

Coille Linne Wind Farm

Environmental Impact Assessment Report Volume 1 Chapter 1: Introduction

May 2025

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1 INTRODUCTION

Introduction

- 1.1 This Environmental Impact Assessment Report (EIA Report) is being submitted in support of an application by Energiekontor UK Ltd (the Applicant) for consent under Section 36 of The Electricity Act 1989 to install and operate a wind farm comprising 15 turbines and associated infrastructure on land approximately 21.9km north of Lairg and 16km south-east of Altnaharra ('the proposed development').
- 1.2 As the proposed development has a generating capacity exceeding 50MW, consent is provided under Section 36 of the Electricity Act 1989 however deemed planning consent would also be awarded under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 (as amended). The Applicant in this instance requests that there is a ten-year consent implementation period (instead of the usual three).
- 1.3 The site location is contained within Figure 1.1, and full description of the proposed development is contained within Chapter 3: Project Description. For the purposes of this EIA Report, candidate turbines of 250m to blade tip have been assessed which would provide an associated capacity of approximately 108MW with an additional 5MW of battery storage capacity.
- 1.4 The approach to EIA Methodology can be understood within Chapter 2 of this Volume, whilst the Design Evolution of the proposed development is contained within Chapter 4. The planning and renewable energy policy context continues to evolve, and a current snapshot is provided within Chapter 5, with an analysis of the planning and policy compliance kept separate to this EIA Report, within a standalone Planning Statement.
- 1.5 This chapter sets out details with regards to the Applicant, the aims of this EIA Report, its structure, and the brief context to the rest of its content.

The Applicant – Energiekontor UK Ltd

- 1.6 Energiekontor UK Ltd (EK) is a renewable energy development company, formed in 1999.
- 1.7 It develops small to medium-sized onshore wind and solar farms throughout the United Kingdom. The company operates seven existing wind farms in the UK and has obtained planning consent for a further five projects. Energiekontor also has several other wind and solar projects at various stages of the development process throughout the UK.
- 1.8 Energiekontor UK Ltd is part of the Energiekontor Group. The parent company, Energiekontor AG, was established in 1990 in Bremerhaven in Northern Germany. It has since grown to become one of the leading wind energy companies in Europe and is active in Germany, France, Portugal, the USA, and the UK. The company has obtained consent and built 118 onshore wind farms in Europe and commenced construction of the first 'no-subsidy' wind farm in the UK, Withernwick II in East Riding, Yorkshire.

Purpose of the EIA Report

- 1.9 The EIA Report includes a description of the Proposed Development, the location of the development, and its design evolution; summarises the findings of a comprehensive study of potential environmental effects; and, where adverse effects are identified, measures to avoid, reduce, or remedy such effects are described. At the time of the assessment for the proposed development, the EIA Report considers the likely significant effects (both beneficial and adverse) on the environment, identified in the EIA, during the construction, operational and decommissioning phases. In addition, any likely significant cumulative effects with other developments have also been considered within this EIA Report.

Structure of the EIA Report

- 1.10 The EIA Report for the proposed development is presented in the following volumes:
- Volume 1: Main Text, comprising Chapters 1 – 15, contain the main environmental assessment text and provides an assessment of the likely significant effects as per the requirements of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 ('the EIA Regulations');
 - Volume 2: Figures, containing the primary graphics, maps, drawings, and illustrations to accompany Volume 1;
 - Volume 3: NatureScot Visualisations consist of the visualisations prepared to NatureScot guidance and provided for visual assessment to accompany Chapter 6: Landscape and Visual and Chapter 7: Cultural Heritage;
 - Volume 4: Technical Appendices present a volume of appendices to complement Volume 1, including technical reports, supplementary assessments, and results of fieldwork; and
 - Volume 5: THC Visualisations consist of the visualisations prepared in line with THC methodology and provided for visual assessment to accompany Chapter 6: Landscape and Visual and Chapter 7: Cultural Heritage.
- 1.11 The EIA Report should also be read in context with the following standalone documents:
- EIA Non-Technical Summary (NTS) which summarises the main findings of the EIA Report in accessible language;
 - Planning Statement, which provides an assessment of policy compliance in relation to the Development Plan and other important material policy considerations;
 - Pre-Application Consultation Report (PAC Report) which sets out the approach and results of public engagement; and
 - Design and Access Statement (DAS) which illustrates the approach to design and access.
- 1.12 Volume 1 of the EIA Report contains the following introductory and technical chapters:
- Chapter 1: Introduction
 - Chapter 2: EIA Methodology
 - Chapter 3: Project Description

- Chapter 4: Design Evolution
- Chapter 5: Renewable Energy and Planning Policy
- Chapter 6: Landscape and Visual
- Chapter 7: Cultural Heritage
- Chapter 8: Ecology
- Chapter 9: Ornithology
- Chapter 10: Geology, Hydrology and Peat
- Chapter 11: Noise
- Chapter 12: Traffic and Transport
- Chapter 13: Socio-economics and Tourism
- Chapter 14: Forestry
- Chapter 15: Other Issues
- Chapter 15: Schedule of Mitigation

The EIA Team

- 1.13 The EIA Report has been compiled by Energiekontor however sub-consultants have carried out the assessment of specialist topics and provided input into the EIA. The members of the EIA Team and their associated roles are set out within Table 1.1.

Table 1.1: EIA Project Team

Chapter Number	Topic	Organisation
1 - 5	Introduction EIA Methodology Project Description Design Evolution Renewable Energy and Planning Policy	Energiekontor UK Ltd
6	Landscape and Visual	Pegasus
7	Cultural Heritage	Pegasus
8	Geology, Hydrology and Peat	RPS
9	Ecology	Wildlife Consulting
10	Ornithology	Wildlife Consulting
11	Noise	Greencat Renewables
12	Traffic and Transport	Pell Frsichmann
13	Socio-economics and Tourism	WSP
14	Forestry	McKay Forestry Ltd
15	Other Issues	Energiekontor UK Ltd
16	Schedule of Mitigation	Energiekontor UK Ltd

1.14 Regulation 5 (5) (a-b) of the Regulations states:

*“In order to ensure the completeness and quality of the EIA report—
(a)the developer must ensure that the EIA report is prepared by competent experts; and
(b)the EIA report must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts.”*

The Proposed Development

1.15 The Proposed Development, illustrated in EIAR Volume 2, Figure 3.1, is fully described within Chapter 3: Project Description, however a summary is provided below:

- 15 turbines;
- Associated turbine compound areas including foundations and hardstanding areas for erecting cranes at each turbine location;
- On-site tracks connecting each turbine;
- Upgrade of existing forestry track;
- Two new watercourse crossings and eight upgraded watercourse crossings , as set out in EIA Report Volume 4, Technical Appendix 10.1;
- An energy storage compound to store batteries with a 5MW capacity which would be within the construction compound footprint;
- Underground cables linking the turbines to the substation;
- Up to three borrow pit search areas for the extraction of stone on-site (indicated on Figure 3.1 as borrow pit search areas);
- A temporary construction compound including provision for onsite concrete batching; and
- An on-site substation to provide a grid connection;
- Outline Habitat Management provisions as proposed within EIA Report Volume 4, Technical Appendix 8.3.

1.16 The application boundary is set out on Figures 1.1a and 1.1b. Figure 1.1a is referred to as 'the Site' and occupies approximately 661.8 hectares (ha) whilst Figure 1.1b sets out the access boundaries required to facilitate the delivery of abnormal loads.

Scoping

1.17 Pursuant to the provisions of Section 12 of the EIA Regulations, the Applicant submitted a request for a Scoping Opinion from the ECU on 25th June 2024 (Ref: ECU00005163). The Scoping report was submitted under the name 'Fiag Wind Farm' however following consultation with the community, the name was changed to Coille Linne Wind Farm following feedback from the local community.

1.18 This request was accompanied by an EIA Scoping Report which set out a description of the location of the development, the nature and purpose of the development and its likely significant effects on the environment.

- 1.19 A Scoping Opinion was received from Scottish Ministers in September 2024. Details on comments raised by consultees and how they have been addressed within the EIA are set out within Chapters 6 – 15.

Contacts for Further Information and Consultation

- 1.20 In line with Part 4 of The Electricity (Applications for Consent) Regulations 1990, notification of the application for consent under section 36 will be placed in the following publications:

- One or more local newspapers circulating in the locality in which the land to which the application relates is situated (for two successive weeks);
- The Edinburgh Gazette, and;
- One or more national newspapers.

- 1.21 Hard copies of the EIA Report can be viewed at the following locations and times:

Table 1.2: Hard Copy Viewing Location and Opening Times

Lairg Library, The Main St, Lairg IV27 4DD ¹	
Monday	10:00 – 14:00
Tuesday	12:00 – 15:30, 16:00 – 19:00
Wednesday	Closed
Thursday	10:00 – 14:00
Friday	12:00 – 15:00
Saturday	Closed
Sunday	Closed

- 1.22 Copies of the full EIA Report and its associated standalone documents can be found on the Energy Consents Unit website by searching for Coille Linne Wind Farm. In addition, updates including a link to the case file are provided at the following web address: <https://energiekontor.co.uk/our-projects/coillelinne-wind-farm>
- 1.23 Alternatively, the Project Manager can be contacted for copies, as appropriate. There is no charge for provision of electronic documents or hard copies of the Non-Technical Summary on request.
- 1.24 Full printed copies can also be requested. Due to the size and cost of printed documents, charges for these are as follows:
- Volume 1 – Main Text: £50
 - Volume 2 - Figures: £300
 - Volume 3 – NatureScot Visualisations: £500
 - Volume 4 – Technical Appendices: £200
 - Volume 5 – THC Visualisations: £500

¹ <https://www.hIGHLIFEhighland.com/libraries/lairg-library/>

- 1.25 Requests should be made to Calum Morris, Project Manager, Energiekontor UK Ltd, calum.morris@energiekontor.com
- 1.26 Any representations to the application may be submitted:
- via the Energy Consents Unit website at: www.energyconsents.scot/Register.aspx;
 - by email to the Scottish Government Energy Consents Unit mailbox at representations@gov.scot; or
 - by post to the Scottish Government, Energy Consents Unit, 4th Floor, 5 Atlantic Quay, 150 Broomielaw, Glasgow, G2 8LU.

Coille Linne Wind Farm

Environmental Impact Assessment Report Volume 1 Chapter 2: EIA Methodology

May 2025

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2 EIA METHODOLOGY

Introduction

2.1 This chapter of the Environmental Impact Assessment Report (EIA Report) provides a detailed account of the Environmental Impact Assessment (EIA) methodology. The following key information is included:

- Description of the EIA process;
- Approach taken to the assessment of the Proposed Development and the technical studies undertaken;
- Approach to determining scale and significance of effects, and the basis upon which predictions were made (e.g., professional knowledge and judgment, initial studies, desktop exercises, preliminary survey work); and
- Guidelines, methods, and techniques used in the process of determining significance of effects;
- Subject specific methodology is outlined in each of the technical chapters; Chapters 6 through to 14.

EIA Process

2.2 EIA involves the compilation, evaluation, and presentation of any potentially significant (both positive and negative) environmental effects resulting from a proposed development, to assist the decision-making authority (in this case the Scottish Ministers via the Energy Consents Unit) when considering and determining an application. Early identification of potentially adverse environmental effects also leads to the identification and incorporation of appropriate mitigation measures into the project design to avoid, reduce, and if possible, remedy identified significant adverse environmental effects.

2.3 The main activities in the EIA process can be summarised as follows:

- Definition of the project to be assessed;
- Description of the 'baseline' environment (i.e., the conditions that are likely to prevail before commencement of the project);
- Definition of the scope of the assessment;
- Scoping and consultation with interested parties;
- Optimisation of the Proposed Development based on consultation and design;
- Prediction of the likely environmental effects of the Proposed Development;
- Evaluation of these effects in terms of their likely significance;
- Description of the nature and effectiveness of measures / design evolution which could be adopted in order to mitigate likely significant adverse effects, and the way in which these measures are to be monitored to measure effectiveness;
- Identification of residual effects;
- Submission of EIA Report and publicity;

- Review of adequacy of environmental information by Energy Consents Unit, The Highland Council, and statutory consultees; and
- Determination of application based on the EIA Report content and other relevant documentation supporting the application.

2.4 The information that a developer is required to submit as part of the EIA process is specified in Regulation 5 and Schedule 4 of the EIA Regulations, and includes at least:

- A description of the development comprising information on the site, design, size, and other relevant features of the development;
- A description of the likely significant effects of the development on the environment;
- A description of the features of the development and any measures envisaged in order to avoid, prevent, or reduce and, if possible, offset likely significant adverse effects on the environment;
- A description of the reasonable alternatives studied by the developer, which are relevant to the development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment;
- A non-technical summary of the above information; and
- Any other information specified in schedule 4 relevant to the specific characteristics of the development and to the environmental features likely to be affected.

2.5 Regulation 5 states that in order to ensure the completeness and quality of the EIA Report,

“(a) the developer must ensure that the EIA report is prepared by competent experts; and

(b) the EIA report must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts.”

2.6 A statement of competency, setting out the qualifications and experience of the lead EIA Report coordinators/chapter authors is provided in Chapter 1, and Chapters 6 to 14.

