery. The route from the Port of Invergordon is assessed, to include the B817, the A9 and the A835.

The report concludes that access to the wind farm is considered feasible, with various road modifications and interventions. This report will be referenced in the preparation of the Chapter and will be used to inform the assessment.

This section of the report has been written by Joanna Read. Joanna has 20 years' experience in the field of transport planning and has contributed to the process of Environmental Impact Assessment for a number and range of projects. Joanna is a member of the Chartered Institute of Highways and Transportation (CIHT) and she holds a Master of Science degree in Transportation Planning and Engineering from Southampton University.

12.2 Environmental Baseline and Potential Sources of Impact

12.2.1 Scope of Study and Study Area

An assessment is required to evaluate the effects of the Proposed Development and to determine the scale of the impacts on the identified sensitive receptors. From a desktop study of the site access and the posed likely delivery route, the main receptors, sensitive to increased traffic levels, are anticipated to be located along the A835 where there are a number of small communities, such as Contin and Garve. These communities include residential properties and non-residential properties such as public houses, businesses (café, hotels, village shops) and churches. There are also several individually placed dwellings, away from the villages, as well as farms along the delivery route.

It is anticipated that the largest items to be delivered to site would be the wind turbine components (WTC), along with any substation elements. A route survey report (RSR) has been prepared by Pell Frischmann and the findings from this will be referenced within the EIA Report. The EIA report will also consider the impacts associated with the transport of all other construction materials, structures and plant required during construction for each element of the Proposed Development.

It is anticipated that the traffic and transport assessment study area will focus on the A835 from the junction with the A9 to the site access. The route for abnormal loads will consist of the B817 from Port of Invergordon to the A9/ Academy Road Priority junction just east of Achnagarron, and the A9 from the A9/ Academy Road junction to the Tore Roundabout, and along the A835 to make a turn at Inchbae Lodge. Abnormal loads will then head back along the A835 to the start of the new site access track at Black Water Falls northeast of Garve. The assessment will focus on the delivery of construction materials, and it is anticipated that any further assessment of the route for Abnormal Indivisible Loads (AILs) will be completed separately, with the findings presented within the EIA Report Traffic and Transport Chapter.

12.2.2 Baseline Conditions including Field Studies

The Access, Traffic and Transport chapter of the EIA Report will include a detailed evaluation of the baseline conditions and will focus on assessing the potential impacts to arise during the construction phase and for each element of the Proposed Development.

This will include an abridged construction works programme, details of vehicle types and sizes to be used during the construction phase, and an estimate of the number of trips anticipated to be generated

by Heavy Goods Vehicles (HGVs), Light Goods Vehicles (LGVs) and light vehicles. Mitigation measures to alleviate the known local traffic issues arising from the construction traffic will be identified, with the aim of reducing the effect of the vehicle movements identified.

The following data collection and analysis will be undertaken:

- a review of available nearby development application documents;
- a review of the Route Survey Report;
- analysis of traffic count data and accident data;
- identification of likely sensitive receptors within the study area;
- assessment of traffic impacts of previous and committed local developments to understand identified effects;
- compilation of data on the number of construction vehicles and staff numbers related to each phase of the construction likely to be present on the local road network during the construction phase; and
- a review of height and weight restrictions along the proposed construction transport routes.

Field Surveys

A search on the Department for Transport (DfT) website has confirmed that there is a traffic counter on the A835 (No 30800) to the south of Loch Garve, with automatic counter data available for 2019 and estimated data for 2021.

Traffic surveys will be commissioned to provide a baseline situation for traffic flows, movements and speeds. An Automatic Traffic Counter (ATC) would be placed close to the proposed site access with a second ATC placed on the A835 in an appropriate location; this would be commissioned to collect data for 24 hours a day across a seven-day continuous period. All traffic data collected will provide classified and directional traffic flow data. Speeds would also be recorded at the ATC site in order to determine the 85th percentile speeds and would be used to determine whether the access junction with the A835 has sufficient visibility splays.

Should a traffic count be unable/unacceptable for commissioning, the Roads Authority and Transport Scotland would be further consulted for existing traffic data along the delivery route.

Desk study

The following data collection and analysis will be undertaken:

- a review of available nearby wind farm development application documents, including all work undertaken previously for the site;
- a review of the RSR and any updates;
- obtain and review five years of injury accident data for the study area;
- analysis of traffic count data;
- assessment of traffic impacts of previous and committed local wind farm developments to understand identified effects;
- compilation of data on the number of construction vehicles and staff numbers likely to be present on the local road network during the construction phase;
- review anticipated construction programme (once available); and
- a review of height and weight restrictions along the proposed construction transport routes.

12.2.3 Potential Sources of Impact

The potential sources of impact have been divided into two development phases: construction and operation. In summary, the main potential sources of impact are likely to relate to the impact of construction traffic on the residential areas along the network route.

The construction phase of the Proposed Development is likely to create the greatest environmental impacts. This is due to the number of HGVs LGVs required to transport the materials onsite; as such there would be traffic impacts associated with the communities and roads along the delivery routes.

Once the Proposed Development is operational, the wind farm would have negligible traffic/transport related impacts caused by intermittent maintenance vehicles travelling to the site.

Mitigation measures will be proposed following the completion of the impact assessments, as informed by the baseline. The purpose of these measures is to aim to remove, minimise, or compensate any significant effects. These mitigation measures will be agreed with the Council(s) and Transport Scotland.

12.3 Method of Assessment and Reporting

The access, traffic and transport chapter of the EIA Report will include a detailed evaluation of the baseline conditions and will focus on assessing the potential impacts to arise during the construction phase. This will include an abridged construction works programme, details of vehicle types and sizes to be used during the construction phase, and an estimate of the number of trips anticipated to be generated by HGVs, LGVs and light vehicles. Specifically the assessment will include the following:

- a review of the construction programme to confirm the key traffic generating activities;
- compilation of data on the number of daily vehicle trips to be present on the roads within the study area, and identification of the likely maximum or worst case scenario;
- an assessment of the possible impacts associated with the transport of abnormal loads;
- a comparison between likely traffic flows on potentially affected roads against the baseline situation for a future year scenario with and without the Proposed Development, reported as percentage increases; and
- identification of the impacts.

Mitigation measures to alleviate the known local traffic issues arising from the wind farm construction traffic will be identified, with the aim of reducing the effect of the construction vehicle movements identified.

12.3.1 Assessment

The Institute of Environmental Management and Assessment (IEMA) guidance (1993) would form the basis for which the effects of traffic during the construction phase would be assessed. Based on the IEMA guidance, the factors identified as being the most discernible potential environmental effects likely to arise from changes in traffic movements have been set out below and would be considered in the assessment as potential effects which may arise from changes in traffic flows from the Proposed Development.

- **Noise and vibration** – the potential effect caused by additional traffic on sensitive receptors, which in this case would relate to hotel and lodging facilities, a primary school and some residences just off the A835.
- **Driver severance and delay** – the potential delays to existing drivers and their potential severance from other areas.
- **Community severance and delay** – the potential severance to communities and the delays to movements between communities.
- **Vulnerable road users and road safety** – the potential effect on vulnerable users of the road (i.e. pedestrians and cyclists).
- **Hazardous and dangerous loads** – the potential effect on road users and local residents caused by the movement of abnormal loads.
- **Dust and dirt** – the potential effect on dust, dirt and other detritus being brought onto the road.

The IEMA guidelines provide two thresholds when considering predicted increase in traffic, whereby a full assessment is required:

- where the total traffic would increase by 30% or more (10% in sensitive areas); and/ or
- where the HGV traffic would increase by 30% or more (10% in sensitive areas).

The potential sensitivity of the receptors to changes in traffic levels would be determined by considering the study area and presence of receptors in relation to each potential impact. The receptors would be assessed individually to determine its sensitivity and the assessment criteria is set out in Table 12-1.

Table 12-1: Receptor Sensitivity

Impact	Low Sensitivity	Medium Sensitivity	High Sensitivity
Noise and Vibration	No sensitive receptors	Presence of sensitive receptors near to the road	Presence of sensitive receptors adjacent to the road
Driver Severance and Delay	Road network not affected	Road network not experiencing congestion at peak times	Road network experiencing congestion at peak times
Community Severance and Delay	No presence of existing communities severed by the road network	Presence of existing communities with a moderate level of existing severance (subjective assessment)	Presence of existing communities with low existing severance (subjective assessment)
Vulnerable Road Users and Road Safety	Highly sensitive receptor		
Hazardous and Dangerous Loads	No hazardous or dangerous loads on the road network	Some hazardous or dangerous loads on the road network	Abnormal and oversized loads to use road network
Dust and Dirt	Limited presence of sensitive receptors (subjective assessment)	Low to medium presence of sensitive receptors (subjective assessment)	High presence of sensitive receptors (subjective assessment)

The magnitude of impact or change has been considered according to the criteria defined in Table 12-2.

Table 12-2: Magnitude Criteria

Impact	Negligible	Minor	Moderate	Major
Noise and Vibration	<25% increase in traffic	>25% increase in traffic Quantitative assessment based on predicted increase in traffic against measured baseline		
Driver Severance and Delay	<10% increase in traffic	>10% increase in traffic Quantitative assessment of road capacity based on existing traffic flows and predicted future traffic levels		
Community Severance and Delay	<10% increase in traffic	<30% increase in traffic	<60% increase in traffic	>60% increase in traffic
Vulnerable Road Users	<10% increase in traffic	>10% increase in traffic Quantitative assessment of existing provision and future traffic levels		
Road Safety	<10% increase in traffic	>10% increase in traffic Quantitative assessment of existing accident records and predicted increases in traffic		
Hazardous and Dangerous Loads	0% increase in traffic	<30% increase in traffic	<60% increase in traffic	>60% increase in traffic
Dust and Dirt	<10% increase in traffic	<30% increase in traffic	<60% increase in traffic	>60% increase in traffic

The cumulative impacts from any other local permitted wind farm developments will be a key consideration for the assessment, particularly in relation to the control of construction traffic in the local area. The cumulative assessment would focus on the construction phase as this would be the most likely period to create significant effects should construction phases overlap or occur sequentially amongst permitted developments.