2.7 The scoping, preparation and production of this EIA Report has been conducted in accordance with the latest Government Regulations and published good practice guidance including:

- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
- Planning Circular 1/2017: Environmental Impact Assessment Regulations 2017;
- Environmental Impact Assessment Guide to Delivering Quality Development (Institute of Environmental Management and Assessment, 2016);
- Delivering Proportionate EIA (Institute of Environmental Management and Assessment, 2017) and;
- A handbook on environmental impact assessment: Guidance for Competent Authorities, Consultees and others involved in the Environmental Impact Assessment Process in Scotland, Version 5 (Scottish Natural Heritage and Historic Environment Scotland, 2018)

Approach to Technical Studies Undertaken

- 2.8 The EIA studies commenced at an early stage in the evolution of the Proposed Development. At the outset, with the objective of avoiding or minimising potential environmental effects, the findings of these baseline environmental studies played an important role in the design evolution of the Proposed Development (further details are contained within Chapter 4: Design Evolution). These studies defined the environmental sensitivities and constraints associated with the Proposed Development, the Site, and its surroundings.
- 2.9 The technical EIA studies have been undertaken in accordance with relevant guidelines and procedures. The majority of this guidance is specific to EIA topics and is therefore referenced within the individual assessment chapters, as necessary.
- 2.10 The majority of assessments involved consultations with statutory and non-statutory bodies, desk-based research, site inspections and surveys, impact prediction and input of mitigation to the design, where appropriate.
- 2.11 The content and conclusions of the EIA Report, which includes a clear, reasoned description of any likely significant adverse or beneficial effects of the Proposed Development, are based on a comprehensive assessment undertaken with all information available at the time of writing. Further details of the structure and content of the EIA Report assessment chapters is presented below.

Structure of EIA Report Technical Chapters

- 2.12 Each technical EIA Report chapter follows the sub-heading structure set out below where possible to ensure that the final document is transparent, consistent, and accessible:
- Introduction and overview;
 - Legislation (where relevant), Policy and Guidance;
 - Stakeholder Consultation (where relevant);
 - Assessment Methodology and Significance Criteria;
 - Baseline Conditions;
 - Identification and Evaluation of Key Effects;
 - Cumulative Effects and Interaction of Effects;
 - Mitigation Measures and Monitoring;
 - Residual Effects;
 - Summary;
 - References; and
 - Each chapter sub-heading is explained in further detail below.

Introduction and Overview

- 2.13 This introduces the assessment discipline and explains its purpose in the context of the Proposed Development, the nature of receptors to be considered, and how the Proposed Development might cause changes to baseline conditions.

- 2.14 The introduction includes a statement of competence from the author of the chapter.

Legislation, Policy, and Guidance

- 2.15 This section includes a brief summary of policies of relevance to the environmental discipline and assessment. Where applicable, relevant legislation and assessment guidance is summarised.

Consultation

- 2.16 A wide range of stakeholders have been consulted on the Proposed Development, and the feedback received has been incorporated into the iterative design process described in Chapter 4: Design Evolution. Further information can be found in the relevant chapters.

Assessment Methodology & Significance Criteria

- 2.17 This section provides an explanation of the methods used in undertaking the assessment with reference to published standards, guidance, and best practice.
- 2.18 The application of significance criteria used is discussed within this section.
- 2.19 Assessment limitations are also set out within this section.

Baseline Conditions

- 2.20 This section includes the following:
- a description of the environment as it currently is and as it is expected to change if the Proposed Development were not to proceed (i.e., 'do-nothing' scenario);
 - baseline conditions set in context and that of the surroundings of the particular subject area to be affected; and
 - A description addressing the projected climate change and how likely the baseline is to change as a consequence of climate change.

Identification and Evaluation of Key Effects

- 2.21 The candidate turbine is set out within the Chapter 3: Project Description. The turbine and associated infrastructure requirements have been used as a candidate in the assessments. The final turbine chosen will be dependent upon what is available within the maximum parameters assessed in the EIA Report.
- 2.22 The EIA Regulations require consideration, throughout assessments, of all likely significant environmental effects; direct / indirect; secondary; cumulative; positive / negative; short / medium / long-term; or permanent / temporary. In terms of how likely these potential significant environmental effects are to arise; the following is considered:
- Direct effects are readily identified because of the physical connection between some element of the Proposed Development and an affected receptor;

- Indirect effects require some additional pathway for the effect to arise, for example, a listed building may not be directly affected by any elements of a development, but, if a proposed development changed the hydrology of the surrounding area, this may affect the archaeological preservation of the listed building, and therefore would be considered an indirect effect;
- Secondary effects would typically require pathway connections, for example, an effect on receptor population A could have a secondary effect on receptor population B, if B was itself dependant on A in some way, as, for example, a food source; and
- Cumulative effects would be those that the Proposed Development may have in combination with other wind farms which are at application stage, consented, under construction or operational (i.e., the incremental effects resulting from the Proposed Development if all other wind farms are assumed to be constructed/operated). These are commonly known as 'inter' cumulative effects. Interrelated effects (otherwise known as 'intra' cumulative effects) are separate discrete effects which may interact and combine to affect a single receptor i.e., noise and dust.
- Likely significant environmental effects are considered in terms of their character, either beneficial (representing environmental gain) or adverse. There may also be cases where it is appropriate to identify the occurrence of change, but to note that the potential change is either neutral, and neither specifically beneficial nor adverse. The likelihood of the effect occurring is also considered, being unlikely, uncertain, or likely to occur.
- Likely significant environmental effects are also considered in terms of their duration. Effects can typically be:
 - Temporary – these effects are likely to last for a period of a few days to a few months; they will be related to a particular activity and will cease immediately or soon after the activity ceases;
 - Short-term – this would normally be considered to be between a period of a few months to a few years depending on the effect being discussed and the environment's ability to recover from an effect;
 - Long-term – this would typically be a period of between a few years and the life of the Proposed Development; and
 - Permanent – this would typically mean an effect resulting in an irreversible change in the environment.

2.23 It is important that levels of effect are clearly defined on the basis of their significance. The approach taken in this EIA Report emphasises the use of professional judgement within a structure that combines receptor sensitivity (or importance) with magnitude of change arising from the Proposed Development to define significance of effect.

2.24 The EIA Regulations recognise that developments will affect environmental elements to differing degrees and not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIA Regulations identify those environmental resources that warrant investigation as those that have 'potential to be significantly affected by the development (Schedule 4(4)). Those that are not deemed to have an effect can therefore be scoped out of the assessments.

- 2.25 The EIA Regulations do not define significance and it is, therefore, necessary to state how this will be defined for the Proposed Development. In certain circumstances it is possible for disciplines to use quantitative assessment methodology to predict effects / values that can be compared against published thresholds or indicative criteria. However, it is not always possible to use quantitative measurements/values and such some assessments rely on professional judgement, past experience or other evidence. This could be reference to the development description, available information about potential changes that are expected to be caused by the Proposed Development, and the receptors that may be affected.
- 2.26 Professional judgement (in combination with any published guidance) is used to assess the interaction of a receptor's sensitivity to change, and the magnitude of potential changes caused by the development to identify a level of effect. The Assessment methodology and Significance Criteria section within each Chapter provides an overview of how the assessment has been conducted for each discipline, and where any deviations from the methodology described above occurs.
- 2.27 For some of the topics that are assessed in this EIA Report there is published guidance about significance evaluation. Where such topic-specific guidance exists (even in draft) it will be used to inform the development of the significance evaluation methodologies used. For other topics, a **major or moderate** level of effect is generally of most importance to the decision-maker and these effects are considered **significant** in terms of the EIA Regulations. Where the level of effect is **minor or less**, these are generally **not significant** in terms of the EIA Regulations.
- 2.28 The temporal scope of the EIA will cover the period from commencement of the first phase of development (construction), through to operational phase (operation), up to the completion of operations and restoration of the Site (decommissioning). For ease of reporting the temporal scope will generally be considered in relation to the following key stages of the development:
- Construction – effects may arise from the construction activities themselves or from the temporary occupation of land. The effects are often temporary and of limited duration, although, there is the potential for construction activities to create permanent change;
 - Operation – effects are typically long-term (subject to any future decommissioning), though may also be related to operational emissions or effects that will stop if the operation stops; and
 - Decommissioning – effects may arise from the decommission activities themselves or from the temporary occupation of land. The effects would often be temporary and of limited duration and additional permanent change (unless associated with restoration) would normally be unlikely.
- 2.29 In its broadest sense, the spatial scope of an EIA is the area over which changes to the environment may occur as a consequence of the development. In practice, the EIA focuses on those areas where these changes may result in likely significant effects on the environment.

- 2.30 As such, the spatial scope varies between the environmental topics assessed. For example, effects upon the landscape resource and visual effects are assessed within a much larger zone from the site boundary when compared to ecological related effects.
- 2.31 As part of the application, a micro-siting allowance of 100m will be sought to allow all turbines and infrastructure to be moved within a 100m radius should ground conditions or other factors justify this. For completeness, each assessment has given consideration as to the likely effects of moving onsite infrastructure to this extent.

Cumulative Effects and Interaction of Effects

- 2.32 As required by the EIA Regulations, it is also important to consider the possible effects that a proposal may have in combination with existing, consented, or other proposed developments or activities. Likely cumulative effects have been defined as the likely effects that the Proposed Development may have in combination with other wind farms which are at application stage, consented, under construction or operational (i.e., the incremental effects resulting from the Proposed Development if all other wind farms are assumed to be constructed/operated).
- 2.33 Where relevant the approach to the cumulative effect assessments varies across technical disciplines and a rationale as to the scope of this assessment is provided in each chapter.
- 2.34 For the purposes of the EIA Report, the potential effects of the Proposed Development are considered in terms of effects on each of the discrete topic areas. In reality, topic areas such as ecology and hydrology are interrelated, and could combine to result in a significant effect on a given receptor. Schedule 4 of the EIA Regulations states that the EIA Report should include an assessment of *"the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development"*, and these are addressed within each of the EIA report chapters where relevant.

Mitigation Measures and Monitoring

- 2.35 There is much debate amongst practitioners and legal reviewers regarding pre-mitigation and post-mitigation assessments of effects. One crucial point of discussion is whether changes in design constitute mitigation or not. The approach taken here is that the pre-mitigation assessment of effects takes account of scheme design changes that relate to the number / location and scale of scheme elements, and it also takes account of the adoption of standard guidelines. The post-mitigation assessment takes further account of specific / additional controls on the method of construction or operation. In most cases these should only relate to circumstances where a potentially significant effect is being reduced.
- 2.36 The development of mitigation measures to avoid, reduce or compensate for significant adverse environmental effects of a project is an intrinsic part of the EIA process. These measures can relate to site construction or the completed development i.e., measures to be undertaken during the operation of the development through appropriate site management or through the introduction of specific design elements.

2.37 This section of the EIA Report chapter describes the measures which would be implemented to avoid or ameliorate likely adverse effects and enhance the likely beneficial effects of the Proposed Development.

2.38 In many cases mitigation measures are inherent within the Proposed Development (either through design or operation), whereby likely significant adverse effects are avoided. However, not all effects can be avoided and there are mitigation measures to reduce these. Standard good practice measures employed during construction, for example, may also be considered to provide in-built mitigation and this is stated in the topic assessments where relevant. Any further survey requirements and monitoring required to gauge the effectiveness of proposed mitigation measures will be included where relevant. In such instances, these are proposed within the relevant technical chapter.

Residual Effects

2.39 This section describes the remaining effects of the Proposed Development assuming implementation of the proposed mitigation measures.

References

2.40 This section provides a detailed record of all data sources consulted and guidance used to inform the assessment.

Coille Linne Wind Farm

Environmental Impact Assessment Report Volume 1 Chapter 3: Project Description

June 2025

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3 PROJECT DESCRIPTION

Introduction

- 3.1 This chapter provides an outline description of the Proposed Development, the Site, and its surroundings. Details of the construction, operational and decommissioning phases of the Proposed Development are also considered in this chapter.
- 3.2 Details of the iterative design process that resulted in the final design as set out in this chapter are detailed in Chapter 4 and describes the key considerations and constraints that have influenced the layout of the Proposed Development and the evolution of the design.
- 3.3 The Proposed Development will consist of the construction, 35-year operation and subsequent decommissioning of up to 15 wind turbines along with ancillary infrastructure as described within this chapter.

The Site and Its Surroundings

- 3.4 The application boundary is set out on Figures 1.1a and 1.1b. Figure 1.1a is referred to as 'the Site' and occupies approximately 661.8 hectares (ha) whilst Figure 1.1b sets out the access boundaries required to facilitate the delivery of abnormal loads.
- 3.5 The Site, also shown in EIAR Volume 2, Figure 3.1, is located approximately 21.9km north of Lairg and 16km south-east of Altnaharra and covers an area of approximately 661.8 hectares(ha) with the present land use comprising commercial coniferous forestry which is actively managed. The Site lies within the administrative boundary of the Highland Council.
- 3.6 The summit of Meall Odhar (285m AOD) forms the highest point within the Site with the topography declining towards the River Fiag in the east. The River Fiag partially forms the eastern boundary of the site and runs from north to south but is located outwith the Site boundary.
- 3.7 There are a number of unnamed watercourses across the site which run in a generally easterly direction and drain into the River Fiag. Continuing south, the River Fiag then drains into Loch Shin which lies approximately 1.2km from the Site boundary.
- 3.8 The Site is accessed from the A838 which lies immediately to the south of the Site. The A838 is a major road in Sutherland which runs generally northwest from the A836 in the Lairg area to Laxford Bridge on the west coast of Scotland.
- 3.9 There are no main settlements within 15km of the Site boundary and residences are limited to scattered properties clustered along the A838 with the closest property lying approximately 3km from the nearest proposed turbine.