The traffic assessment and draft traffic management plans would be reviewed for the other developments identified to be of direct relevance and on a similar construction timeline to the Proposed Development. The proposed construction timescales for these developments would be carefully considered. Operational sites are unlikely to create significant traffic effects and will, therefore, not be considered within the cumulative assessment. The assessment would focus on consented developments at application stage within close proximity to the site. Such sites will be identified and discussed with the Council(s).

12.4 Consultation

The scope of the study and assessment for the Proposed Development in relation to access, traffic and transport will seek to identify potential issues which may result from the construction of the Proposed Development. Consultation with stakeholders will be completed through the scoping process.

The Proposed Development will continue to be discussed with the following prescribed bodies and key stakeholders/ organisations:

- THC - consultation to discuss the potential impacts of the Proposed Development on the local road network and cumulative traffic effects; and
- Transport Scotland as the strategic roads authority.

12.5 Matters Scoped Out

Due to the negligible environmental effects which would occur during the operational and decommissioning phases of the Proposed Development, it is proposed that operational effects and decommissioning effects are scoped out of the access, traffic and transport assessment for the EIA. AILs would be considered in more detail within a separately submitted Abnormal Load Route Assessment (ALRA); the findings and recommendations from the report will be discussed within this section of the EIA Report with any impacts identified and assessed as required.

12.6 Questions for Consultees

- Q12.1 Confirmation that the proposed study area (the A835 from the A9 leading to Site access, to include turning area at Inchbae Lodge) is suitable?;
- Q12.2 Confirmation that traffic surveys as discussed above would be appropriate?; and
- Q12.3 Confirmation of any committed developments to be taken into account within the cumulative assessment?

12.7 References and Standard Guidance

- National Planning Framework 4 (Scottish Government, 2023)
- Planning Advice Note (PAN) 75
- Institute of Highways and Transportation (IHT) publication 'Guidelines for Traffic Impact Assessment'
- Transport Scotland's Transport Assessment Guidance (2012)
- 'Guidelines for the Environmental Assessment of Road Traffic' (1993) for the IEMA
- Highland Local Transport Strategy draft document (2010/11 – 2013/14)
- Highland-wide Local Development Plan (2012)
- Garve and District Community Development Plan (2019)

- DfT 'Design Manual for Roads and Bridges' (DMRB)

13. Forestry

13.1 Environmental Baseline and Potential Sources of Impact

13.1.1 Scope of Study and Study Area

This section of the report has been written by Sandy Anderson (BSc Hons; MBA; MICFor), principal consultant at DGA Forestry LLP. He is a chartered forester with over 45 years' experience in both the public and private sectors and has over 20 years' experience working on wind farms and other developments within forestry environments.

In the UK there is a strong presumption against permanent deforestation unless it addresses other environmental concerns. In Scotland, such deforestation is dealt with under the Scottish Government's 'Control of Woodland Removal Policy' (Forestry Commission Scotland, 2009). The purpose of the policy is to provide direction for decisions on woodland removal in Scotland. It will be essential that the Proposed Development addresses and satisfies the requirements of the Policy. The Forestry Study Area will be limited to woodlands within the site boundary.

13.1.2 Baseline Conditions including Field Studies

An initial desk-based assessment identified a small area of woodland within the site boundary which is recorded in the Native Woodland Survey of Scotland (Forestry Commission Scotland, 2013). The survey recorded it is comprised of 30% conifers and 70% birch woodland. Scottish Forestry publicly available databases identify that the woodlands were planted under a Woodland Grant Scheme between 1995 and 2001 as part of a larger project and comprised 47% conifers and 53% broadleaves. There are no woodlands within the site boundary recorded in the Ancient Woodland Inventory Scotland (Scottish Natural Heritage, 2010). The National Forest Inventory (Forestry Commission Scotland, 2018) identifies small areas of conifer woodland within the access corridor which may be affected by the proposed main access route to the Proposed Development. There is no Forest Plan detailing any future felling or restocking plans for the woodlands.

13.1.3 Potential Sources of Impact

There is potential for changes to the forest structure resulting from the Proposed Development. Areas of woodland may require to be felled for the construction and operation of the Proposed Development including for access tracks, wind turbine locations and other infrastructure, which may result in a loss of woodland area.

Forests are dynamic and constantly changing through for example landowner activities; market forces; natural events, such as windblow or pest and diseases; or developments. The forestry assessment will be a factual assessment describing the changes to the forest structure resulting from the incorporation of the Proposed Development into the forest structures, in particular the loss of woodland area. Other Chapters within the EIA Report will identify the sensitive receptors relevant to their disciplines and report on the effects of the Proposed Development forestry proposals.

13.2 Method of Assessment and Reporting

13.2.1 Baseline Description

The forestry baseline will describe the woodlands existing at time of preparation of the EIA Report. This will include current species; planting year; any management plans; and other relevant woodland information. The baseline will be compiled from a desk-based assessment and field surveys.

In addition to the surveys and databases referred to above the desktop assessment will include landowner woodland databases; aerial photography; and current Policy, Legislation and Guidance.

The field survey will consist of a site walkover to verify and update baseline data as necessary; assess the woodlands with respect to integration of the Proposed Development infrastructure; and to identify any opportunities within the site boundary for on-site compensatory planting, if any is required.

13.2.2 Assessment Methodology

A Proposed Development Forest Plan will be prepared. This will include a felling plan to show which woodlands are to be felled, and when, for the construction and operation of the Proposed Development. It will further include a restocking plan showing any areas which are to be replanted and with which species, and which areas are to be left unplanted for Proposed Development infrastructure.

A key issue will be the integration of the Proposed Development infrastructure into the woodland structure to minimise the loss of woodland area and to prevent fragmentation of the remaining woodlands.

The changes to the woodland structure will be analysed and described including changes to woodland composition. The resulting changes to the woodland structure will be assessed for compliance against the UK Forestry Standard and the requirement for compensation planting to mitigate against any woodland loss. Any woodland loss will be assessed against the baseline data in line with the methodology outlined in Annex V of the Control of Woodland Removal Policy Guidance (Forestry Commission Scotland, 2019).

13.3 Consultation

The main forestry statutory consultee is Scottish Forestry who would be consulted to ensure that the proposed changes to the woodlands address the requirements of the UK Forestry Standard (Forestry Commission, 2017), the Control of Woodland Removal Policy and other relevant guidelines. In addition there may be input into forestry issues by other consultees such as THC.

13.4 Matters Scoped Out

The changes to the woodlands for a particular development are regarded as site specific and it is considered there are no cumulative on-site forestry issues to be addressed, therefore cumulative forestry effects are scoped out of the EIA Report.

Given the small proportion of woodland within the site boundary it may be possible to scope forestry out of the EIA Report depending on the final design of the Proposed Development.

13.5 Questions for 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.

- Are consultees content with the proposed methodology and scope for the forestry assessment?
- Do the consultees have any information, particularly with reference to new guidance, which should be taken into account?
- References and Standard Guidance Forestry Commission (2017): The UK Forestry Standard: The Government's Approach to Sustainable Forestry, Forestry Commission, Edinburgh.
- Forestry Commission Scotland (2009). The Scottish Government's Policy on the Control of Woodland Removal. Forestry Commission, Edinburgh.
- Forestry Commission Scotland (2013). The Native Woodlands Survey of Scotland. Available at <https://scottishforestry.maps.arcgis.com/apps/webappviewer/index.html?id=0d6125cfe892439ab0e5d0b74d9acc18> (accessed on 16 May 2023).
- Forestry Commission Scotland (2018). The National Forest Inventory Woodland Scotland. Available at https://data-forestry.opendata.arcgis.com/datasets/b71da2b45dde4d0595b6270a87f67ea9_0 (accessed on 16 May 2023).
- Forestry Commission Scotland (2019). Guidance to Forestry Commission Scotland staff on implementing the Scottish Government's Policy on Control of Woodland Removal. Available at

<https://forestry.gov.scot/publications/349-scottish-government-s-policy-on-control-of-woodland-removal-implementation-guidance/viewdocument> (accessed on 3 March 2021).

- Scottish Natural Heritage (2010). Ancient Woodland Inventory Scotland. Available at: <https://map.environment.gov.scot/sewebmap/> (accessed on 16 May 2023).

14. Socio-economic, Tourism, Recreation and Land Use

14.1 Introduction

This section of the report has been prepared by Anne Dugdale (BSc, MRTPI) and Ben Wyper (BSc, MSc). Anne is a Technical Director with more than 30 years of professional experience. She has managed a wide range of planning applications and Environmental Impact Assessments for major projects throughout the UK including wind farms, mineral workings, landfill sites, waste treatment facilities, solar farms and biomass Combined Heat and Power (CHP) and has regularly led on stakeholder engagement. Her experience in business development and commercial awareness has led her to develop expertise in supply chain and employment & skills issues in socio-economic assessment.

Ben has over 2 years' experience in socio-economic assessments after completing his master's degree, where he had a focus on the impacts of energy production, specifically renewables. Since then, Ben has been immersed in a number of wind farm projects, of varying scale from smaller local projects to major projects of national significance.

Ben has also undertaken baseline reviews and socio-economic assessments on a number of wind farm developments throughout the UK and northern Scotland, building up a wealth of experience in both the industry and the needs of the region.

14.2 Environmental Baseline and Potential Sources of Impact

14.2.1 Scope of Study and Study Area

A three-tiered study area is proposed for the Socio-economic, Tourism, Recreation and Land Use assessment, defined as follows:

Wider Study Area (WSA)

The WSA is intended to encompass the area within which significant effects on employment and the local economy, including the tourism economy, could occur. The WSA is required for certain receptor groups because the majority of the business and labour market effects that could occur would be experienced by population and business centres located across a wide area. The WSA area will primarily be set at the area of THC's administrative area, but effects are also considered within the rest of Scotland and the UK where relevant.