- 3.10 Strath Duchally Site of Special Scientific Interest (SSSI) and the Caithness and Sutherland Peatlands SAC, SPA and RAMSAR designations lie within the north-western section of the Site boundary.
- 3.11 Strath Duchally SSSI forms part of the Caithness and Sutherland Peatlands Special Area of Conservation (SAC) and the Caithness and Sutherland Peatlands Special Protection Area (SPA) with the designation notified for the nationally important blanket bog habitat and breeding populations of dunlin, golden plover and greenshank. The Flow Country UNESCO World Heritage Site, inscribed in July 2024, is also within the boundary of the Caithness and Sutherland Peatlands designation. The area was nominated based the '*outstanding example of a blanket bog ecosystem*' and '*providing a globally significant natural habitat for an internationally important assemblage of specialist biodiversity*'¹. The Ben Klibreck SSSI also lies within 10km of the site.
- 3.12 The Site lies approximately 7.5km to the south-west of the Creag Riabhach (22 turbines, 125m to tip) and Creag Riabhach Extension Wind Farm (3 turbines, 149.9m to tip), approximately 4.5km to the north-east of the consented Sallachy Wind Farm (9 turbines, 149.9m to tip) and 5km north-west of the Shinness Wind Farm (16 turbines, 200m to tip) which is currently in the application stage.

Description of Proposed Development

- 3.13 The Proposed Development is illustrated on Figure 3.1 and would consist of the following principal components:
- 15 turbines;
 - Associated turbine compound areas including foundations and hardstanding areas for erecting cranes at each turbine location;
 - On-site tracks connecting each turbine;
 - Upgrade to existing bellmouth junction from the A838 (set out in Figure 12.5)
 - Upgrade of 4.93km of existing forestry track;
 - Two new watercourse crossings and eight upgraded watercourses, as set out in EIA Report Volume 4, Technical Appendix 10.1;
 - An energy storage compound to store batteries with a 5MW capacity which would be within the construction compound footprint;
 - Underground cables linking the turbines to the substation;
 - Up to three borrow pits for the extraction of stone on-site (indicated on Figure 3.1 as borrow pit search areas);
 - A temporary construction compound including provision for onsite concrete batching;
 - An on-site 132kV substation to provide a grid connection;
 - Forestry felling and restocking plans as set out in EIA Report Volume 1, Chapter 14: Forestry, and

¹ <https://whc.unesco.org/en/list/1722/documents/>

- Habitat Management provisions as proposed within EIA Report Volume 4, Technical Appendix 8.3
- 3.14 The Proposed Development would be time-limited to 35 years from the first date of final commission. The construction phase would last approximately 18 months, and decommissioning would last approximately six months.
- 3.15 Deemed planning permission is sought to permit a period of ten years between the date of the Decision Notice and expiry of consent (should works not be commenced) rather than the usual three years. This is to accommodate any potential grid delays.
- 3.16 The proposed development would provide approximately 108MW of installed capacity (depending on the turbine model chosen) in addition to 5MW of battery storage capacity. It is estimated by the Applicant that this installed capacity could generate approximately 396,358MWh of renewable electricity each year which would be expected to power the equivalent of approximately 114,488 homes on average each year², or provide 2.2 million full battery charges for electric vehicles per year³.
- 3.17 The planning application includes an allowance for micro-siting of the wind farm infrastructure. If planning permission is granted, the Applicant will commission detailed ground investigations and geotechnical surveys to determine the ground conditions. A 100m micro-siting allowance is sought for the wind turbines (with restrictions in place to safeguard constraint buffers as applicable), and all other new elements of the Proposed Development.
- 3.18 The construction and decommissioning of the wind turbines, ancillary equipment and on-site infrastructure are described in more detail in the following sections of this chapter and within Chapter 4: Design Evolution. The principal elements include:
- **Wind turbines** – 15 wind turbines (see Figure 3.2 for typical wind turbine elevations). The co-ordinates of the turbines are given in Table 3.1 below;
 - **Turbine foundations** – The foundations of the turbines could be either reinforced concrete gravity structures or piled foundations. This would be dependent on the ground and hydrological conditions at the turbine location which would also determine the overall size of the support structure. Typical foundations for the size of turbine proposed are shown in Figure 3.3;
 - **Site access** – The Site will be accessed via the A838. To reach the proposed access, the route will also travel along the A836, passing through to the Lairg, and the A839 which branches off from the A9 near The Mound.
 - **Crane hardstandings** – To provide a level and firm base for the cranes at the location of each turbine and would be surfaced with coarse aggregate. The dimensions and layout for a typical crane hardstanding layout are shown in Figure 3.7 and would occupy an area of approximately 0.93 hectares (ha), however this is dependent on the turbine model chosen;

² Based on an average annual UK domestic electricity consumption figure of 3,462KWh as set out in the BEIS publication "Energy Consumption in the UK" December 2023.

³ Based on a large electric vehicle requiring 180kWh for a full charge.

- **Site tracks** – A total of 6.01km new tracks to provide access for construction and maintenance vehicles from the Site access to the substation and wind turbines. These would be constructed at the commencement of the construction phase and would remain in-situ following decommissioning. They would have a running width of approximately 5m, the final width dependant on turbine supplier requirements. The tracks would feature local widening on corners and would be surfaced with coarse aggregate (see Figure 3.4 for typical track cross sections). Site tracks include new sections of track and upgrading of existing access tracks. New sections of track across areas of peat deeper than 1m would be floated, comprising a total of approximately 750m. Turning heads would also be required;
- **High voltage and control cables** – To form power and control circuits linking each turbine to the on-site substation, cables would be placed in trenches (dimensions to be determined by the ground conditions but typically 0.5m wide by 1m deep) routed alongside the tracks (see Figure 3.8 for typical cable trench construction details);
- **Borrow Pit Search Areas** – Areas identified as a source of material for the creation of other ground infrastructure. The borrow pit search area locations are identified in Figure 3.1;
- **Energy Storage Compound** - The energy storage equipment would be housed within ISO shipping containers with a 2.4m high palisade fence in a compound 17.5m by 32m. Battery containers will be positioned a minimum of 2.5m apart to facilitate access to all sides. Battery energy storage equipment will be factory assembled and delivered to site in standard 12.2m(l) x 2.4m(w) ISO shipping containers. A plan is presented as Figures 3.9. Figure 3.1 shows the construction compound area that this would be housed within;
- **Construction compound/storage area** – The compound to facilitate construction of the Proposed Development, which would also provide a storage area for plant and materials and is temporary during the construction phase (see Figure 3.6 for a typical compound design);
- **Substation / switchgear housing building** – A 90m x 90m space would be required for the construction of a 132kV substation (subject to a future planning application).

Wind Turbines

- 3.19 Turbines would be of tubular steel construction, finished in a typical off-white matt colour and comprise three blades. The final turbine choice would be made post-consent during the procurement phase, but for the purposes of this EIA Report, representative candidate turbines with a 162m rotor diameter have been used. Hub height and tip heights of the turbines are set out within Table 3.1.
- 3.20 Turbine co-ordinates, subject to a maximum of 100m micro-siting dependent upon localised constraints, are as follows within Table 3.1.

Table 3.1: Proposed Wind Turbine Coordinates (subject to a 100m micro-siting allowance)

Turbine	Easting	Northing	Tip Height (m)	Hub Height (m)
1	244618	925477	250	169
2	245231	925221	250	169

Turbine	Easting	Northing	Tip Height (m)	Hub Height (m)
3	244691	924974	250	169
4	245132	924730	250	169
5	244915	924134	250	169
6	245231	923675	250	169
7	245874	923674	250	169
8	245319	923120	250	169
9	246111	923189	250	169
10	245584	922610	250	169
11	246327	922692	250	169
12	245741	922137	250	169
13	246560	922141	250	169
14	245910	921660	250	169
15	246439	921474	250	169

- 3.21 To carry the power generated to the local electricity network, each turbine would require a transformer to step up to a high voltage. Transformers will be internal to the turbine.
- 3.22 Monitoring and controlling the performance of the wind turbines would be achieved by way of a sophisticated Supervisory Control and Data Acquisition (SCADA) system. The SCADA system would gather data from all the turbines and provide the facility to control them from a remote location. Communication cables connecting to each turbine would be buried in the electrical cable trenches to facilitate this.

Wind Turbine Foundations

- 3.23 The first task in constructing each wind turbine foundation would be to remove any mineral soil to the perimeter of the proposed foundation excavation. The underlying subsoil would then be excavated to the required foundation depth, normally by conventional construction equipment. Excavated materials would be set aside for re-use as backfill around the foundation following completion of construction. Detailed method statements for materials handling would be prepared in accordance with conditions imposed by The Highland Council (THC) on the granting of a planning consent.
- 3.24 The foundation formation would then be prepared to receive concrete blinding by placing timber shuttering around the edge of the excavation. Concrete blinding would be poured on the foundation formation to level the area in preparation for fixing the steel reinforcement bars. The blinding would be a weak mix of concrete with low slump and would normally be placed fairly dry. Little if any loss of cement would therefore occur during placement of the lean-mix levelling layer.
- 3.25 A bottom mat of reinforcement would be placed on the weak mix concrete blinding. Additional reinforcement would be fixed to the bottom mat to form the main reinforcement cage for the foundation. Starter bars would then be fixed to the main cage

to form the up stand, which would support the bottom tower section. Temporary shuttering would be placed on the reinforcement cage to ensure that there would be sufficient concrete cover to the top layer of steel. Side shuttering would also be positioned around the cage to form the sides of the concrete slab and to prevent loss of concrete and cement paste into the ground.

- 3.26 Concrete would then be poured to form the main slab either by a concrete pump or by being placed in small hoppers / skips that would be lifted over the area being concreted and then tipped. Conventional concrete lorries of approximately 8m³ capacity would be used for each foundation. During the pour, the concrete would be compacted using poker vibrators. As the concrete placements are completed, the temporary shuttering on the top steel would be removed, and the concrete tamped and floated to a smooth finish.
- 3.27 A curing compound is often used to stop the concrete drying out too quickly (which can lead to hairline cracking of the top surface). This is sprayed onto the surface concrete. Plastic sheeting or hessian may also be used to assist with curing of the concrete if considered appropriate. This reduces evaporation of water at the surface of the concrete and assists in preventing shrinkage of cracking material.

Wind Turbine Delivery and Erection

- 3.28 The Site will be accessed via the A838. To reach the proposed access, the route will also travel along the A836, passing through to the Lairg, and the A839 which branches off from the A9 near The Mound. Delivery of the turbine components would be undertaken by specialist contractors using purpose-built vehicles, as described in more detail in Chapter 12: Traffic and Transport.
- 3.29 Mechanical installation would comprise the delivery and erection of turbine components at the turbine locations. Erection of the turbine components is normally undertaken by the turbine supplier using specialist heavy lifting subcontractors and cranes.
- 3.30 The connection of the tower to the foundation would be made by using holding down bolts or with a short cylindrical steel section embedded in the foundation slab. The choice of holding down system would depend on the wind turbine supplier. The sequence of construction of the connection between the tower and foundation depends on which system is used.
- 3.31 For a holding down bolt solution, the upstand foundation anchor bolt assembly would be placed, along with additional reinforcement in the upstand following completion of the base slab. At this stage, partial backfilling of the foundation would be undertaken to aid access to the turbine location during the rest of the foundation construction. Once the upstand reinforcement and anchor bolt assembly are complete, timber or steel shutters would be placed to form the upstand of the turbine foundation.
- 3.32 If the tower is connected to the foundation by a steel cylindrical section, then the upstand reinforcement and holding down bolts would not be required. For this holding down solution, there would be only one phase of concrete pour because the embedded section would form a permanent shuttering for the mass concrete inside it.

- 3.33 Electrical ducts would then be placed through the shuttering and reinforcement (for the holding down bolt solution), or the steel cylinder. These would include conduits for the high and low voltage cables and earthing tapes. The configuration of the ducts and the earthing tape would depend on the turbine model being used and the nature of the electrical layouts. The holding down bolts are held in place within the shuttering by a template which would be fixed to the shuttering. Concrete would then be poured to form the foundation upstand. The upstand concrete would be compacted with poker vibrators in a similar way to that described for the base slab.
- 3.34 The wind turbine earthing ring and tails would then be placed within the backfill. In some cases, earthing rods would be needed around the foundations. The need for these would depend on the ground conditions at the Site. If required, they would be installed as self-boring rods, drilled into the ground, in contact with the weathered rock. The depth of the rods would depend on the electrical characteristics of the ground. Once the earthing ring is completed, the cable ducts would be extended to the edge of the foundation and backfilling to the top of the upstand would commence.
- 3.35 The wind turbine foundation would then be backfilled. Weathered rock material from the foundation excavation would be used for the bulk of the backfill. It would then be placed in thin layers and compacted mechanically.
- 3.36 The bottom section of the wind turbine tower would be placed over the foundation bolts and fixed to the foundation. Cementitious grout would be placed between the bottom flange of the tower and the foundation. The grout would be retained in position by temporary formwork, which would prevent it from spilling outside the foundation. The material would be allowed to cure, and the nuts would be tightened to pre-tension the bolts.
- 3.37 The area around each turbine tower and over the turbine foundations would be reinstated by using topsoil stripped during the foundation construction excavation and other surplus excavated material.

Wind Turbine Transformers

- 3.38 In order to carry the power generated to the local electricity network each turbine would require a transformer to step up to a high voltage. Turbine transformers can either be located within the nacelle, within the turbine tower or adjacent to the base of each tower, depending on the wind turbine model selected and the supplier's specification.

Crane Hardstandings and Outrigger Pads

- 3.39 At the location of each turbine foundation, a hardstanding would be constructed to provide support for the cranes used for turbine erection. These hardstandings could also be used for storing turbine components, such as the nacelle, until they are installed. When not being used for turbine erection, the crane hardstanding may also be used as passing places at each turbine location where appropriate.

- 3.40 The size of turbines proposed for this project would normally require the use of a main crane of up to 1,000 tonnes capacity. A smaller tail crane would also be used to aid lifting of the larger components.
- 3.41 The layout of the hardstandings for this project is shown on Figure 3.7. Each hardstanding would cover an area of approximately 240m long and 78m wide⁴, although dimensions may vary with turbine selection and manufacturer requirements.
- 3.42 The hardstandings would be constructed using the same criteria and methods as those used for the site tracks. The thickness of stone fills in these areas is normally similar to the site track construction but may be increased due to the axle loading from the cranes. This would depend on the characteristics of the vehicles used for the erection of the turbines.
- 3.43 The precise design of the crane hardstandings would be determined by the ground conditions at the turbine locations in a similar way to the design of the site tracks described above. The crane hardstanding would be of cut design.
- 3.44 On completion of construction, the hardstanding areas at each turbine location would be retained but allowed to re-vegetate naturally. Their retention is so that they are available for use in the event of a major component replacement during the operation of the wind farm and for decommissioning.

Site Tracks

- 3.45 In summary, the Proposed Development requires approximately 6.01km of new tracks, which comprises:
- The construction of approximately 5.26km of new cut track
 - The construction of approximately 750m of new floating track.
- 3.46 As part of the proposed development, two access routes to T15 are included. It is likely that only one route will be progressed however for the purposes of the EIA Report, an assessment has been carried out on both options to fully assess the alternatives.
- Option 1: 5.29km
 - Utilises the existing forestry track
 - Option 2: 5.92km
 - Utilises a bypass road to connect to the T15 crane pad
- 3.47 The proposed development will also utilise the existing forestry tracks which has a maximum length of 5.68km. However, only 4.93km of the existing track will be used for the proposed development and upgrading works may be required to facilitate turbine delivery.
- 3.48 Where new sections of access track are required, whether cut or floating, these would have a running surface of approximately 6m with local widening at bends. The actual running width would be dependent on eventual turbine selection and manufacturer requirements. The routing of new access tracks has also been designed to minimise track

⁴ Both measurements are taken from the maximum extents

length, reduce impacts upon the native woodland plantation and to avoid environmental and technical constraints such as watercourse crossings and critical slope angles where practical to do so.

- 3.49 The construction of new cut tracks would involve the stripping and storage of topsoil and peat deposits. Geotextile membranes would only be installed if required. Mineral soil and subsoil excavated during cut track construction would be set aside for re-use in site reinstatement at a later date. The crushed stone track would be laid to a nominal depth of up to 450mm and aggregates required for the access tracks would be obtained from the on-site borrow pits as well as local suppliers. The tracks would incorporate swales to attenuate surface water flow in accordance with sustainable drainage principles.
- 3.50 All surface drainage will be controlled with regards to surface flow and sediment to ensure no untreated discharge to watercourses, even under heavy rain conditions. All drainage management mitigation will be carefully monitored daily by the Environmental Clerk of Works and suitably trained site staff.
- 3.51 In order to prevent any fine, in-situ clayey, subsoil material from migrating into the free draining granular fill of the site track, a geotextile layer may need to be laid on the underlying subsoil beneath the site tracks. The fill would be placed to a depth corresponding approximately to the original ground level. This would be levelled and compacted by compaction equipment and by the construction traffic that uses the track for access to the various parts of the Site.
- 3.52 Cross drains would be designed to divert the water at various points along the track alignment and to transmit it underneath the track. As far as is practicably possible, any water collected would be re-distributed to replicate the original surface / sub-surface flows.
- 3.53 On completion of construction, the remaining excavated mineral soil and subsoil would be levelled alongside the access tracks. A typical new track cross section is shown on Figure 3.4.
- 3.54 Micrositing of 100m is sought for tracks as well as turbine positions in order to optimise post-Ground Investigation design and avoid any unforeseen constraints and minimise cut and fill.

Floating Tracks

- 3.55 Where new tracks are proposed across areas of peat deeper than 1m, floating construction techniques would be used. Generally, the process would incorporate an approximately 7m to 8m wide strip of geogrid laid on the surface of the turf. A layer of approximately 700mm to 1000mm of crushed stone would then be laid on the geogrid to form the track, with the edges of the track forming steep batter slopes raised above the soft surface. The track would incorporate an upper layer of approximately 250mm hard-wearing rock and the geogrid system, which would be designed for floating road construction, would aim to limit the potential for tracks to penetrate the ground.

- 3.56 The access tracks would be retained throughout the operational life of the Proposed Development to enable maintenance of the turbines.

Watercourse Crossings

- 3.57 A total of two new watercourse crossings will be required as part of the construction of the site tracks with a further eight existing watercourse crossings on site that may require upgrading. EIA Report Volume 4, Technical Appendix 10.1 sets out a watercourse crossing inventory where requirements for each crossing are discussed in detail whilst Figure 3.5 sets out a typical watercourse crossing.

High Voltage Cabling

- 3.58 The turbines would be interconnected using armoured underground cables placed in trenches forming a power circuit within the Site. The underground cables would be taken into the on-site substation where the electrical control equipment would interface with the local distribution network.
- 3.59 The design of the high voltage (HV) cable trenches would be a function of the electrical rating of the cables, the ground conditions and the depth of protection required for the cables. The electrical rating and the ground conditions would provide data to assess the thermal performance of the cables. This would determine the likely spacing between each electrical circuit and therefore the width of the trench. Typical cable trench construction details are shown in Figure 3.8.
- 3.60 Cable trenches would be excavated using conventional construction equipment. The mineral soil would be dug out and set aside for re-use in the reinstatement of the trenches. The trench would then be excavated to the required overall depth. Subsoil material from the excavation would be temporarily stockpiled alongside the trench but kept separate from any mineral soil. Detailed method statements for materials handling would be prepared in accordance with a restoration and management plan.
- 3.61 The cable would be placed on a bed of previously dug stone free excavated soil material. The trench would then be backfilled with excavated subsoil taken from the temporary stockpile alongside the trench and the top of the excavation reinstated with topsoil. Cable tiles or a warning marker tape would be laid in the trench during backfilling at a pre-specified depth. Any surplus excavated material would be stockpiled at an agreed location and used later in the reinstatement of the Site.

Borrow Pits and Concrete Requirements

- 3.62 Up to three borrow pits would be utilised as a source of aggregate for the construction of the Proposed Development infrastructure, including access tracks, hardstandings, turbine foundations etc. The final location of the three borrow pits within the search areas (shown in Figure 3.1) will be confirmed following final geological investigation.

Energy Storage Compound

- 3.63 Prior to the commissioning of the wind turbines activities the Energy Storage Compound will be constructed using the western side of the temporary construction compound. Figure 3.9 shows a typical energy storage compound plan.
- 3.64 Battery energy storage compound would be factory assembled and delivered to site in standard 12.2m long x 2.4m wide ISO shipping containers. Each container will be positioned on cast in-situ concrete foundations of approximately 1m² area, located at each corner of the container and centrally. The level of the foundations will be finished approximately 100mm above finished ground level to assist with drainage and air flow beneath the shipping container.
- 3.65 Battery containers will be positioned a minimum of 2.5m apart to facilitate access to all sides. Dependent upon design and manufacturer's requirements, access may be necessary from the sides of containers as well as from each end. Each container would house batteries with an energy density range of 1MWh – 3MWh.
- 3.66 A Power Conversion System (PCS) container, of similar dimensions to the battery containers, would be located adjacent to each battery storage container. The contents of the container would be factory assembled and tested. Foundations for PCS containers would be similar to the battery containers. A transformer, located either within the PCS container or externally, would transform the LV to EHV or HV voltages depending on the voltage of the point of connection to the local network, or vice versa. The battery and PCS containers would be connected via underground cables. If the unit transformer is located externally, underground cables will connect the PCS and transformer. Underground cables would take power to and from the proposed wind farm control building.
- 3.67 Switchgear, communications, and protection equipment would be located within the proposed wind farm control building, located to the east. The battery containers, PCS and transformer(s) will be located within a secure compound fenced with steel palisade fencing 2.4m high. A standard double width gate would facilitate personnel and vehicle access into the compound. The compound would be surfaced with crushed aggregate, suitably compacted in layers, and incorporating geotextile / geomembrane where necessary. The depth of the aggregate will be dependent upon the underlying geology and suitable to support all anticipated loadings with minimal deflection / rutting.

Construction Compound/ Storage Area

- 3.68 The construction compound, as shown in Figure 3.6, would be installed as soon as possible at the start of the construction phase, which would be the hub of construction operations.
- 3.69 The construction compound would be approximately 40 x 45m and incorporated into a total area of 100m by 50m; the remaining space being used for overnight storage of plant vehicles and general storage. The indicative location, shown in Figure 3.1, takes account of the local terrain and its distance from watercourses, and further survey works would examine the efficacy of this location.

- 3.70 Space would be provided for 'portacabin' style site offices; welfare and mess facilities; secure containers for tool and equipment storage; an area for the storage of various materials and small components with bunding as required; and car parking areas. The compound would be secured by means of a perimeter fence and lockable gates if deemed necessary.
- 3.71 On completion of construction, the site compound would be removed, and the area reinstated to its former condition in accordance with an approved method statement.

Site Substation

- 3.72 The proposed development will potentially require a 90m by 90m, 132kV substation compound, as depicted in Figure 3.1. Within this there would be a requirement for a wind farm substation compound of 45m by 20m, with a separate compound belonging to SSE Networks which would be provided to their own specifications.
- 3.73 Wind farm substation buildings are typically of conventional masonry construction, on concrete foundations with a pitched roof constructed of trussed rafters finished in slates or tiles. A security slab of reinforced concrete can be incorporated into the roof construction. In most cases, cable ducts and trenches are formed in the slab of the building. The trenches can be up to 1.5m deep depending on the electrical requirements and the layout of the Site, and also on whether the switchgear in the control building utilises top or bottom entry cables. A typical substation building is illustrated on Figure 3.10.
- 3.74 The substation would house the switchgear and control equipment needed for the grid connection and would also provide some secure storage space that may occasionally be required for the wind farm. A typical substation floor and roof plan is illustrated in Figure 3.10. The building would not be permanently manned as the wind farm would be controlled remotely from a central control facility.

Grid Connection

- 3.75 An off-site grid connection would be required to take the power generated from the wind turbines into the local electricity distribution network. The final details of the grid connection including the precise route and an assessment of any impacts on the environment would be determined by the District Network Operator (DNO) at a later date and may be subject to a separate design and consent process.

Forestry

- 3.76 The proposed development is situated within an active commercial coniferous forestry plantation, dominated by a mixture of sitka spruce and lodgepole pine.
- 3.77 As a result of the proposed development, a total of 258.71 ha would require to be felled to accommodate permanent felling from both the infrastructure footprint, buffer for bats, and management felling. A total of 221.35 ha would be restocked on site.

Habitat Management

- 3.78 Habitat management proposals are required to provide enhancement of the natural environment during operation of the proposed development. These are fully described and explained within Technical Appendix 8.3 within an Outline Habitat Management Plan (OHMP). In outline, the measures include:
- Restoration of degraded peatland across the Site;
 - Creation of woodland habitats;

Commissioning of Mechanical and Electrical Equipment

- 3.79 The turbine supplier normally undertakes the testing and commissioning of a wind farm. It involves a series of tests on the high voltage electrical network, the electrical equipment in the turbines and control building and the SCADA system. No construction activities are required, and it only entails the use of small vehicles.

Pre-Construction Works

- 3.80 A detailed Construction Method Statement (CMS) would be produced by the construction contractors and agreed with THC prior to the commencement of works. The CMS will typically include:
- A description of construction methods;
 - Pollution prevention measures, including dust, emissions, drainage design and materials management;
 - Water quality management and monitoring;
 - Mitigation measures;
 - Management of construction traffic (typically addressed separately in a traffic management plan);
 - Noise and vibration management; and
 - Public liaison.
- 3.81 Prior to commencement of construction, detailed Site surveys would be undertaken to provide data for the final design of the civil and electrical engineering infrastructure for the Proposed Development. These would comprise detailed topographical and geotechnical surveys.
- 3.82 The geotechnical survey would incorporate the excavation and sampling of trial holes at each turbine location and possibly boreholes to obtain information about the underlying strata. This data will determine the need to microsite any infrastructure within the 100m tolerance.
- 3.83 All of the above will take cognisance of best practice guidance and be agreed with THC, the Scottish Environment Protection Agency (SEPA), and other interested parties.