Local Study Area (LSA)

The LSA provides an intermediate level of assessment in regard to the potential impacts on accommodation in the local area. It is proposed that the LSA would incorporate an area covering a 15km radius of the application boundary, offering a more reflective account of the accommodation businesses that could be impacted by the Proposed Development. This is due to the WSA being too large an area to give an accurate representation of the impact of the Proposed Development, conversely, the Local Area of Influence (LAI) is likely to be too remote and has a lack accommodation businesses around the site, therefore is not reflective of the accommodation that may be used by construction workers.

Local Area of Influence (LAI)

The LAI forms the focus for assessment of both direct and indirect effects on those land use and tourism receptors that are likely to experience effects at a more local level, this is considered to be the application boundary, together with an area extending to 5km from the site.

14.2.2 Baseline Conditions Including Field Studies

The assessment would use desk-based information sources to assess the likely effects, supplemented by consultation with relevant stakeholders where necessary, and professional judgement based on

previous experience. Sources will be identified in citations throughout, and the schedule of data sources used would be contained in a reference list at the end of the EIA Report.

The desktop baseline survey would cover the following topic areas:

- demographic and labour market characteristics (covering the occupational profile and the availability of skills within the labour force);
- employment, economic activity and unemployment trends;
- commuting and travel to work relationships;
- business demography: the number, size profile and sectoral representation of the business base;
- the tourism profile for the area, including tourism attractions and accommodation businesses;
- recreational receptors such as footpaths and shooting; and
- land use of the site.

The baseline research will then be used to identify the key receptors to be considered in the socio-economic, tourism, recreation and land use assessment. The key receptors considered to be impacted during the construction and operational phases are:

- local and national Gross Value Added (GVA) during the project lifetime;
- local and national employment during the project lifetime;
- local supply chain effects during the project lifetime;
- land use of the site, including recreational assets, such as tourist attractions or footpaths; and
- tourism assets and employment including regionally/nationally promoted recreational assets.

14.2.3 Potential Sources of Impact

During construction there are likely to be beneficial effects on the regional and Scottish economy, including employment opportunities for construction businesses in the region, and increased spend on local services and accommodation for workers. The Proposed Development would lead to investment within the Highlands region and Scotland and the assessment would identify the potential benefit to the regional supply chain and seek to quantify the potential effect on the WSA.

Construction activities may have a temporary adverse impact on certain local receptors including walkers and other users of recreational routes, such as people travelling along the Core Paths outside of the site. Effects on local accommodation businesses could occur due to the remoteness of the site, lack of immediately available accommodation sites and the potential competition with tourists.

Socio-economic effects during operation of the Proposed Development include employment associated with management and maintenance of the wind farm, albeit at relatively low staffing number.

A number of studies have examined whether there is a link between the development of wind farms and changes in patterns of tourism spend and behaviour, and generally the conclusion is that there is little effect. The assessment will draw upon the findings of these studies when examining whether the operational development may have an adverse effect on the local visitor economy. The presence of the wind farm may also affect individual tourism and recreational receptors through visual and other impacts; these will be assessed taking account of the findings of other assessments such as visual effects.

14.3 Method of Assessment and Reporting

There is no industry standard guidance for this assessment. The proposed method for the assessment, based on experience from similar projects, is detailed below and will take into consideration any matters raised in this scoping exercise. The assessment will:

- consider the social and economic policy context at the local, regional and national level;
- review socio-economic and recreation baseline conditions within the relevant study areas;
- assess the likely scale, scope, permanence and significance of identified effects, taking account of any embedded environmental or social measures proposed within the application;
- recommend mitigation measures, where appropriate; and

- assess cumulative effects of the Proposed Development with other proposed developments.

14.3.1 **Receptor Sensitivity**

Receptor sensitivity will be based on its importance or scale and the ability of the baseline to absorb or be influenced by the identified effects. For example, a receptor (such as the local construction supply chain or a public right of way) is considered less sensitive if there are alternatives with capacity within the relevant study area. In assigning receptor sensitivity. Consideration has been given to the following:

- the capacity of the receptor to absorb or tolerate change;
- importance of the receptor e.g. local, regional, national, international;
- the availability of comparable alternatives;
- the ease at which the resource could be replaced; and
- the level of usage and nature of users (e.g. sensitive groups such as people with disabilities).

Based upon professional judgement and experience on other large-scale projects, four levels of sensitivity have been used: high; medium; low; and negligible. These are defined in Table 14-1: Socio-Economic Receptor Sensitivity.

Table 14-1: Socio-Economic Receptor Sensitivity

Sensitivity	Description
High	The receptor: <ul style="list-style-type: none"> – has little or no capacity to absorb change without fundamentally altering its present character; or – is of high socio-economic, recreational, or tourism value²⁰; or – is of national or international importance; or – is accorded priority in national policy; or – has no alternatives with available capacity within its catchment area; or – is a destination in its own right (as regards tourism and visitor attractions).
Medium	The receptor: <ul style="list-style-type: none"> – has moderate capacity to absorb change without fundamentally altering its present character; or – has a moderate socio-economic, recreational or tourism value; or – is of regional importance; or – is accorded priority in local policy; or – has some alternatives with available capacity within its catchment area; or – is a destination for people already visiting the area (as regards tourism and visitor attractions); or – forms a cluster of low sensitivity receptors.
Low	The receptor: <ul style="list-style-type: none"> – is tolerant of change without detriment to its character; or – is of low socio-economic, recreational or tourism value; or – is of local importance; or – is accorded low priority in policy; or – has a choice of alternatives with available capacity within its catchment area; or – is an incidental destination for people already visiting the area (as regards tourism and visitor attractions).
Negligible	The receptor is resistant to change and is of low socio-economic, recreational or tourism value or there is a wide choice of alternatives with available capacity within its catchment area.

In order to aid clear and robust identification of significant effects, specific and targeted criteria for defining the magnitude of impacts have been developed for this assessment based on experience on other similar projects. The following four levels of magnitude will be adopted using professional judgement: high; medium; low and negligible, as shown on Table 14-2. These reflect the level of change relative to baseline conditions and /or whether the change would affect a large proportion of the existing

²⁰ Which may include being of high value to a user group of high sensitivity (e.g. mobility impaired users).

resident population or would result in a major change to existing patterns of use. These impacts can be beneficial, adverse or neutral.

Table 14-2: Socio-Economic Magnitude Criteria

Receptor Group	High	Medium	Low	Negligible
WSA economy	An impact that would dominate over baseline economic conditions by >10%.	An impact that would be expected to result in a moderate change to baseline economic conditions by >5%.	An impact that would be expected to result in a perceptible difference from baseline economic conditions by >0.5%.	An impact that would not be expected to result in a measurable variation from baseline economic conditions.
WSA labour market	An impact that would dominate over baseline labour market conditions and/or would affect a large proportion (>10%) of the existing resident workforce.	An impact that would be expected to result in a moderate change to baseline labour market conditions and/or would affect a moderate proportion (>5%) of the existing resident workforce.	An impact that would be expected to result in a perceptible difference from baseline labour market conditions and/or would affect a small proportion (>0.5%) of the existing resident workforce.	An impact that would not be expected to result in a measurable variation from baseline labour market conditions.
WSA tourism and visitor economy	An impact that would dominate over baseline tourism and visitor economy conditions.	An impact that would be expected to result in a moderate change to baseline tourism and visitor economy conditions.	An impact that would be expected to result in a perceptible difference to baseline tourism and visitor economy conditions	An impact that would not be expected to result in a measurable variation from baseline tourism and visitor economy conditions
Tourism and recreation assets	An impact that would be expected to cause a major restriction of access to or availability of tourism and visitor assets in the LAI or would result in a major change to existing patterns of use.	An impact that would be expected to have a moderate restriction of access to or availability of tourism and visitor assets in the LAI or would result in a moderate change to existing patterns of use.	An impact that would be expected to have a small restriction of access to or availability of tourism and visitor assets in the LAI or would result in a small change to existing patterns of use.	An impact that would be unlikely to result in a noticeable difference to tourism and visitor assets in the LAI.
Land use	An impact that would lead to a major restriction on the operation of a receptor, e.g. forestry business, or complete closure of receptor.	An impact that would lead to a moderate to major restriction on the operation of the receptor.	An impact that would lead to a minor restriction on the operation of the receptor.	An impact that would lead to a negligible restriction on the use of the receptor.

The level of effect of an impact on socio-economic receptors is initially assessed by combining the magnitude of the impact and the sensitivity of the receptor. Where an effect is classified as major, this is considered to represent a 'significant effect' in terms of the EIA Regulations, as shown on Table 14-3: Socio-Economic Significance Matrix. Where an effect is classified as moderate, this may be considered to represent a 'significant effect' but would be subject to professional judgement and interpretation, particularly where the sensitivity or impact magnitude levels are not clear or are borderline between categories or the impact is intermittent.

Table 14-3: Socio-Economic Significance Matrix

Sensitivity or Value of Resource or Receptor	Magnitude of Impact			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

Effects can be beneficial, neutral or adverse and these would be specified where applicable. It should be noted that significant effects need not be unacceptable or irreversible.

A statement of residual effects, following consideration of any specific mitigation measures, will be provided.

14.3.2 Reporting

In order to identify and assess the impact of the Proposed Development, the assessment will:

- consider the social and economic policy context at the local, regional and national level;
- review baseline conditions within the relevant study areas;
- assess the likely scale, scope, permanence and significance of identified effects, taking account of any embedded environmental or social measures proposed within the application;
- recommend mitigation measures, where appropriate; and
- assess cumulative effects of the Proposed Development with other proposed developments.

14.3.3 Cumulative Assessment

In relation to economic effects, cumulative effects depend on the extent to which the supply chain and labour market within the WSA have the capacity to meet demand for construction services from a number of similar projects. An assessment would be made as to whether it is considered likely that the cumulative effect indicates a loss of benefit as a result of cumulative projects, or an enhancement of opportunity which would help to develop expertise and capacity in the market. The cumulative effects assessment would be able to make a quantitative judgement on potential loss of benefit due to cumulative projects. Enhancement of opportunity is identified only in qualitative terms.

Other cumulative effects may arise if the construction and/or operation of a number of wind farms were to affect receptors in the LIA.

14.3.4 Proposed Mitigation

The assessment will take account of environmental principles that are incorporated into the design of the Proposed Development. These could include good practice measures with regard to traffic management, control of noise and dust, signage and provisions for maintaining access for walkers, details of which would be set out in a Construction and Environmental Management Plan (CEMP) and/or Construction Traffic Management Plan (CTMP). Any additional mitigation measures that would reduce the level of any significant effects would be considered prior to assessing residual effects.

14.4 Consultation

The assessment will use desk-based information sources to assess the likely effects, supplemented by consultation with stakeholders if relevant. Information to inform the baseline will be sought from various sources, including:

- The Highland Council (THC) ;
- Local Community Councils;
- British Horse Society Scotland;
- Cycling Scotland;
- Mountaineering Council of Scotland;
- Scottish Association for Country Sports;
- Scottish Rights of Way and Access Society;
- Sustrans Scotland; and
- VisitScotland.

Any consultation would have three key objectives:

- to verify published information;
- to identify potential effects; and
- to help assess significance of potential impacts.

14.5 Matters Scoped Out

Based on past experience of projects of this scale, it is not expected that there would be a large influx of workers' families to the area during the construction phase and those who would be working in the area would be there temporarily, for no more than 12-24 months; consequently it is not expected that there would be a significant effect on the demand for permanent housing, health or educational services.

The number of permanent employees for the operation of the Proposed Development are expected to be low, approximately 5-9 FTE on site workers combined and, as such, the demand for permanent housing, health or educational services is expected to low.

Recreational activities outwith the site will be scoped out unless they are promoted regionally/nationally and are therefore likely to draw in visitors from outside the area.

The impacts during the decommissioning phase are expected to be largely the same as those during the construction phase, albeit to a lesser degree and in approximately 40 years. To avoid a repetition of the construction phase assessment, the impacts on socio-economics, recreation, tourism and land use during the decommissioning phase have been scoped out of the assessment, however are likely to be addressed by a condition on the consent requiring a decommissioning plan to be submitted for approval towards the end of life of the Proposed Development.

14.6 Questions for Consultees

- Q14.1 Do consultees agree with the scope and extent of the baseline?
- Q14.2 Do consultees agree that the number and extent of the study areas are appropriate?
- Q14.3 Do consultees agree with the scope and scale of the study areas?
- Q14.4 Do consultees agree with the proposed methodology?
- Q14.5 Do consultees agree with the levels of significance offered?
- Q14.6 Do consultees agree with the levels of magnitude offered?
- Q14.7 Do consultees agree with the potential impacts that have been highlighted to be assessed?
- Q14.8 Do consultees agree with the impacts which have been scoped out of the assessment?

14.7 References and Standard Guidance

The assessment will follow current best practice guidance as set out in the following documents:

- NPF4 (2023)
- SNH (2013) A handbook on environmental impact assessment
- Scottish Government (2019) Good Practice Principles for Shared Ownership of Onshore Renewable Energy Developments
- Scottish Government (2019) Good Practice Principles for Community Benefits from Onshore Renewable Energy Developments
Scottish Government (2016) Draft Advice on Net Economic Benefit and Planning
- SNH (2015) Good Practice During Wind Farm Construction
- Tourism Scotland 2020

15. Aviation

15.1 Introduction

Wind turbines have the potential to affect civil and military aviation and meteorological forecasting. This section of the report covers the methodology used to undertake the aviation and radar scoping assessment, lists the references used and describes the baseline condition, consultation requirements and mitigations to be applied if required.

This section of the Scoping Report has been written by Cdr John Taylor RN (Ret) of Wind Power Aviation Consultants Ltd (WPAC). John has over 35 years' experience as an Air Traffic Controller, Fighter Controller and Aviation Regulator and was head of Air Traffic Control for the Royal Navy. His responsibilities included responding to wind farm consultations on and offshore. Since 2008, WPAC has provided advice on the interaction between wind turbines and aviation including assessing over 3,000 wind turbine proposals and giving evidence at over 20 Inquiries and Appeals in England and Scotland. John has also advised a number of Local Authorities on this issue. His team includes experts on radar propagation and modelling and low flying operations.

15.2 Environmental Baseline and Potential Sources of Impact

The Proposed Development is located 35km to the west-north-west of Inverness Airport. Figure 16.1 shows the location in an aviation context, underneath Class G unregulated airspace and just to the south of Class E regulated airspace designated as Y906 and marked with blue and purple boundaries, a route used to take traffic from Inverness to Stornoway and beyond. In a military context the Proposed Development is over 75km to the west of RAF Lossiemouth. It is also outside the boundary of the Highlands Restricted Airspace (HRA), a tactical low flying area, the boundary of which is marked in Figure 16.1 by a hashed and dashed thin purple line.

15.3 Guidance and Legislation

There are a number of aviation publications relevant to the interaction of turbines and aviation containing guidance and legislation, which cover the complete spectrum of aviation activity in the UK including:

- Civil Aviation Authority (CAA) (2016), Policy and Guidance on Wind Turbines, Version 6, CAP764, CAA
- Civil Aviation Authority (2019), Licensing of Aerodromes, Version 11, CAP 168, CAA
- Civil Aviation Authority (2019), ATS Safety Requirements, Version 3, CAP 670, CAA
- Civil Aviation Authority (2017), UK Flight Information Services, Ed. 3, CAP 774, CAA
- Civil Aviation Authority (2006) Safeguarding of Aerodromes, Version 2, CAP774 CAA
- Civil Aviation Authority (2010), Safe Operating Practices at Unlicensed Aerodromes Ed 1 CAP 783, CAA
- Civil Aviation Authority (2017), Manual of Air Traffic Services Part 1, Ed. 7.0, CAP 493, CAA
- Civil Aviation Authority (2020), Parachuting Ed, 5 CAP660, CAA
- Ministry of Defence (2022), Military Aviation Authority Regulatory Article 2330 (Low Flying) MOD
- Civil Aviation Authority (2017), CAA Policy Statement: Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150m Above Ground Level, CAA

15.4 Study Area

The assessment of effects of the proposed turbines will be based upon the guidance laid down in CAA Publication CAP 764 Policy and Guidelines on Wind Turbines Version 6 (February 2016). Consultation

criteria for aviation stakeholders is defined in Chapter 4. These distances inform the size of the study area and include:

- airfield with a surveillance radar – 30 km;
- non radar licensed aerodrome with a runway of more than 1.1 km – 17 km;
- non radar licensed aerodrome with a runway of less than 1.1 km – 5 km;
- licensed aerodromes where the turbines would lie within airspace coincidental with any published Instrument Flight Procedure (IFP);
- unlicensed aerodromes with runways of more than 800 metres – 4 km;
- unlicensed aerodromes with runways of less than 800 metres – 3 km;
- gliding sites – 10 km; and
- other aviation activity such as parachute sites and microlight sites within 3 km – in such instances developers are referred to appropriate organisations.

CAP 764 further states that these distances are for guidance purposes only and do not represent ranges beyond which all wind turbine developments will be approved or within which they will always be objected to. These ranges are intended as a prompt for further discussion between developers and aviation stakeholders and will be reported upon in the EIA Report. For example, Inverness Airport has stated a requirement to be consulted in relation to wind farms out to 40 km or even further if there is the potential to affect their operations or IFPs.

It is necessary to take into account the aviation and air defence activities of the Ministry of Defence (MOD) as safeguarded by the Defence Infrastructure Organisation (DIO). The types of issues that will be addressed in the EIA Report include:

- Ministry of Defence Airfields, both radar and non-radar equipped;
- Ministry of Defence Air Defence Radars;
- Meteorological Radars; and
- Military Low Flying.

It is necessary to take into account the possible effects of turbines upon the National Air Traffic Services En Route Ltd (NERL) communications, navigation and surveillance (CNS) systems – a network of primary and secondary radars and navigation facilities around the country.

As well as examining the technical impact of turbines on Air Traffic Control (ATC) facilities, it is also necessary to consider the physical safeguarding of ATC operations using the criteria laid down in CAP 168 Licensing of Aerodromes to determine whether a Proposed Development will breach obstacle clearance criteria. This will also be reported on in the EIA Report but initial surveys show there are no physical safeguarding issues associated with the Proposed Development.

15.5 Method of Assessment and Reporting

15.5.1 Criteria for the Assessment of Effects

There is no agreed definition for assessing significance in an aviation context. This is due to the fact that whilst technical effects on communications, navigation and surveillance (CNS) systems are simple to identify and evaluate, operational and flight safety effects can be subjective and are often challenged by third parties. It is enough in this context to identify any technical effects and then, taking into account the statements in CAP 764 regarding the status of aviation stakeholders, in general to accept the judgement of those stakeholders in assessing the significance of the effects. For example, CAP 764 states:

“Where an ANSP determines that it is likely that a planned wind turbine development would result in any of the above effects on their CNS infrastructure, this may not, in itself, be sufficient reason to justify grounds for rejection of the planning application. The ANSP must determine whether the effect on the CNS infrastructure has a negative impact on the provision of the ATS. The developer should pay for an assessment of appropriate mitigating actions that could be taken by the ANSP and/or wind energy

developer to deal with the negative impact. The position of an ANSP at inquiry would be significantly degraded if they had not considered all potentially appropriate mitigations.”