Temporary Highway Works

- 3.84 Prior to construction, some off-site access works would be required including the temporary removal or relocation of street furniture, pruning/removal/replanting of shrubs/trees, and road widening. The detail of these enabling works would be provided in a detailed Traffic Management Plan, likely to be required by a condition to the planning permission.

Construction Works and Construction Programme

- 3.85 Construction works include:
- Temporary highway modifications to enable vehicles to access the Site from the strategic and local highway network, as outlined in Figure 12.4
 - Upgrade of the existing site access junction;
 - Construction of new permanent site tracks and upgrading of existing tracks;
 - Installation of construction compound / storage area for Site office facilities and storage of materials and components;
 - The excavation of borrow pits within identified search areas and extraction of aggregate for new tracks and hardstandings;
 - Installation of hardstandings and outrigger pads for the support of the cranes that would be used for the erection of the turbines;
 - Construction of foundations for the support of the turbine structures;
 - Wind turbine delivery and erection;
 - Installation of transformers in separate housings alongside each wind turbine (if required);
 - Installation of on-site High Voltage (HV) cabling, communication cabling and earthing underground adjacent to access tracks;
 - Installation of Supervisory Control and Data Acquisition (SCADA) system;
 - Construction of substation;
 - Construction of Energy Storage Compound
 - Commissioning of Site mechanical and electrical equipment; and
 - Reinstatement, landscaping, removal of temporary site offices, reseeding verges, borrow pit and areas around turbine bases.
- 3.86 It is estimated that the construction of the Proposed Development would take 18 months and would consist of the operations set out below in Table 3.2 and described later in this chapter.
- 3.87 The programme of construction deliveries shown in Table 3.2 has taken into account all that is currently known about the Site and Proposed Development. The precise duration and timing of each activity may be modified, as necessary, to take into account the findings of the pre-construction works and surveys. The use of construction method statements through a planning condition will provide the detail design and time frames.

Table 3.2: Indicative programme of construction activities (in months)

Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Site Mobilisation																		
Access junction and grading of access slope																		
Construction of main construction compound																		
Excavation of borrow pits																		
Track and turbine compound construction																		
132kV Substation construction																		
Excavating trenches and laying electrical and communication cabling																		
Turbine delivery and installation																		
Energy Storage Compound																		
Turbine fit out, restoration and grid connection																		
Turbine commissioning																		

- 3.88 The works would mainly follow the order detailed above, but many would be carried out concurrently to reduce the overall length of the construction programme. There would be construction phasing, with civil engineering works progressing in some areas whilst turbines are being erected elsewhere. To minimise disruption to land use, site restoration would be undertaken as early as possible in development areas.
- 3.89 Should planning permission be granted then, it is likely that construction hours would be restricted via means of a planning condition imposed by THC as part of the consent.
- 3.90 At this stage it is proposed that construction activities on site shall only take place between the hours of 07:00 to 19:00 on Monday to Friday inclusive and 07:00 to 13:00 hours on Saturday, with no construction works on Sundays or Bank Holidays, unless otherwise agreed with THC.
- 3.91 Outside of these hours, there may be a requirement to take advantage of low wind speeds for the erection of turbines. In addition, turbine erection works cannot suddenly cease; in the event of a delay or complication it may be necessary to continue works beyond normal hours until they can end safely. Other activities that may take place outside these hours are limited to emergency works and dust suppression, unless otherwise agreed in writing by THC.
- 3.92 It is proposed that the delivery of any construction materials or equipment, other than turbine blades, nacelles, and towers, shall be restricted to the above hours, unless otherwise agreed in writing by THC.
- 3.93 Depending on the time of year and the stage of the construction programme, temporary lighting may be required at the temporary compound and substation during working hours. It is not proposed that the lighting will be on outside of working hours unless essential construction work outside normal working hours is required.

Reinstatement and Removal of Temporary Works

- 3.94 On completion of construction, all temporary fencing and the temporary construction compound would be removed from Site and all areas disturbed by the works would be reinstated. Reinstatement works would be subject to a Construction Method Statement to be approved by THC.

Other Construction Considerations

- 3.95 All construction activities will be managed within the requirements of the Construction (Design and Management) Regulations 2015 and will not conflict with the Health and Safety at Work etc. Act 1974. The design of the Development has taken full account of these regulations.
- 3.96 Best practice waste management guidelines and relevant regulations will be complied with as part of the construction programme. A Site Waste Management Plan (SWMP) will be prepared as part of the post-consent CEMP.

Wind Farm Operation

Operational Timescales and Decommissioning

- 3.97 Following construction and commissioning, the Proposed Development would be operational and generating electricity for a period of approximately 35 years, after which it would be decommissioned and removed, or alternatively, a further planning application could be made to extend the period of operation.
- 3.98 If a further application is not submitted, decommissioning would involve the total removal of above-ground infrastructure. This would involve retention of existing access tracks for estate operations. Reinstatement of the Site would be carried out in accordance with an approved method statement. A decommissioning bond would be agreed with THC, and this is expected to be enforced by way of an appropriately worded planning condition.

Maintenance

- 3.99 Wind farm maintenance would be carried out by the turbine supplier and later by suitably qualified contractors to carry out regular inspections and maintenance activities.
- 3.100 Routine maintenance and servicing would necessitate monthly visits to the Site by a maintenance crew (if necessary), typically two persons in a small van or similar sized vehicle. Maintenance staff would be able to park on the crane pad for each turbine and would utilise access tracks for maintenance visits to the substation.
- 3.101 Routine servicing would include the performance of tasks such as maintaining bolts to the required torque, adjustment of blades and inspection of welds in the tower. In addition, oil sampling and testing from the main gearbox would be required and oil and components replaced at regular intervals.
- 3.102 In the event of any unexpected breakdowns on-site, such as the failure of a generator, appropriate maintenance works would be carried out as soon as practicable. The replacement of major components may require a crane and heavy transport vehicles.
- 3.103 On-going track maintenance, if required, would generally be undertaken in the summer months when tracks are dry. Safe access for maintenance purposes would be maintained all year round.

Coille Linne Wind Farm

Environmental Impact Assessment Report Volume 1 Chapter 4: Design Evolution

May 2025

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4 DESIGN EVOLUTION

Introduction

- 4.1 This chapter describes the site selection process used to identify the suitability of the Site. This chapter also provides details on the overarching design strategy employed through the design evolution as well as detailing how, and why the turbine layout and associated infrastructure has been modified during the iterative EIA process, culminating in the proposed development described in EIA Report Volume 1, Chapter 3: Project Description.

Site Selection Methodology and Alternatives

- 4.2 The overall approach to wind farm site selection is to identify areas of land where the siting of a wind farm would result in minimal environmental effects, be free from overriding technical constraints, and be economically viable. This involves:
- A review of the planning context for renewables in Scotland and at the local authority level.
 - A desktop based Geographical Information System (GIS) constraints analysis.
 - Analysis of wind speed data.
 - Consideration of proximity to potential electricity connection points; and
 - A review of suitable site access points and related transportation issues.
- 4.3 In reviewing the option of alternatives, the Proposed Development is the result of GIS 'sieve' mapping, whereby alternate areas for development have been scoped out as less suitable. This chapter describes this initial selection process, as well as the underlying design strategy and iterative design process which demonstrates the alternate plans considered before arriving at the proposed layout illustrated in Figure 3.1.

Review of Planning Context

- 4.4 Information on the planning context for renewables in the local planning authority of The Highland Council (THC) was reviewed as part of the site search exercise, focusing on the relevant Development Plans, national policy, and other relevant material considerations. This exercise also highlighted any pertinent guidance or planning policies pertaining to THC which were applicable to the Proposed Development.

GIS Constraints Mapping

- 4.5 A GIS 'sieve mapping' exercise was carried out in order to further inform the search process. This involved identifying and mapping constraints to wind farm development to identify potential sites. The various constraints considered as part of the site selection exercise for the Proposed Development included but were not limited to:

- Radio and microwave signal – using known constraints to identify areas which could be affected by existing radio and microwave signals;
- Aviation interests – including local licensed aerodromes and visibility to radars, both military and civilian;
- Hydrological, geological and hydrogeological constraints – including effects on groundwater, water resources and local geology;
- Landscape designations – including National Parks, special landscape areas, and local landscape designations;
- Ecological designations – including Ramsar sites, Special Protection Areas, Special Areas of Conservation and Sites of Special Scientific Interest;
- Cultural heritage designations – including Gardens and Designed Landscapes, Registered Battlefields, World Heritage Sites, Listed Buildings, Properties in Care, Conservation Areas and Scheduled Ancient Monuments;
- Potential Grid Connection points - the capacity of the local grid network to accept the likely output from a proposed wind farm is critical to the technical feasibility of a development. The connection voltage and the distance from the wind farm can have a significant effect on the commercial feasibility of a development proposal; and
- The pattern of settlement – with buffers provided around residential properties and settlements.

Wind Speed Data

- 4.6 The predicted wind resource in any given location is an important consideration in identifying potentially suitable wind farm sites. The electricity that can be generated by a wind farm is directly linked to wind speed. Wind speed generally increases with height above ground level and the amount of electricity generated increases disproportionately with increases in wind speed. This in turn affects the carbon emission savings and the commercial viability of a site. Potential wind farm sites are therefore reviewed in relation to a number of publicly available data sources in the first instance, including the NOABL wind speed database¹.

Access Suitability

- 4.7 A desktop exercise was undertaken to ensure that appropriate access was available for the transportation of wind turbine components. Full details are provided in EIA Report Volume 1, Chapter 12: Traffic and Transport.

Selection of the Site

- 4.8 Following a site search based on this methodology and criteria, the Site was selected due to a number of factors, including:

¹ The NOABL wind speed database was created by the Department of Trade and Industry and provides annual mean wind speeds on a kilometre grid square basis.

- Energy capture – software modelling indicates that the Site offers a strong wind resource with few obstacles or areas of pronounced topography close enough to interrupt wind flow;
- Environmental designations – the Flow Country WHS as well as the Strath Duchally SSSI, SAC, SPA and RAMSAR lies partially within the Site Boundary however through careful siting and further site survey, a sufficient distance from this designation has been maintained.
- Landscape – The Assynt-Coigach NSA is located approximately 10km to the west of the proposed development. This was recognised at an early stage of the design process, with efforts being made throughout the design evolution to minimise visual effects of the proposed development from the NSA.
- Residential separation distances – the Site is able to provide separation distances in excess of 2km from the nearest non-involved residential property while having potential for a high installed capacity. Through siting and design, the closest turbines have been situated in excess of 2.8km from inhabited residential properties.
- Transport infrastructure – the Site benefits from suitable access for turbine component delivery; and
- Grid connection – the Applicant has consulted with the Network Operator to accommodate the electricity generated by the Proposed Development.

Design Strategy

- 4.9 The overall design layout principle of the Proposed Development has been to achieve a coherent and compact design, which minimises direct and indirect adverse effects on the local and wider landscape, while balancing commercial considerations and maximising energy production. Figures 3.1 and 4.5 show the final design layout submitted as part of this application.
- 4.10 Key consideration for the Proposed Development focused on the Flow Country WHS designation as well as landscape and visual impacts. The site boundary, whilst larger than turbine envelope, was drawn to allow flexibility in layout, infrastructure and for potential habitat management if required.
- 4.11 The topography varies across the site with Meall Odhar being the highest point within the Site boundary (285m AOD), creates a small glen with the topography increasing to the east of the site boundary. In addition to the specific characteristics of the Site informing the overall strategy, some general design principles were also applied. This included:
- Where possible, the avoidance of overlapping or 'stacked' turbines, through considered placement in order to form a well-spaced group or array when viewed from the receiving landscape including key design viewpoints.
 - The avoidance of outlying turbines which appear separate or stand apart within the landscape in order to reduce the lateral spread of the Proposed Development.
 - The development of a layout which relates well to other existing and proposed wind farms within the local area, as well as being coherent in isolation.

Design Evolution

- 4.12 The design process took place over a number of months and the Proposed Development has been progressively revised and refined during this time to take account of the information arising from pre-application consultation with stakeholders, and the findings of the EIA. As a result, the design and EIA process has been highly iterative and all aspects of the final design, including the location of the wind turbines, crane hardstandings, the site access, layout of the access tracks, the locations of the substation and construction compound have been influenced by various technical, environmental, and planning considerations.
- 4.13 The design of the Proposed Development has been optimised to produce a project which balances the use of land available with the overall impact of the development. This is based on the following technical, economic, and environmental considerations:
- Ground conditions and existing land use: the layout design minimises the impact to areas of peat. Watercourses and critical slope gradients have also been avoided where possible;
 - Residential properties: a residential buffer / stand-off distance of at least 2km from residential properties has been included;
 - Distance between turbines: to minimise the turbulent interaction between turbines they should be spaced in a suitable manner to minimise wind wake effects;
 - Environmental constraints: The assessment chapters (Chapters 6 – 15) of this EIA Report discuss these considerations and issues; and
 - Landscape and visual amenity: Chapter 6 of this EIA Report covers this in depth. The design of the Proposed Development seeks to match the turbines with the scale of the landscape. Due to the location of the site, the landscape and visual aspects of the proposal were key in designing the turbine locations and heights. Computer modelling was used as a tool to aid design and 3D model/ wireframes were generated for views from key locations around the Site.
- 4.14 The positioning of the turbines, through the design, has been continually altered to account for the proximity of constraints as these have been assessed, and as EIA studies have progressed. Stakeholder consultation has been based on both the milestone evolutions detailed below, and a number of other designs between principal evolution stages. These are shown in Figures 4.1, 4.2, 4.3, 4.4 and 4.5.