Taking the above into account, it is not considered appropriate for the Applicant to be making an assessment of significance of an effect in relation to aviation interests. It is also the case that different Air Navigation Service Providers (ANSP) can take a different view of the same scenario based on their varying responsibilities. Therefore, this assessment does not make a judgement of significance, but is focused on identifying potential impacts and agreeing mitigation with the relevant aviation stakeholders as required.

15.5.2 Radar Modelling Methodology

The radar calculation results referred to in this section were produced using specialist propagation prediction software (RView Version 5). Developed over a number of years, it has been designed and refined specifically for the task. RView will be used to identify potential aviation effects of the Proposed Development as its design evolves. The results will then be used as a basis for consultation and liaison with relevant aviation bodies, as detailed below.

15.6 Consultation

15.6.1 Licensed Aerodromes

Inverness Airport – is 35km to the east of the Proposed Development. Initial radar modelling against both the new Thales Star 2000NG primary surveillance radar (PSR) and the Terma Scantec 4002 wind farm mitigation radar being installed at the airport show that turbines with a tip height of 200 metres will be visible to both radars, however, these results will be updated when the final layout has been promulgated and reported in the EIA Report. The applicant will consult with Highlands and Islands Airports Ltd (HIAL) and provide any information required including the provision of an IFP Assessment by a CAA Approved Procedure Design Organisation (APDO) if required.

15.6.2 Unlicensed Aerodromes

There are no unlicensed aerodromes, gliding sites, parachute drop zones or microlight sites marked on aviation charts or known to exist within the required consultation distance of the Proposed Development as referred to in section 15.4.

15.6.3 Ministry of Defence

MOD ATC Radars – the only MOD ATC radar with coverage over the Proposed Development is at RAF Lossiemouth, 75km to the east. Initial radar modelling indicates that radar line of sight against the new Thales Star 2000NG radar currently being installed is in excess of 700 metres above ground level (AGL) and the radar will not be affected. These results will be updated and reported in the aviation section of the EIA Report and MOD DIO will be consulted to confirm these results.

MOD Air Defence Radars – the closest air defence radar is located at Remote Radar Head (RRH) Buchan, near Peterhead. Initial radar modelling shows that there is no possibility of the turbines being visible to or affecting the performance of the radar and this issue can be scoped out of the EIA Report chapter.

MOD Low Flying - the site is located within an MOD low flying area, however, it is designated as a 'Blue' area, so that a low flying objection is unlikely. There may be an initial concern expressed by the MOD but that will almost certainly be to ensure that Infra-Red lighting is applied. The Applicant will provide an aviation lighting scheme proposal and obtain MOD approval as part of the consultation process and application for consent. This will be reported in the Aviation Lighting Technical Appendix of the EIA Report.

15.6.4 Met Office Weather Radars

Met Office Radars - The Met Office safeguards its network of radars using a European methodology known as OPERA (Operational Programme for the Exchange of Weather Radar Information). In general, they will object to any proposed turbine within 5 km in line of sight and will examine the impact of any turbines within 20 km. Where a site is within 20 km, the Met Office will undertake an operational

assessment based on three main criteria, having determined if there is a technical effect on the radar. The factors they will consider include:

- proximity to airports;
- river catchment response times; and
- population density.

In this case the closest Met Office radar is at Hill of Dudwick, near Aberdeen, over 100 km to the east of the site. There will be no effect on Met Office radars and this issue can therefore be scoped out of the EIA Report.

15.6.5 **NATS En Route Ltd (NERL)**

An initial assessment has been conducted to determine any effect of the Proposed Development on NERL CNS infrastructure. The closest radars in the system are at Alanshill and Perwinnes (Aberdeen). Initial radar modelling shows that all of the proposed turbines will be screened by terrain, however NERL will confirm through their response to scoping that there will be no effect on any of their systems. This will be reported in the EIA aviation chapter.

15.6.6 **Aviation Obstruction Lighting**

A wind farm with tip heights in excess of 150m will need to be illuminated at the hub of selected turbines with medium intensity red aviation obstruction lighting. WPAC will design a lighting layout which minimises the number of lit turbines whilst fulfilling flight safety requirements and gain approval for the lighting layout from the CAA. This will be reported in the EIA Report within a technical appendix to describe the effect of aviation lighting on the environment and to inform the LVIA. It will also articulate the mitigation techniques available taking into account the extant legislation and guidance.

An infra-red lighting layout to fulfil MOD requirements will also be designed and approval obtained from the MOD and reported in the EIA Report.

15.7 **Matters Scoped Out**

It is proposed to scope out effects on the air defence radar located at RRH Buchan, near Peterhead for the reasons outlined in section 15.6.3. In addition it is considered there will be no effect on Met Office radars for the reasons outlined in section 15.6.4. and it is therefore proposed to scope these out of the EIA.

15.8 **Questions for Consultees**

- Q15.1 Consultees are requested to confirm that effects on the air defence radar located at RRH Buchan and Met Office radars can be scoped out of the assessment.

15.9 **References and Standard Guidance**

- Civil Aviation Authority (2016) *Policy and Guidance on Wind Turbines Version 6 CAP764*. CAA.
- Civil Aviation Authority (2019) *Licensing of Aerodromes, Version 11 CAP 168*. CAA.
- Civil Aviation Authority (2019) *ATS Safety Requirements Version 3 CAP 670*. CAA.
- Civil Aviation Authority (2017) *UK Flight Information Services, Ed 3 CAP 774*. CAA.
- Civil Aviation Authority (2006) *Safeguarding of Aerodromes Version 2 CAP774*. CAA.
- Civil Aviation Authority (2010) *Safe Operating Practices at Unlicensed Aerodromes Ed 1 CAP 783*. CAA.
- Civil Aviation Authority (2017) *Manual of Air Traffic Services Part 1 Ed 7.0 CAP 493*. CAA.
- Civil Aviation Authority (2020) *Parachuting Ed 5 CAP660*. CAA.
- Ministry of Defence (2022) *Military Aviation Authority Regulatory Article 2330 (Low Flying)*. MOD.
- Civil Aviation Authority (2017) *CAA Policy Statement: Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150m Above Ground Level*. CAA.

16. Other Environmental Issues

16.1 Introduction

This section of the report was undertaken by Tim Doggett (BSc, MSc), who is an Associate EIA Consultant with over 10 years of experience in undertaking wind farm design and shadow flicker impact assessments for EIAs in the UK and Ireland.

A single chapter of the EIA Report will be prepared to draw together the implications of the Proposed Development on other facets of the environment that have been scoped out of the EIA process, or to signpost readers to where they are dealt with within technical chapters of the EIA Report. The chapter would also contain non-environmental elements often contained within EIA Report. It is anticipated that this chapter would include discussion of the following issues:

- Infrastructure, Telecommunications and Broadcast Services;
- Shadow Flicker;
- Ice Throw;
- Air Quality;
- Population and Human Health;
- Major Accidents and Disasters;
- Waste and Environmental Management; and
- Public Access.

16.2 Infrastructure, Telecommunications and Broadcast Services

16.2.1 Infrastructure

A range of investigations will be undertaken to establish the presence of existing infrastructure associated with utilities such as water, gas, electricity and telecommunication links to establish either the absence of effects or to identify appropriate mitigation to overcome any effects. These matters would be addressed through consultation with the relevant system operators.

16.2.2 Telecommunications

Wind turbines have the capability of affecting electromagnetic transmissions by physically blocking or dispersing the transmission/signal. This means that telecommunications and/or broadcast signals could experience interference.

A microwave link communication tower is located on Meall Ruighe an Fhìrich. The communication tower is located within the site boundary, and the microwave links originating from it will be considered during the design phase through liaison with the microwave link operators.

Consultation will be undertaken with Ofcom and key providers of these services in order to ascertain any potential telecommunications issues.

16.2.3 Television Reception

Wind turbines have the potential to adversely affect analogue television reception through either physical blocking of the transmitted signal or, more commonly, by introducing multi-path interference where some of the signal is reflected through different routes.

The Proposed Development is located in an area which is served by a digital transmitter and, therefore, television reception is unlikely to be affected by the Proposed Development as digital signals are rarely affected. In the unlikely event that television signals are affected by the Proposed Development, mitigation measures will be considered by the Applicant.

Television reception is, therefore, scoped out from further assessment in the EIA.

16.2.4 Other Terrestrial Broadcasts

Broadcast radio (FM, AM and DAB digital radio) are transmitted on lower frequencies than those used by terrestrial television signals. Lower frequency signals tend to pass through obstructions more easily than the higher frequency signals, and diffraction effects also become more significant at lower frequencies. Both these factors will tend to lessen the impact of new structures on broadcast radio (Ofcom, 2009).

It is therefore proposed that an assessment of potential effects on broadcast radio is scoped out of the EIA.

16.2.5 Fixed Links

Ofcom is responsible for the licensing of two-way radio transmitters. It holds a register of most fixed links and will therefore be consulted in order to establish baseline conditions. However, because not all fixed links are published, system operators will also be individually consulted on the potential for the Proposed Development to cause electromagnetic interference. The outcome of this consultation process, including any mitigation actions taken, will be detailed in the EIA Report.

16.3 Shadow Flicker

Shadow flicker occurs when a certain combination of conditions prevail at a certain location, time of day and year. It firstly requires the sun to be at a certain level in the sky. The sun then shines onto a window of a residential dwelling from behind the wind turbine rotor. As the wind turbine blades rotate it causes the shadow of the turbine to flick on and off. This may have a negative effect on residents in affected properties. If shadow flicker cannot be avoided through design, technical mitigation solutions are available, such as shutting down turbines when certain conditions prevail.

(THC's Onshore Wind Supplementary Guidance (2016) requires that wind farm applications undertake shadow flicker assessments for a minimum distance of 11 rotor diameters.

The rotor diameter of the proposed turbines is anticipated to be up to 155m; so the potential area in which shadow flicker could occur would be up to 1,705m from the proposed turbine locations. The nearest residential properties are Strathgarve Lodge and Stable Cottage (approximately 900m to the nearest turbine), and Silverbridge (approximately 1,100m to the nearest turbine).