Layout 1: EIA Scoping

- 4.15 The first design iteration consisted of 22 wind turbines of up to 230m in height to blade tip as illustrated in Figure 4.1. This layout was the basis for the Scoping Report submitted on 25th June 2024 with the resultant Scoping Opinion provided by Scottish Ministers on 20th September 2024. The Scoping layout presented a theoretical maximum number of turbines which could be accommodated on site and took account of the following environmental and technical constraints:
- Application of a 50m buffer on watercourses;
 - Application of a 2km residential buffer;

- Ornithological considerations relating to Greenshank and Golden Plover;
- Avoidance of ecological designations.

- 4.16 At this stage of the project, a key focus of this design was to determine landscape suitability whilst considering the initial buildability of the turbine locations.
- 4.17 This layout was also presented at a public exhibition where feedback from the local community was gathered. Following feedback gathered from the public exhibition, the name of the proposed development was changed from Fiag Wind Farm to Coille Linne Wind Farm.

Layout 2: Post Scoping Layout

- 4.18 Illustrated in Figure 4.2, the post-scoping layout comprised 17 wind turbines of up to 250m to blade tip with a total of five turbines removed from the design following scoping. This reduced the appearance of stacking from viewpoints along the A838 such as Viewpoint (VP)1, VP4 and VP9 as a result of increased spacing around the turbines. The deletion of turbines also resulted in a reduced lateral spread, visible from Viewpoints 5, 6 and 12.
- 4.19 The extent of the Zone of Theoretical Visibility was taken into consideration for this design decision. From analysis, the increase in turbine tip height to 250m translated to a 0.5% increase in visibility across study area and from wireline analysis it was felt that this could be accommodated within the receiving landscape due to the coherent design created through careful turbine placement. This increase in turbine tip height to 250m also resulted in an increase in energy yield for the proposed development.
- 4.20 The layout saw the movement of turbines further away from buffers around watercourses and took account of ecological and ornithological onsite constraints as well as further analysis on wake effect. Following the survey works undertaken within the site boundary, the layout was amended to avoid areas of deep peat where possible.

Layout 3: Revised Layout 1

- 4.21 Following further site design, an additional two turbines were removed from the design. The removal of turbines reduced wake effect across the site due to an increase in turbine spacing for a number of turbines. The design revision also improved the design from viewpoints along the A838, one of the key transport routes in the area, as well as views from Ben Klibreck and Ben More Assynt which are located in the Assynt-Coigach National Scenic Area and Wild Land Area 35, Ben Klibreck-Armie Forest, respectively.
- 4.22 The design principles for the proposed development included the placement of turbines in two loose rows, maximising the full extent of the site and utilising the linear shape of the Site to fit with the existing pattern of development. This can be seen in the design for the cumulative developments in close proximity to the proposed development which includes Shinness Wind Farm (in application) Sallachy Wind Farm (consented) and Creag Riabhach (operational).

Layout 4: Revised Layout 2

- 4.23 The placement of infrastructure prior to Phase 2 peat surveys was carried out in order to progress more detailed site investigations, however an understanding of peat depths across the site was derived from existing Phase 1 peat data and NVC data.
- 4.24 Following the deletion of two turbines from the previous layout, a reconsideration of the proposed development included the significant movement of turbines away from areas of deep peat. When considering turbine movements, Turbine 4 was moved away from the closest watercourses and the deletion of turbines allowed Turbine 1 to be pushed further north and Turbine 2 moved further south.
- 4.25 In order to improve composition from certain viewpoints, a reduction in the spacing around a select number of turbines was carried out. This resulted in a more cohesive and compact layout, reduced the appearance of outliers and limited stacking.
- 4.26 The infrastructure design for this layout was developed at this stage. Access tracks were used to join turbine positions and turbine compounds followed contours and avoided gradients of greater than 12% in line with turbine manufacturer guidance and to minimise incursion into peat wherever practicable. Tracks were also designed for the turning radius of an up to 80m blade. The infrastructure design also sought to reduce the visual impact of onsite tracks, as well as considering other constraints such as watercourses with a 50m watercourse buffer applied except for watercourse crossings.
- 4.27 A key design consideration for infrastructure was to utilise the onsite forestry track as far as possible with spurs used to connect the turbines to the existing spine road and reduce the requirement for new track. The infrastructure design has also included two access options. One option utilises the existing track and branches to connect to T14 with the second options departing from the existing access route and connecting to T15. Whilst two options have been included within the infrastructure design it is likely that only one option will be built out. The lengths of both track options are detailed further in Chapter 3, however both route options have been fully assessed within the EIA Report to ensure alternatives have been considered.
- 4.28 The approach to infrastructure also included placing the substation close to the entrance of the site. This was done to minimise the distance to connect into the existing grid infrastructure and was located on relatively flat land whilst maintaining a topple distance buffer of rotor diameter +10% from the turbines. The main construction compound (and eventual location for battery storage) was placed on similar nearby ground.

Layout 5: Application Layout

- 4.29 Following the completion of Phase 2 peat probing, minor amendments were made to the infrastructure of the site. As shown in Figure 4.5, the changes have included the movement of Turbine 2 and the deletion of a turning head connecting Turbine 2 and 4 to avoid an area of peat which was found to be greater than 1.5m in depth. The movement of this track also led to an overall reduction of track length. In addition to the movement around Turbine 2, the track connecting Turbine 6 and 8 was realigned to

follow the contours in order to reduce the amount of cut and fill which would be required.

- 4.30 The minor movement of turbines still maintained the design principles of Layout 4 which focused on the development of a clear design from key transport routes and hilltop views.
- 4.31 An additional turning head was also added to the road between Turbines 10 and 12 in order to facilitate the delivery of turbines components.

Summary of Design Evolution

- 4.32 The wind farm layout in its proposed form takes account of stakeholder feedback received during pre-application discussions, as well as environmental and technical constraints identified throughout the site selection and iterative design process. In designing a layout which is simple in composition and restrained in size, the final design results in a development which takes into account the constraints associated with the site.
- 4.33 Alternatives were considered during this process and addressed as described above. The proposed development was then frozen and taken forward for Environmental Impact Assessment as is discussed within this Volume.

Coille Linne Wind Farm

Environmental Impact Assessment Report Volume 1 Chapter 5: Renewable Energy and Planning Policy

May 2025

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5 RENEWABLE ENERGY AND PLANNING POLICY

Introduction

- 5.1 This chapter provides an outline of the national and local planning policies, guidance and other material considerations that are considered to be relevant in underpinning the EIA Report for the proposed development.
- 5.2 To maintain the impartiality of the Environmental Impact Assessment Report (EIA Report), this chapter does not assess whether the Proposed Development would comply with the identified policies. A separate Planning Statement which assesses the conformity of the Proposed Development with the Development Plan and other material considerations is also submitted as part of the planning application. The Planning Statement is separate from the EIA Report.
- 5.3 Whilst this EIA Report relates to an application for consent under Section 36 of the Electricity Act 1989 ('the Electricity Act'), deemed planning consent is also sought under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 (as amended) (the TCPA).
- 5.4 While the Development Plan is the starting point for the decision-making process, it must be considered in the context of both the policy hierarchy (governed by Scottish Government policy) which in turn is informed by the wider suite of Scottish, UK and international policy and law relating to renewable energy development and climate change.
- 5.5 This review of the relevant policy and material considerations therefore adopts the following structure:

The Development Plan

- National Planning Framework 4 (NPF4, 2023);
- The Highland-wide Local Development Plan (2012);
- The Caithness and Sutherland Local Development Plan (CaSPlan (2018); and
- Onshore Wind Energy: Supplementary Guidance (2016) with addendum, Dec 2017).

Material Planning Considerations

- Scottish and UK Renewable energy and climate change legislation and policy.

Planning Policy

The Development Plan

National Planning Framework 4

- 5.6 Formally adopted in February 2023, National Planning Framework 4 (NPF4) now forms part of the Development Plan alongside the LDP.
- 5.7 A key provision legislated within section 13 of the Planning (Scotland) Act 2019 is that Section 24 of the Town and Country Planning (Scotland) Act 1997 is now amended to state that in the event of any incompatibility between a provision of NPF4 and the provision of an LDP, then whichever of them is later will prevail.
- 5.8 NPF4 states that the global climate emergency has resulted in the need for reductions in greenhouse gas emissions and changes required to adapt to future impacts of climate change. NPF4 further states that while significant steps have been taken towards the decarbonisation of energy and land use, choices remain on how Scotland can sustainably utilise national assets.
- 5.9 This is reinforced by Scotland's Climate Change Plan, backed by legislation, which has set the approach to achieving net zero emissions by 2045, however significant progress towards this goal must be met by 2030.
- 5.10 NPF4 provides clear policy and legislative support for renewables and specifically onshore wind energy as a principle, in order to reach our Net Zero obligations by 2045 as set out in law.
- 5.11 The Scottish Government is clear and unequivocal about the requirement for new onshore wind generation through legislation and policy.
- 5.12 The inclusion of 'Strategic Renewable Electricity Generation and Transmission Infrastructure' as a 'national development' demonstrates the importance that the Scottish Government places upon the increase in onshore renewable generation. Annex B of NPF4 provides a statement of need. This states that "*a large and rapid increase in electricity generation from renewable sources will be essential for Scotland to meet its Net Zero emissions targets.*"
- 5.13 Wind farms in excess of 50MW generating capacity will comprise national development. The proposed development exceeds this threshold and therefore be classed as a national development. Page 97 of NPF4 sets out that national developments are described as "*significant developments of national importance that will help to deliver the spatial strategy*". It adds that "*their designation means that the principle for development does not need to be agreed in later consenting processes.*"
- 5.14 In conclusion, there is and remains a clear support at a national level for the further development of renewable and low carbon technologies however greater emphasis has been placed on the pace at which these technologies are rolled out. It is then appropriate to examine the contents of particular policies of NPF4.

- 5.15 **Policy 1: Tackling the climate and nature crises** acts as an overarching policy which in turn filters into each individual policy detailed within NPF4, stating that when considering all development proposals, significant weight should be given to the global climate and nature crises, in order to ensure that they are recognised as a priority in all plans and decisions.
- 5.16 The intent behind Policy 1 is to encourage, promote and facilitate development that addresses the global climate emergency and nature crisis. The proposed development inherently seeks to address the climate crisis by providing low carbon energy and reduces greenhouse gas emissions by contributing to a more sustainable energy mix across Scotland.
- 5.17 Therefore, NPF4 introduces a key, prominent policy which states that the global climate emergency is a priority, and significant weight must be attached to this. Onshore wind, as a national development, accords fully with the aspirations of this policy and can draw immediate and full support.
- 5.18 **Policy 2: Climate change and Mitigation** aims to encourage, promote, and facilitate development that minimises emissions and adapts to the current and future impacts of climate change. Policy 2 states:
- a) Development proposals will be sited and designed to minimise lifecycle greenhouse gas emissions as far as possible.*
 - b) Development proposals will be sited and designed to adapt to current and future risks from climate change.*
 - c) Development proposals to retrofit measures to existing developments that reduce emissions or support adaptation to climate change will be supported.*
- 5.19 **Policy 3: Biodiversity** requires that “development proposals contribute to the enhancement of biodiversity, including where relevant restoring degraded habitats and building and strengthening nature networks”, integrating “nature-based solutions where possible”.
- 5.20 **Policy 4: Natural Places** of NPF4 reinforces the need for the protection, restoration and enhancement of natural assets making best use of nature-based solutions. Part a) of this policy states that development proposals which would have an unacceptable impact upon the natural environment by virtue of type, location or scale will not be supported.
- 5.21 Criteria is provided for proposals that impact upon European or national designations, such as SACs, SPAs, National Parks, National Scenic Areas, SSSIs, Ramsar sites. Part d) discusses impacts upon local designations and states where a site is designated as a “local nature conservation site or landscape area in the LDP, it will only be supported where development will not have significant adverse effects on the integrity of the area and qualities for which it has been identified.” Part ii) of d) states the second criteria for support, which is where “*any significant adverse effects on the integrity of the area are clearly outweighed by social, environmental or economic benefits or at least local importance.*”
- 5.22 Part e) states that the precautionary principle is to be applied.

5.23 Part f) states that development proposals that are likely to have an adverse effect upon species protected by legislation will only be supported where it meets the statutory test.

5.24 **Policy 5: Soils** focuses on the protection of carbon-rich soils, the restoration of peatlands and the minimisation of disturbance to soils from development with wording as follows:

Development proposals on peatland, carbon-rich soils and priority peatland habitat will only be supported for:

- i) Essential infrastructure and there are a specific locational need and no other suitable site;*
- ii) The generation of energy from renewable sources that optimises the contribution of the area to greenhouse gas emission reductions targets;*
- iii) Small-scale development directly linked to a rural business, farm, or croft;*
- iv) Supporting a fragile community in a rural or island area; or*
- v) Restoration of peatland habitats.*

5.25 The design of the proposed development has aimed to maximise the most amount of renewable energy with the least amount of infrastructure possible. By applying this principle, the proposed development layout, including turbines and associated infrastructure, has been designed to avoid the areas of deep peat identified, wherever possible, and areas where peat landslide may occur.