Once the final turbine layout and parameters are fixed, the locations of residential properties in proximity to the site will be verified and if any are situated within eleven rotor diameters from the proposed turbine positions, a shadow flicker model will be run to predict potential levels of effect. Shadow flicker is considered as an environmental constraint during the design process.

Based on the design of the Proposed Development undertaken to date, and the number of residential properties found in the surrounding area, it is likely that a full shadow flicker assessment will be required for the EIA, covering residential properties within 11 rotor diameters of turbines, within 130 degrees either side of north.

16.4 Ice Throw

Icing in Scotland is likely to be a rare occurrence, with the Icing Map of Europe (WECO, 2000) showing Scotland to be within a light icing area with an annual average of only 2-7 icing days per year.

The risk associated with ice throw affecting members of the public is considered to be very low given the remote location of the Proposed Development.

This is reduced further as turbines are fitted with vibration sensors which shut the turbines down should any imbalance that might be caused by icing be detected.

To further minimise the risk, the following mitigation measures will be taken:

- Service crews will be trained regarding the potential for ice throw;
- Ice risk conditions will be monitored by the wind farm operator; and
- Public notices will be displayed at access points alerting members of the public and staff accessing the site of the possible risk of ice throw under certain weather conditions.

It is therefore proposed that ice throw is scoped out of the EIA.

16.5 Air Quality

Given the relatively remote location of the site, the generation of dust during construction activity is unlikely to have a direct impact on any human receptors and will be controlled by means of best practice to be described in the EIA Report.

Consideration will be given within the Ecology and Geology, Hydrogeology, Hydrology and Soils Chapters to the potential impacts that dust generation could have on any identified sensitive ecological or hydrological receptors. If required, detailed mitigation measures will be proposed within these EIA Report Chapters.

16.6 Population and Human Health

The potential effects on population and human health arising from the Proposed Development would be considered in the context of the other factors identified in Schedule 4(4) of the 2017 EIA Regulations, given that any environmentally related health issues (both beneficial and adverse) are likely to result from, for example, exposure to traffic, changes in living conditions resulting from noise and increased employment opportunities.

It is therefore proposed that population and human health effects of the Proposed Development are incorporated within the relevant chapter of the EIA Report, as appropriate, under each of the other relevant topic headings e.g. noise and / or socio-economic effects. Where no significant effects are likely these will be scoped out of the assessment.

16.7 Major Accidents and Disasters

The scope for the EIA to consider major accidents and disasters has been initially considered in Table 16.1. Major accidents or disasters have been scoped in where they represent a risk to the Proposed Development, either from the proposed location or the project itself. A high risk is considered to be where there is reasonable likelihood of the accident or disaster occurring, or where the effect of the accident or disaster would lead to the requirement for mitigation which is beyond the usual scope of construction or operational activities.

Where an accident or disaster is scoped in, the EIA Report chapter(s) identified would consider the matter in more detail. This further detail may show that no further assessment is needed, or it may lead onto an appropriate level of assessment and/or identification of mitigation.

Table 16-1: Major Accidents and Disasters

Major Accident or Disaster	Risk due to location	Risk due to Project	Scoped in/out due to risk	Rationale	EIA Report Chapter
Earthquakes	No	No	Out	Any earthquakes in the vicinity of the Proposed Development are predicted to be of a very small magnitude. The design of foundations would enable turbines to withstand such low magnitude events.	n/a

Major Accident or Disaster	Risk due to location	Risk due to Project	Scoped in/out due to risk	Rationale	EIA Report Chapter
Biological hazards: epidemics	Very Low	Very Low	Out	The likelihood of any epidemics affecting the construction or operation of the Proposed Development is predicted to be very low.	n/a
Biological hazards: animal and insect infestation	Very Low	Very Low	Out	The likelihood of any animal and insect infestations affecting the construction or operation of the Proposed Development is considered to be very low	n/a
Famine / food insecurity	Negligible	Very Low	Out	The likelihood of famine/food insecurity affecting the construction or operation of the Proposed Development is considered to be Negligible.	n/a
Tsunamis	No	No	Out	The location of the Proposed Development and its distance from the marine environment means there is no risk of Tsunamis affecting the Proposed Development	n/a
Volcanic eruptions	No	No	Out	There are no active volcanos anywhere near the Proposed Development	n/a
Displaced populations	Negligible	Very Low	Out	Displacement at a population level is not considered to have occurred in the vicinity of the Proposed Development.	n/a
Severe weather; droughts	Very low	No	Out	Drought conditions would not affect the operation of the Proposed Development.	n/a
Landslide/subsidence	Low	Low	In	If surveys record significant quantities of peat at the site a peat landslide and hazard risk assessment would be undertaken.	Peat Management, Carbon Balance
Severe Weather; storms	Medium	No	Out	Turbines have lightning conductors and when wind speeds are at a level which could cause damage to components would automatically shut down.	n/a
Severe weather; extreme temperatures	Low	Very low	Out	Location leads to relatively low icing risk, remote location, turbine sensors, mitigation as follows: <ul style="list-style-type: none"> • Service crews would be trained in relation to ice throw 	n/a

Major Accident or Disaster	Risk due to location	Risk due to Project	Scoped in/out due to risk	Rationale	EIA Report Chapter
				<ul style="list-style-type: none"> • Ice risk conditions would be monitored by the operator of the Proposed Development • Public notices to be displayed at access points to alert the public and staff the potential risk of ice throw under certain weather conditions. 	
Cyber attacks	No	No	Out	n/a	n/a
Floods	Low	Very Low	In	Damage to infrastructure and / or turbines from flooding, or increased flood risk elsewhere.	Site Selection and Design Evolution, Hydrology, Hydrogeology and Geology.
Terrorist Incidents	No	No	Out	n/a	n/a
Disruptive industrial activities	No	No	Out	n/a	n/a
Public disorder	No	No	Out	n/a	n/a
Wildfires	No	No	Out	n/a	n/a
Poor Air Quality events	No	No	Out	n/a	n/a
Transport accidents	No	Yes	In – abnormal loads and increase in traffic from construction.	Abnormal loads or an increase in traffic could increase - accident risk. Increase in risk if public road network is unsuitable for such traffic.	Design evolution and Traffic and Transport.
Industrial accidents	No	Yes	In – from construction and maintenance	Increased risk of industrial accidents due to working at height, manual labour, high voltages and use of specialist plant. All relevant health and safety legislation and industry best practice would be followed.	Site Selection and Design Evolution, Utilities and Infrastructure.
Urban Fires	No	No	Out	n/a	n/a

16.8 Waste and Environmental Management

Carn Fearna Wind Farm Ltd is committed to pollution prevention and environmental protection. As such an environmental management strategy to minimise the potential environmental effects of the Proposed Development will be developed as part of the Outline Construction Environment Management Plan (CEMP).

An Outline Peat Management Plan will be prepared as a supporting technical appendix in line with the SEPA Regulatory Position Statement: Developments on Peat (2012). If significant peat deposits are proven, a Peat Landslide Hazard and Risk Assessment will be completed using the site survey data and slope analysis (using Digital Terrain Model data), highlighting areas that may be impacted by a peat landslide so that appropriate mitigation measures can be identified.

If the Proposed Development is granted consent, a site-specific Waste Management Plan which addresses storage and final disposal of surplus material will be produced as part of an anticipated planning condition. All potential waste streams will be identified and construction practices that can be incorporated into the Proposed Development to minimise the use of raw materials and maximise the use of secondary aggregates will be identified.

16.9 Public Access

A desk-based study including review of THC Core Paths Plan indicates that no Core Paths are found running across the site.

However, the following Core Paths are found in the close vicinity:

- RC20.01 - Silverbridge Circuit – runs through the Torr Breacc forest and to a car park and toilet located off the A835;
- RC20.02 - Tor Breac – additional route running from the car park to Home Farm;
- RC20.03 - Kinellan to Strathgarve – runs from Bogie Falls to the south of the site, past Loch na Croic and along Loch Garve, to Strathgarve Lodge; and
- RC20.04 – Village river path in Garve.

Options will be examined at the time of the application to examine if it is feasible to open up public access to certain areas of the site, such as linking up the Core Paths to any historic features which may be found within the site for example. This would depend on any leasing agreements made between the landowner and the Applicant.

16.10 Matters Scoped Out

As discussed above, television reception, broadcast radio, ice throw and air quality assessments are proposed to be scoped out of the EIA. It is also proposed to scope out major accident and disasters as these are not considered to be high risk as a result of the location of the Proposed Development or the nature of the works, as outlined in Table 16.1.

16.11 Questions for Consultees

- Q16.1 Consultees are requested to confirm that television reception, broadcast radio, ice throw, air quality and major accidents and disasters can be scoped out of the assessments.

16.12 References and Standard Guidance

Icing Map of Europe. Available online at https://www.researchgate.net/figure/Icing-map-of-Europe-1_fig1_329418158

Highland Council, Onshore Wind Supplementary Guidance, 2016. Available at https://www.highland.gov.uk/downloads/file/18793/onshore_wind_energy_supplementary_guidance_november_2016

Scottish Environmental Protection Agency, Regulatory Position Statement: Developments on Peat, 2010. Available at https://www.sepa.org.uk/media/143822/peat_position_statement.pdf

Appendix 1.1 Consultees and stakeholders

Appendix 1.1 Consultees and stakeholders

Statutory Consultees
The Highland Council
Historic Environment Scotland
NatureScot
SEPA
Non-Statutory Consultees
Aberdeen Airport
British Horse Society
BT
Civil Aviation Authority - Airspace
Cromarty Firth Fishery Board
Crown Estate Scotland
Defence Infrastructure Organisation
Edinburgh Airport
Glasgow Airport
Glasgow Prestwick Airport
Highlands & Islands Airport Limited (HIAL)
John Muir Trust
Joint Radio Company
Mountaineering Scotland
NATS Safeguarding
Oban Airport
RSPB Scotland
Scottish Forestry
Scottish Water
ScotWays
Transport Scotland
Visit Scotland
Woodland Trust Scotland
Community Councils
Beaully Community Council
Conon Bridge Community Council
Cromarty Community Council
Contin Community Council
Dingwall Community Council
Ferintosh Community Council
Garve & District Community Council

Community Councils
Kilmorack Community Council
Kiltearn Community Council
Marybank, Scatwell and Strathconon Community Council
Maryburgh Community Council
Muir of Ord Community Council
Resolis Community Council
Strathpeffer Community Council

Appendix 10.1 Designated Heritage Assets within 10km of the Site Boundary

Appendix 10.1 Designated Heritage Assets within 10km of the Site Boundary

Table 10.1.1 Designated Heritage Assets within 10km of the Site Boundary

DES_REF	ENT_TITLE	DES_TYPE	CATEGORY
LB1768	Manse, Contin	Listed Building	C
LB1769	Coul House	Listed Building	A
LB1770	West Lodge, Coul House	Listed Building	C
LB1771	Mains Of Coul	Listed Building	B
LB1772	Free Church Manse, Jamestown	Listed Building	B
LB1773	Kinellan Farmhouse	Listed Building	C
LB1774	Burial Ground, Lochluichart Parish Church	Listed Building	B
LB1774	Lochluichart Parish Church	Listed Building	B
LB1775	Lochluichart Parish Manse	Listed Building	C
LB1775	Steading, Lochluichart Parish Manse	Listed Building	C
LB1778	Scatwell House	Listed Building	C
LB1778	Walled Garden, Scatwell House	Listed Building	C
LB1778	Community Centre And Estate Cottages, Scatwell House	Listed Building	C
LB1779	East Lodge, Scatwell House	Listed Building	C
LB1789	Old Bridge, Contin	Listed Building	A
LB1790	Burial Ground, Contin Church Of Scotland Parish Church	Listed Building	B
LB1790	Contin Church Of Scotland Parish Church	Listed Building	B
LB1822	Drynie House	Listed Building	C
LB7825	Cottage, Beechwood House, Fodderty	Listed Building	B
LB7825	Barn Cottage, Beechwood Steading, Fodderty	Listed Building	B
LB7825	Beechwood, Fodderty	Listed Building	B
LB7825	Byre Cottage, Beechwood Steading, Fodderty	Listed Building	B
LB7825	Stable Cottage, Beechwood Steading, Fodderty	Listed Building	B
LB7826	Castle Leod	Listed Building	A
LB7827	Gate Lodge, Castle Leod	Listed Building	B
LB7828	Fodderty Lodge, Fodderty	Listed Building	C
LB7829	Burial Ground, Parish Church, Fodderty	Listed Building	C
LB7830	Inchvannie House	Listed Building	B
LB7831	Keppoch House	Listed Building	C
LB7832	Fodderty And Strathpeffer Church Of Scotland Parish Church, Strathpeffer	Listed Building	B
LB7833	Upper Pump Room, Strathpeffer	Listed Building	B
LB7834	Station, Strathpeffer	Listed Building	B

DES_REF	ENT_TITLE	DES_TYPE	CATEGORY
LB7835	Spa Cottage, Strathpeffer	Listed Building	B
LB7836	Spa Pavilion, Strathpeffer	Listed Building	B
LB7837	Strathpeffer Hotel, Strathpeffer	Listed Building	C
LB7838	Kildonan, Strathpeffer	Listed Building	C
LB7838	Strathview, Strathpeffer	Listed Building	C
LB7839	The Red House, Strathpeffer	Listed Building	B
LB7840	Timaru House Hotel, Strathpeffer	Listed Building	B
LB7841	Timuka, Strathpeffer	Listed Building	C
LB7851	The Old Mill, Millnain	Listed Building	C
LB7852	Gate Piers, Ben Wyvis Hotel, Strathpeffer	Listed Building	C
LB7852	Ben Wyvis Hotel, Strathpeffer	Listed Building	C
LB7853	Craigvar, Strathpeffer	Listed Building	C
LB7854	Dunnichen, Strathpeffer	Listed Building	B
LB7855	Dunraven Lodge, Strathpeffer	Listed Building	B
LB7856	Eaglestone House, Strathpeffer	Listed Building	B
LB7857	St Anne's Episcopal Church, Strathpeffer	Listed Building	B
LB7858	Strathpeffer Free Church Of Scotland Church, Strathpeffer	Listed Building	B
LB7859	1-2 Hamilton House, Strathpeffer	Listed Building	C
LB7860	Heatherlie, Strathpeffer	Listed Building	B
LB7861	Highland Hotel, Strathpeffer	Listed Building	B
LB7862	Holly Lodge Hotel, Strathpeffer	Listed Building	B
LB7863	Kinnettas House, Strathpeffer	Listed Building	B
LB10949	White Lodge, Strathpeffer	Listed Building	B
LB13238	Nicolson Mackenzie Memorial Hospital, Strathpeffer	Listed Building	B
LB13239	Nutwood Steading, Strathpeffer	Listed Building	C
LB14025	West Lodge, Brahan Castle	Listed Building	C
LB14027	Lady Mackenzie's Monument, Brahan Castle	Listed Building	B
LB14029	Easter Moy	Listed Building	B
LB14030	Fairburn Tower	Listed Building	A
LB14031	Fairburn House	Listed Building	B
LB51709	Torr Achilty Power Station And Dam, Conon Valley Hydro Electric Scheme	Listed Building	C
SM2397	Preas Mairi, chambered cairn	Scheduled Monument	Prehistoric ritual and funerary: chambered cairn
SM2720	Little Garve, bridge over Black Water	Scheduled Monument	Secular: bridge
SM11056	Carn na Buaille, fort 750m NNW of Comrie, Contin	Scheduled Monument	Prehistoric domestic and defensive: fort

DES_REF	ENT_TITLE	DES_TYPE	CATEGORY
			(includes hill and promontory fort)
SM3987	Loch Kinellan, crannog	Scheduled Monument	Secular: crannog (with post-prehistoric use)
SM4728	Firth View, settlement 1300m NW of	Scheduled Monument	Prehistoric domestic and defensive: hut circle, roundhouse
SM10495	Strath Sgitheach, settlement NW of Cnoc a'Mhuilinn	Scheduled Monument	Prehistoric domestic and defensive: hut circle, roundhouse; Prehistoric ritual and funerary: cupmarks or cup-and-ring marks and similar rock art
SM1667	Achilty, henge, Contin	Scheduled Monument	Prehistoric ritual and funerary: henge
SM1676	Clach an Tiompain, symbol stone	Scheduled Monument	Crosses and carved stones: symbol stone
SM1672	Knock Farril, fort, Knockfarrel, Fodderty	Scheduled Monument	Prehistoric domestic and defensive: fort (includes hill and promontory fort)
SM2312	Heights of Brae, chambered cairn 375m NNW of Firth View	Scheduled Monument	Prehistoric ritual and funerary: chambered cairn
SM2396	Balnacrae, chambered cairn 230m WSW of	Scheduled Monument	Prehistoric ritual and funerary: chambered cairn
SM2466	Clachan Corrach, chambered cairn 375m E of Beallach Farm	Scheduled Monument	Prehistoric ritual and funerary: chambered cairn
SM3839	Brahan Wood, chambered cairn 835m NW of Brahan House	Scheduled Monument	Prehistoric ritual and funerary: chambered cairn
SM13645	Heights of Brae, boulder containing prehistoric rock art, 110m SSE of Ivy Croft	Scheduled Monument	Prehistoric ritual and funerary: cupmarks or cup-and-ring marks and similar rock art
SM13745	Henge, 135m SW of Fiodh Mhor	Scheduled Monument	Prehistoric ritual and funerary: henge
GDL00094	Castle Leod	Garden and Designed Landscape	Cultural
GDL00370	The Spa Gardens, Strathpeffer	Garden and Designed Landscape	Cultural
GDL00068	Brahan	Garden and Designed Landscape	Cultural
GDL00174	Fairburn	Garden and Designed Landscape	Cultural

DES_REF	ENT_TITLE	DES_TYPE	CATEGORY
CA123	Strathpeffer	Conservation Area	Cultural

Appendix 10.2 Initial settings appraisal of designated heritage assets with potential to be affected

Appendix 10.2 - Initial settings appraisal of designated heritage assets with potential to be affected

The appraisal below is an initial appraisal of the designated heritage assets with potential to be affected by the Proposed Development. All assets which currently fall outwith the ZTV will be monitored throughout the design process for any potential impact due to changes in layout.

Table 10.2.1 Initial settings appraisal

Designation Reference	Designation Title	Designation Type	Predicted Visibility (ZTV – number of turbines)	Distance in km	Direction from Site	Appraisal comments
SM2397	Preas Mairi, chambered cairn	Scheduled Monument	14	6.3	Southeast	The asset is located along the eastern bank of Black Water, sitting within the lower levels of the Black Water Valley. Often placed as markers along watercourses, as well as acting as burial monuments, cairns would have been highly visible when approaching through the landscape. The Proposed Development is anticipated to be fully visible from the asset, as well as within these approaches to and from the asset along the Black Water river. However, due to the orientation of the valley, the Proposed Development will be peripheral to any key views along these approaches. Furthermore, the asset sits within a wider prehistoric landscape and shares potential intervisibility with a nearby

Designation Reference	Designation Title	Designation Type	Predicted Visibility (ZTV – number of turbines)	Distance in km	Direction from Site	Appraisal comments
						contemporary cairn (SM2466). The orientation of the Proposed Development means that the proposed turbines will not impact the intervisibility between the assets. As such, the Proposed Development is not predicted to impact the ability to understand, appreciate, and experience the asset. It is excluded from further assessment.
SM2720	Little Garve, bridge over Black Water	Scheduled Monument	9	1.7	West	The assets setting comprises Black Water over which it is constructed, originally used to transport troops as part of a military road between Contin and Poolewe during the Jacobite rebellion. The asset’s significance derives from its historical context, as well as its good preservation, meaning that the ability to appreciate, understand, and experience the asset is intact. Whilst 9 turbines are anticipated to be visible from the asset, they are not anticipated to impact the aspects of the asset that contribute to its significance. As such, the asset is excluded from further assessment.