5.26 **Policy 6: Forestry, Woodland, and Trees** states under part c) that proposals involving woodland removal will “only be supported where they achieve significant and clearly defined additional public benefits in accordance with relevant Scottish Government policy on woodland removal”.

5.27 **Policy 7: Historic Assets and Places** details under part a) that “development proposals with a potentially significant impact on historic assets or places will be accompanied by an assessment which is based on an understanding of the cultural significance of the historic asset and/or place”. Part h) is also useful and relevant, where it is stated the development proposals affecting scheduled monuments will only be supported “where i) direct impacts on the scheduled monument are avoided, ii) significant adverse effects on the integrity of the setting are avoided or iii) exceptional circumstances have been demonstrated to justify the impact on a scheduled monument and its setting and impacts on the monument or its setting have been minimised”.

5.28 The key policy pertaining to energy is **Policy 11: Energy**, which contains the intent to ‘encourage, promote, and facilitate all forms of renewable energy development onshore and offshore. This includes energy generation, storage, new and replacement transmission and distribution infrastructure and emerging low-carbon and zero emissions technologies including hydrogen and carbon capture utilisation and storage (CCUS).’

5.29 At a local level, the policy also states that Local Development Plans (LDPs) should seek to realise their areas’ full potential for electricity and heat from renewable, low carbon and zero emission sources by identifying a range of opportunities for energy development.

5.30 Policy 11 a) sets out that development proposals for all forms of renewable, low-carbon and zero emissions technologies will be supported, which include:

- i) wind farms including repowering, extending, expanding, and extending the life of existing wind farms;*
- ii) enabling works, such as grid transmission and distribution infrastructure;*
- iii) energy storage, such as battery storage and pumped storage hydro;*
- iv) small scale renewable energy generation technology;*
- v) solar arrays;*
- vi) proposals associated with negative emissions technologies and carbon capture; and*
- vii) proposals including co-location of these technologies.*

5.31 Policy 11 reiterates support for renewable and low carbon technologies, however there is a clear and direct reference to onshore wind farms, recognising this form of energy generation as a key component to achieving the outcomes of Policy 11 as well as wider overarching climate change policy and legislation which aim to expand renewable, low-carbon and zero emissions technologies at a national level.

5.32 While repowering, extensions and expansions are also supported, the creation of new onshore wind development must be supported to ensure there is a continued pipeline of new onshore wind farm schemes, such as the proposed development, which can be revisited for future repowering, extension, and expansion. In addition, the policy also includes support for battery storage which has been included as part of the development with 5MW of storage proposed.

5.33 Policy 11 (e) provides further information on the topics which should be addressed as part of renewable, low-carbon and zero emissions technologies. It states that:

In addition, project design and mitigation will demonstrate how the following impacts are addressed:

- i) impacts on communities and individual dwellings, including, residential amenity, visual impact, noise, and shadow flicker;*
- ii) significant landscape and visual impacts, recognising that such impacts are to be expected for some forms of renewable energy. Where impacts are localised and/ or appropriate design mitigation has been applied, they will generally be considered to be acceptable;*
- iii) public access, including impact on long distance walking and cycling routes and scenic routes;*
- iv) impacts on aviation and defence interests including seismological recording;*
- v) impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised;*
- vi) impacts on road traffic and on adjacent trunk roads, including during construction;*
- vii) impacts on historic environment;*

- viii) *effects on hydrology, the water environment and flood risk;*
- ix) *biodiversity including impacts on birds;*
- x) *impacts on trees, woods, and forests;*
- xi) *proposals for the decommissioning of developments, including ancillary infrastructure, and site restoration;*
- xii) *the quality of site restoration plans including the measures in place to safeguard or guarantee availability of finances to effectively implement those plans; and*
- xiii) *cumulative impacts.*

5.34 Throughout the EIA Report, each topic listed within Policy 11 (e) has been fully assessed.

5.35 Policy 11 states that “in considering these impacts, significant weight will be placed on the contribution of the proposal to renewable energy generation targets and on greenhouse gas emission targets”.

5.36 A key point of policy is that Policy 11e) ii) recognises that where some landscape and visual impacts are to be expected, localised impacts and/ or the application of appropriate design mitigation has been employed, then effects are considered to be acceptable.

Highland-wide Local Development Plan

5.37 The Highland-wide Development Plan (HwLDP) was adopted in 2012 and sets out the general planning policies for the Highland Council area. The HwLDP should be read in conjunction with any Local plans which are still in place. The HwLDP is currently undergoing consultation with an anticipated adoption date of a new HwLDP expected in early 2028. Key consideration is therefore given to the existing plan and at this stage, limited weight can be given to the replacement plan.

5.38 The leading policy of the HwLDP which relates to Renewable Energy Development is **Policy 67: Renewable Energy Development.**

5.39 THC sets out their position in relation to renewable energy developments through this policy and supporting text. THC recognise the benefits associated with renewable energy developments and will seek to enter into agreements with developers on behalf of local communities for environmental and socio-economic purposes. THC acknowledge that socio-economic impacts that are related to the nature and scale of renewable energy development will be a material consideration in the assessment or determination of planning applications.

5.40 Policy 67 states that renewable energy developments should relate well to the source needed for its operation and that THC will consider:

- The contribution of the proposed development towards meeting renewable energy generation targets; and
- Any positive or negative impacts it is likely to have on the local; and national economy.

- 5.41 The policy confirms that proposals will also be assessed against other policies of the Development Plan, the Highland Renewable Energy Strategy and the Onshore Wind Energy Supplementary Guidance and Planning Guidelines and will have regard to other material considerations, including proposals able to demonstrate significant benefits such as by making effective use of existing and proposed infrastructure or facilities. The Highland Council's Supplementary Guidance forms part of the development plan for THC and supplements the key principles of the Development Plan.
- 5.42 THC will support proposals where they are satisfied that they are located, sited, and designed such that they will not be significantly detrimental overall. Either individually or cumulatively with other developments having regard in particular to any of the significant effects on the following:
- Natural, built, and cultural heritage features;
 - Species and habitats;
 - Visual impact and impact on the landscape character of the surrounding area (reflecting the scale and character of the landscape seeking to minimise landscape and visual impact, subject to any other considerations);
 - Amenity at sensitive locations (including residential properties, workplaces, recognised visitor sites);
 - Safety and amenity of (regularly) occupied properties and grounds in relation to noise, ice throw, shadow flicker and shadow throw;
 - Ground and surface water, aquatic ecosystems, and fisheries;
 - Aviation, defence, or emergency service operations, including flight activity, navigation and surveillance systems and associated infrastructure or on aircraft flight paths or MoD low-flying areas;
 - Other communications installations or the quality of radio or TV reception;
 - The amenity of users of any Core Path or other established public access for walking, cycling or horse riding;
 - Tourism and recreation interests; and
 - Land based traffic and transport interests.
- 5.43 Policy 67 includes a requirement that seeks the removal of the development and associated equipment typically restoration of the site.
- 5.44 Proposals for the extension of existing renewable energy facilities will be assessed against the same criteria and material considerations as apply to proposals for new facilities. In all cases, if consent is granted, THC will approve appropriate conditions relating to the removal of the development and associated equipment and to the restoration of the site, whenever the consent expires, other than in circumstances where fresh consent has been secured to extend the life of the project, or the project ceases to operate for a specific period
- 5.45 The Onshore Wind Energy Supplementary Guidance (THC 2016) replaced parts of the Highland Renewable Energy Strategy (THC 2016). It identifies areas to be afforded protection from wind farms; other areas with constraints; and broad areas of search for wind farms (as per the Scottish Planning Policy (2014) document that guided it). It sets out

criteria for the consideration of proposals. It seeks to ensure that developers are aware of the key constraints to such development and encourage them to take those constraints into account at the outset of the preparation of proposals. It seeks to steer proposals, especially those for larger wind farms, away from the most constrained areas and ideally towards the least constrained areas and areas of particular opportunity. It also sets out criteria which will apply to the consideration of proposals irrespective of size and where they are located, enabling proposals to be considered on their merits. It seeks submission as part of the planning application of key information required for the assessment of proposals and provide certainty for all concerned about how THC will consider applications.

- 5.46 Other relevant policies within the HwLDP are detailed below, listed by the general EIA topic applicable.

Landscape and Visual / Design

- 5.47 **HwLDP Policy 28: Sustainable Design** states that *"The Council will support development which promote and enhance the social, economic and environmental wellbeing of the people of Highland"*.
- 5.48 The policy notes that the impact of proposals on individual and community residential amenity will be considered. Reference is also made to sensitive siting considerations as well as the impact on various resources including habitats, Freshwater systems, Species, Landscape, Cultural Heritage, and Scenery.
- 5.49 **HwLDP Policy 29: Design Quality and Place-making** details that *"Applicants should demonstrate sensitivity and respect towards the local distinctiveness of the landscape"*.
- 5.50 **HwLDP Policy 30: Physical Constraints** states that *'Developers must consider whether their proposals would be located within areas of constraints as set out in Physical Constraints: Supplementary Guidance. The main principles of the guidance are:*
- to provide developers with up-to-date information regarding physical constraints to development in Highland; and
 - to ensure proposed developments do not adversely affect human health and safety or pose risk to safeguarded sites.
- 5.51 Where a development is affected by any of the constraints detailed within the guidance, developers must demonstrate compatibility with the constraint or outline appropriate mitigation measures to be provided.'
- 5.52 **HwLDP Policy 36: Development in the Wider Countryside** for the purpose of this policy is defined as 'outwith Settlement Development Areas' and proposals will be assessed for the extent to which they are acceptable in relation to a number of criteria including siting and design, compatibility with landscape character, capacity, and development which would address drainage constraints.

5.53 **HwLDP Policy 61: Landscape** advises that “New developments should be designed to reflect the landscape characteristics and special qualities identified in the Landscape Character Assessment of the area in which they propose”.

5.54 This will include consideration of the appropriate scale, form, pattern, and construction materials, as well as the potential cumulative effect of developments where this may be an issue.’

Ecology and Ornithology

5.55 **Policy 51: Trees and Woodland** states that trees, woodland, and hedges will be protected and where appropriate a woodland management plan will be required to secure management of an existing resource. Where required, additional tree/hedge planting will be requested to compensate removal, as per the requirements of THC's Trees, Woodland, and Development Supplementary Guidance.

5.56 **Policy 58: Protected Species** details that ‘Where there is good reason to believe that a protected species may be present on site or may be affected by a proposed development, we will require a survey to be carried out to establish any such presence and if necessary, a mitigation plan to avoid or minimise any impacts on the species, before determining the application.

5.57 Development that is likely to have an adverse effect, individually and/or cumulatively, on European Protected Species will only be permitted where:

- There is no satisfactory alternative;
- The development is required for preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment; and
- The development will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.
- Development that is likely to have an adverse effect, individually and/or cumulatively, on protected bird species will only be permitted where:
 - There is no other satisfactory solution; and
 - The development is required in the interests of public health or public safety.

5.58 This will include but is not limited to avoiding adverse effects, individually and/or cumulatively, on the populations of the following priority protected bird species:

- Species listed in Annex 1 of the EC Birds Directive;
- Regularly occurring migratory species listed in Annex II of the Birds Directive;
- Species listed in Schedule 1 of the Wildlife and Countryside Act 1981 as amended; and
- Birds of conservation concern.

- 5.59 Development that is likely to have an adverse effect, individually and/or cumulatively on other protected animals and plants will only be permitted where the development is required for preserving public health or public safety.'
- 5.60 **Policy 59: Other Important Species** stipulates that "The Council will have regard to the presence of and any adverse effects of development proposals, either individually and/or cumulatively, on the Other Important Species which are included in the lists below, if these are not already protected by other legislation or by nature conservation site designations:
- *Species listed in Annexes II and V of the EC Habitats Directive;*
 - *Priority species listed in the UK and Local Biodiversity Action Plans;*
 - *Species included on the Scottish Biodiversity List.*
- 5.61 THC will use conditions and agreements to ensure detrimental effect on these species is avoided."
- 5.62 **Policy 60: Other Important Habitats** states that 'The Council will seek to safeguard the integrity of features of the landscape which are of major importance because of their linear and continuous structure or combination as habitat "stepping stones" for the movement of wild fauna and flora (Article 10 Features). The Council will also seek to create new habitats which are supportive of this concept.
- 5.63 The Council will have regard to the value of the following Other Important Habitats, where not protected by nature conservation site designations (such as natural water courses), in the assessment of any development proposals which may affect them either individually and/or cumulatively:
- Habitats listed in Annex I of the EC Habitats Directive;
 - Habitats of priority and protected bird species (see Glossary);
 - Priority habitats listed in the UK and Local Biodiversity Action Plans;
 - Habitats included on the Scottish Biodiversity List.
- 5.64 THC will use conditions and agreements to ensure that significant harm to the ecological function and integrity of Article 10 Features and Other Important Habitats is avoided. Where it is judged that the reasons in favour of a development clearly outweigh the desirability of retaining those important habitats, THC will seek to put in place satisfactory mitigation measures, including where appropriate consideration of compensatory habitat creation.'