Designation Reference	Designation Title	Designation Type	Predicted Visibility (ZTV – number of turbines)	Distance in km	Direction from Site	Appraisal comments
SM11056	Carn na Buaille, fort 750m NNW of Comrie, Contin	Scheduled Monument	14	5	South	<p>The asset functioned as a domestic and defensive settlement on the slopes to the north of the River Conon and the associated valley, with the approach from the south. The asset's setting comprises its location above the valley and the River Conon, over which it would have had command and control, as well as a natural defensive position.</p> <p>There is potential for 14 turbines to be visible from the asset itself, but there are no turbines anticipated to be visible along approaches to and from the asset through the valley. Any views of turbines from the asset would be peripheral to these key views, and would not affect the ability to understand, appreciate or experience the asset and its setting. There are no predicted impacts upon the significance of the asset and therefore it will be excluded from further assessment.</p>
SM3987	Loch Kinellan, crannog	Scheduled Monument	0	5	Southeast	Due to the asset falling outwith the ZTV, it is currently scoped out of further assessment. In

Designation Reference	Designation Title	Designation Type	Predicted Visibility (ZTV – number of turbines)	Distance in km	Direction from Site	Appraisal comments
						addition, the Proposed Development is not anticipated to impact on the ability to understand or appreciate the shared intervisibility between contemporary assets (e.g., SM2397, SM2466) in the factors which contribute to their significance.
SM4728	Firth View, settlement 1300m NW of	Scheduled Monument	13	7	East	<p>These prehistoric settlements are located on a south-eastern facing slope above the River Sgitheach. The assets are separated by approximately 250m.</p> <p>The setting of these assets comprises the strategic elevated position in which they are located, controlling the Sgitheach valley to the south, which runs east to west. Furthermore, the steep slope upon which they sit would form a natural defence. Key approaches to the assets would be along the Sgitheach valley. Due to their proximity, intervisibility between the two assets was likely to have been important.</p>
SM10495	Strath Sgitheach, settlement NW of Cnoc a'Mhuilinn	Scheduled Monument	7	7.5	East	

Designation Reference	Designation Title	Designation Type	Predicted Visibility (ZTV – number of turbines)	Distance in km	Direction from Site	Appraisal comments
						<p>There is a possible visibility of 7 to 13 proposed turbines from these assets, with a range of visibility of 0 to 13 turbines along the key approaches. Due to the distance of the Proposed Development from the assets, it is not anticipated to impact on any intervisibility. The Proposed Development is likely to be a minor distraction to any key views to and from the asset, and there is no anticipated impact on the ability to appreciate, understand or experience the asset.</p> <p>It is therefore scoped out of further assessment.</p>
SM2312	Heights of Brae, chambered cairn 375m NNW of Firth View	Scheduled Monument	13	7.4	East	Scoped In
SM1667	Achilty, henge, Contin	Scheduled Monument	0	4.8	South	Due to the asset falling outwith the ZTV, it is currently scoped out of further assessment. In addition, the Proposed Development is not anticipated to impact on the ability to understand or appreciate the

Designation Reference	Designation Title	Designation Type	Predicted Visibility (ZTV – number of turbines)	Distance in km	Direction from Site	Appraisal comments
						shared intervisibility between contemporary assets (e.g., SM13745) in the factors which contribute to their significance.
SM1676	Clach an Tiompain, symbol stone	Scheduled Monument	0	5.6	Southeast	Due to the asset falling outwith the ZTV, it is currently scoped out of further assessment. In addition, the Proposed Development is not anticipated to impact on the ability to understand or appreciate the shared intervisibility between contemporary assets in the factors which contribute to their significance.
SM1672	Knock Farril, fort, Knockfarrel, Fodderty	Scheduled Monument	14	7.3	Southeast	Scoped In.
SM2396	Balnacrae, chambered cairn 230m WSW of	Scheduled Monument	0	9.8	East	Due to the asset falling outwith the ZTV, it is currently scoped out of further assessment. In addition, the Proposed Development is not anticipated to impact on the ability to understand or appreciate the shared intervisibility between contemporary assets (e.g., SM2466, SM3839) in the factors which contribute to their significance.

Designation Reference	Designation Title	Designation Type	Predicted Visibility (ZTV – number of turbines)	Distance in km	Direction from Site	Appraisal comments
SM2466	Clachan Corrach, chambered cairn 375m E of Beallach Farm	Scheduled Monument	14	7.2	Southeast	Scoped In.
SM3839	Brahan Wood, chambered cairn 835m NW of Brahan House	Scheduled Monument	0	9.3	Southeast	Due to the asset falling outwith the ZTV, it is currently scoped out of further assessment. In addition, the Proposed Development is not anticipated to impact on the ability to understand or appreciate the shared intervisibility between contemporary assets (e.g., SM2396, SM2396) in the factors which contribute to their significance.
SM13645	Heights of Brae, boulder containing prehistoric rock art, 110m SSE of Ivy Croft	Scheduled Monument	8	8	East	The assets significance derives from its rare rock art class, with the potential to enhance our ability to further understand prehistoric rock art in Scotland. The asset has been moved from its original position, and as such, its setting no longer contributes to its significance. Any visibility of the turbines would have no impact on the ability to appreciate, understand or experience the asset. There are no predicted impacts upon the

Designation Reference	Designation Title	Designation Type	Predicted Visibility (ZTV – number of turbines)	Distance in km	Direction from Site	Appraisal comments
						significance of the asset and therefore it will be excluded from further assessment.
SM13745	Henge, 135m SW of Fiodh Mhor	Scheduled Monument	14	8	Southeast	Scoped In.
GDL00094	Castle Leod	Inventoried Garden and Designed Landscape	0 - 12	5.3	Southeast	<p>The assets are a Garden and Designed Landscape (GDL), designed around the associated Category A listed Castle Leod. The primary approach through the GDL is a tree lined drive from the south currently accessed from the A834. There is a secondary entrance to the estate from the village of Achtemeed to the northeast. An ornamental woodland, with designed drives, is located to the north of the Castle.</p> <p>There is no anticipated visibility of the proposed turbines from Castle Leod, or within key views towards Castle Leod (e.g., along the southern driveway). Furthermore, whilst it is anticipated that there would be some visibility of up to 8 turbines in the very north of the GDL, this visibility does not impact any key</p>
LB7826	Castle Leod	Category A Listed Building	0	5.2	Southeast	

Designation Reference	Designation Title	Designation Type	Predicted Visibility (ZTV – number of turbines)	Distance in km	Direction from Site	Appraisal comments
						<p>approaches of views within the GDL. It is not anticipated that the Proposed Development would impact the ability to appreciate, understand, or experience the assets.</p> <p>Therefore, both Castle Leod and the associated GDL are scoped out of further assessment.</p>
GDL00370	The Spa Gardens, Strathpeffer	Inventoried Garden and Designed Landscape	0	5.8	Southeast	<p>Due to the asset falling outwith the ZTV, it is currently scoped out of further assessment. In addition, the Proposed Development is not anticipated to impact any key approaches towards or through the asset, or impact any factors which contribute to the asset's significance.</p>
GDL00068	Brahan	Garden and Designed Landscape	0	9.6	Southeast	<p>Due to the asset falling outwith the ZTV, it is currently scoped out of further assessment. In addition, the Proposed Development is not anticipated to impact any key approaches towards or through the asset, or impact any factors which contribute to the asset's significance.</p>

Designation Reference	Designation Title	Designation Type	Predicted Visibility (ZTV – number of turbines)	Distance in km	Direction from Site	Appraisal comments
GDL00174	Fairburn	Inventoried Garden and Designed Landscape	14	9.2	South	Scoped in
LB14030	Fairburn Tower	Category A Listed Building	14	9.9	Southeast	
LB1769	Coul House	Category A Listed Building	10	5.9	Southeast	<p>The asset is an early 19th century villa. The asset’s approach is from a drive from the west of the asset, coming from the village of Contin and entering the estate grounds around on the northwest border. The setting of the asset comprises grounds of lawns, pathways, tree lines and gardens spanning c.350m east, c.160m south and c.135m west, thick tree bands on the north of the estates boundary to the north, east and west and outbuildings associated with the estate to the south and southeast including the Mains of Coul (LB1771). The setting of the asset is limited to these grounds and isolated by purposefully lined trees and copses.</p> <p>The ZTV analysis indicates that 10 turbines would be potentially visible from the asset. Any visibility of the turbines would not impact the way in which the aspects of the assets setting</p>

Designation Reference	Designation Title	Designation Type	Predicted Visibility (ZTV – number of turbines)	Distance in km	Direction from Site	Appraisal comments
						contribute to its significance, nor would it affect the ability to understand, appreciate and experience the asset, therefore the asset is excluded from further assessment.
LB1789	Old Bridge, Contin	Category A Listed Building	14	5.4	Southeast	<p>The asset is located at Black Water over which it was constructed as part of famed engineer Thomas Telford’s work with the Scottish Commissioners of Highland Bridges and Roads, which aimed to inspect and improve infrastructure in the north of Scotland. Whilst the asset’s setting is Black Water, its setting does not contribute to the asset’s significance. Instead, its significance is primarily derived from its well preserved nature, architectural interest, and historic connection to Telford.</p> <p>The ZTV analysis indicates that all 14 turbines have potential to be visibility from the asset. Any visibility of the turbines would cause no impacts upon the ability to experience, understand or appreciate the factors which contribute to the assets significance. Therefore it has</p>

Designation Reference	Designation Title	Designation Type	Predicted Visibility (ZTV – number of turbines)	Distance in km	Direction from Site	Appraisal comments
						been excluded from further assessment.