Geology, Hydrology and Soils

- 5.65 **Policy 55: Peat and Soils** states that development proposals should demonstrate how they have avoided unnecessary disturbance, degradation or erosion of peat and soils.
- 5.66 **Policy 63: Water Environment** states that 'The council will support proposals that do not compromise the objectives of the Water Framework Directive (2000/60/EC), aimed at the protection and improvement of Scotland's water environment'.

- 5.67 **Policy 64: Flood Risk** requires development proposals within or bordering medium to high-risk flood risk areas will need to demonstrate compliance with Scottish Planning Policy through the submission of suitable information which may take the form of a Flood Risk Assessment.
- 5.68 **Policy 66: Surface Water Drainage** requires that 'All proposed development must be drained by Sustainable Drainage Systems (SuDS) designed in accordance with The SuDS Manual (CIRIA C697) and, where appropriate, the Sewers for Scotland Manual 2nd Edition. Planning applications should be submitted with information in accordance with Planning Advice Note 69: Planning and Building Standards Advice on Flooding paragraphs 23 and 24. Each drainage scheme design must be accompanied by particulars of proposals for ensuring long-term maintenance of the scheme.'
- 5.69 **Policy 72: Pollution** states that 'Proposals should demonstrate the level of impact that they may have on the environment with regard to these types of pollution and if the impact is likely to be significant then how it could be mitigated'.

Cultural Heritage

- 5.70 **Policy 57: Natural, Built and Cultural Heritage** sets out a number of considerations which development proposals will have to take into account in order to ensure the protection heritage features. These features fall into three categories:
1. Local/regional importance: development must not have an unacceptable impact on the natural environment, amenity, and heritage resource;
 2. National importance: any significant adverse effects must be clearly outweighed by social or economic benefits of national importance; and
 3. International importance: Where THC are unable to ascertain that a proposal will not adversely affect the integrity of a site, it will only be allowed if there is no alternative solution and that there are 'imperative' reasons of overriding public interest. The policy states 'Where a priority habitat or species (as defined in Annex 1 of the Habitats Directive) would be affected, development in such circumstances will only be allowed if the reasons for overriding public interest relate to human health, public safety, beneficial consequences of primary importance for the environment, or other reasons subject to the opinion of the European Commission (via Scottish Ministers). Where we are unable to ascertain that a proposal will not adversely affect the integrity of a site, the proposal will not be in accordance with the development plan within the meaning of Section 25(1) of the Town and Country Planning (Scotland) Act 1997'.

Other Issues

- 5.71 **Policy 77 Public Access** states that 'Where a proposal affects a route included in a Core Paths Plan or an access point to water, or significantly affects wider access rights, then The Council will require it to either:
- retain the existing path or water access point while maintaining or enhancing its amenity value; or

- ensure alternative access provision that is no less attractive, is safe and convenient for public use, and does not damage or disturb species or habitats.

5.72 For a proposal classified as a Major Development, the Council will require the developer to submit an Access Plan. This should show the existing public, non-motorised public access footpaths, bridleways, and cycleways on the site, together with proposed public access provision, both during construction and after completion of the development (including links to existing path networks and to the surrounding area, and access point to water).'

The Caithness and Sutherland Local Development Plan

- 5.73 The CaSPlan was adopted by THC in August 2018 and sets out the policies and land allocations to guide development in the area over a 20-year period.
- 5.74 The CaSPlan sets out a strategic vision for the area and includes a number of development allocations. The CaSPlan does not include any specific designations or planning policies relating to onshore wind energy developments or the Site.
- 5.75 The CaSPlan is not accompanied by any relevant appropriate supplementary guidance.

Onshore Wind Energy: Supplementary Guidance (2016)

5.76 In addition to the local development plans, The Highland Council have issued the "Onshore Wind Energy: Supplementary Guidance, November 2016" and "Addendum Supplementary Guidance: Part 2b Highland Strategic Capacity December 2017", hereafter referred to as the "Supplementary Guidance", which set out how Highland Council will manage onshore wind energy development proposals in line with Section 22 of the Town and Country Planning (Scotland) Act 1997 as amended by the Planning etc. (Scotland) Act 2006.

Landscape and Visual

- 5.77 The EIA Report should illustrate the design process undertaken to avoid and mitigate any significant adverse landscape and visual effects. The following key aspects (as listed in paragraph 4.11 of the SG) may be relevant in the assessment of a proposal and should be considered when preparing an application:
- The capacity of the local landscape character (as defined within a Landscape Character Assessment) to accommodate the proposal;
 - Special Landscape Areas;
 - National Parks or National Scenic Areas and mapped wild land areas;
 - Settlement and residential buildings – developments should not be 2 km from either, unless proper consideration for any adverse effects can demonstrated, and those effects minimised or mitigated; and
 - Impact to important public views – e.g. popular viewpoints, road network, tourist routes, public footpaths, core paths and other recognised visitor locations.

5.78 As stated in Paragraph 4.14 of the SG, “where effects are unavoidable, appropriate mitigation will be required to overcome or otherwise minimise impacts. For example, this may include:

- Careful siting of turbines to seek to reduce overall impact of the scheme;
- Amending turbine configurations, including hub height, rotor diameter, and blade rotation speed;
- Adjusting the number of turbines;
- Considering turbine colour, including any variation from the typical off-white/ pale grey colours;
- Design and arrangement of any lighting required to minimise its impact;
- Undergrounding of any power lines connecting individual turbines to any on-site sub-station;
- Undergrounding or sensitive treatment of those power lines connecting any wind farm sub- station to the electricity distribution system;
- Arrangements for any transformers for individual turbines (the Council expects these to be accommodated and enclosed within the turbine mast in order to reduce the landscape and visual impact of the development);
- Length, route, visibility, methods, and materials used in the construction of access tracks.”

5.79 The Supplementary Guidance also states that the following criteria detailed in Table 5.1 “do not set absolute requirements, but rather seek to ensure developers are aware of key potential constraints to development.”

Table 5.1: Landscape & Visual Criteria in Section 4 of the Supplementary Guidance.

Criteria	Measure	Development Threshold
Criterion 1: Relationship between Settlements/Key locations and wider landscape respected.	The extent to which the proposal contributes to perception of settlements or key locations being encircled by wind energy development	Turbines are not visually prominent in the majority of views within or from settlements/Key Locations or from the majority of its access routes.
Criterion 2: Key Gateway locations and routes are respected.	The extent to which the proposal reduces or detracts from the transitional experience of key Gateway Locations and routes.	Wind Turbines or other infrastructure do not overwhelm or otherwise detract from landscape characteristics which contribute the distinctive transitional experience found at key gateway locations and routes
Criterion 3: Valued natural and cultural landmarks are respected	The extent to which the proposal affects the fabric and setting of valued natural and cultural landmarks	The development does not by its presence, diminish the prominence of the landmark or diminish its relationship to its setting.
Criterion 4: The amenity of key recreational routes and	The extent to which the proposal affects the amenity of	Wind Turbines or other infrastructure do not

Criteria	Measure	Development Threshold
ways is respected.	key recreational routes and ways (e.g. Core Paths, Munros and Corbetts, Long Distance Routes etc.)	overwhelm or otherwise significantly detract from the visual appeal of key routes and ways
Criterion 5: The amenity of transport routes is respected	The extent to which the proposal affects the amenity of transport routes (tourist routes as well as rail, ferry routes and local road access)	Wind Turbines or other infrastructure do not overwhelm or otherwise significantly detract from the visual appeal of transport routes
Criterion 6: The existing pattern of Wind Energy Development is respected	The degree to which the proposal fits with the existing pattern of nearby wind energy development, considerations include: ▪ Turbine height and proportions, ▪ density and spacing of turbines within developments, ▪ density and spacing of developments, ▪ typical relationship of development to the landscape. ▪ previously instituted mitigation measures ▪ Planning Authority stated aims for development of area	The proposal contributes positively to existing pattern or objectives for development in the area.
Criterion 7: The need for separation between developments and/ or clusters is respected	The extent to which the proposal maintains or affects the spaces between existing developments and/ or clusters	The proposal maintains appropriate and effective separation between developments and/ or clusters
Criterion 8: The perception of landscape scale and distance is respected	The extent to which the proposal maintains or affects receptors' existing perception of landscape scale and distance.	The proposal maintains the apparent landscape scale and/or distance in the receptors' perception.
Criterion 9: Landscape setting of nearby wind energy developments is respected	The extent to which the landscape setting of nearby wind energy developments is affected by the proposal.	Proposal relates well to the existing landscape setting and does not increase the perceived visual prominence of surrounding wind turbines.
Criterion 10: Distinctiveness of Landscape character is respected	The extent to which a proposal affects the distinction between neighbouring landscape character types, in areas where the variety of character is important to the appreciation of the landscape.	Integrity and variety of Landscape Character Areas are maintained.

Public Access

- 5.80 The Supplementary Guidance (THC, 2016) states that all proposals should seek to avoid significant adverse impacts on the quality and quantity of public access including any impact on a route included in a Core Paths Plan, an access point to water, wider access rights or Rights of Way as provided by the Scottish Rights of Way Society (refer to Chapter 13 of this EIAR, Socio Economic & Tourism Assessment).
- 5.81 THC encourage the improvement of path networks and creation of new access opportunities. THC also encourage the erection of information boards at entrances to sites to make members of the public aware of relevant information and any potential risks.
- 5.82 Should any negative impacts upon public access be identified through the EIA process then appropriate mitigation should be undertaken, including the following:
- “Retention of any existing path or water access point while maintaining or enhancing its amenity value; or
 - Alternative access provision maintaining the same level of amenity, safety, and convenience for public use.”
- 5.83 An Access Plan illustrating the existing public, non-motorised public access footpaths, bridleways and cycleways on the site, together with proposed public access provision, both during construction and after completion of the development (including links to existing path networks and to the surrounding area, and access points to water) should be provided for any Major Development.
- 5.84 The right of responsible access must be maintained during construction. Reference should be made to the SNH’s Guidance for the Preparation of an Outdoor Access Plan (SNH, 2010) and The Land Reform (Scotland) Act 2003.

Noise Assessment

- 5.85 Noise assessments submitted in support of applications for large wind turbines (rotor diameter >16m) should be undertaken in accordance with ETSU-R-97 and the Institute of Acoustics “Good Practice Guide”. The Noise Assessment for the proposed development can be found in Chapter 11.
- 5.86 Assessment of proposals by THC will focus on the following key principles:
- a) “Highland Council's expectation is that all proposals will seek to achieve noise limits at sensitive locations that are at the lower end of the range indicated in national guidance, and we may seek limits lower than that in certain circumstances. This is because, in effect, national guidance addresses an average and therefore does not account for Highland's generally lower level of background noise. For example, Highland has a generally low density of development and less noise-generating industry and transport infrastructure, with certain features like motorways not present. The specific limit will depend on area specific factors and applicants are strongly encouraged to engage with the Council at the earliest opportunity to discuss noise limits of their proposal.

- b) Further to the above, the selection of proxy background monitoring locations should also reflect this approach. Monitoring locations should be chosen which have very similar characteristics to the properties they will represent. Where such locations do not exist or cannot be used, the expectation is that monitoring locations with the lowest background levels will be chosen to represent other properties. Applicants are advised to liaise with the Council to discuss monitoring locations prior to installation of equipment.
- c) 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.
- d) Research into amplitude modulation is ongoing and currently there is no accepted best practice for measuring, monitoring, or setting limits. Should any such guidance become available, Highland Council will expect developers to follow its recommendations."

Natural and Historic Environment

5.87 To comply with the supplementary guidance, developments should:

- Provide sufficient information to enable the Council to carry out an appropriate assessment to determine whether significant effects are likely;
- Consider Special Landscape Areas within the Highlands where relevant;
- Demonstrate there will be no impact to the natural environment resources of Highland;
- Avoid significant adverse effects on the siting, context or setting of historic environment assets;
- Seek to avoid any adverse impacts on species protected within the HwLDP. This includes those in Schedule 2 and 4 of the Conservation (Natural Habitats. &c.) Regulations 1994 as amended (European Protect Species); and
- Consider impacts to the wider natural heritage beyond designated areas, including.

Operational Efficiency of Other Communications

5.88 The siting of wind turbines must have regard to radio, TV, telecoms, and other communication systems.

5.89 Developments shall be assessed by consultation with relevant operators.

5.90 Planning conditions or legal agreements may require developers to correct any electromagnetic interference at their own expense. The Joint Radio Company should be contacted for joint screening for telemetry or microwave links in use by either electricity or gas utilities.

Operational Efficiency of Wind Energy Developments

5.91 Existing and consented wind farms' operational efficiency should not be compromised by adjacent development proposals. For example:

- where a new adjacent wind farm proposal could reduce the wind resource of the existing or consented scheme;
- where a new adjacent proposal for another type of use, for example a large industrial building, could reduce the wind resource of the existing or consented scheme; or
- where there is an allocated development site for another type of use (e.g. an allocated housing site in an adopted Local Development Plan) that may have the potential to limit the efficiency of the proposal (e.g. by requiring mitigation).

- 5.92 Mitigation measures should be proposed only as a last resort as this has potential to adversely impact on the efficiency of the scheme.
- 5.93 To find out more about the location of windfarm developments and proposals, applicants should refer to the Highland Windmap and the Council's ePlanning webpages.

Water Environment

- 5.94 The Proposed Development should consider the requirements of the Water Framework Directive and show how no significant adverse effects will occur individually or cumulatively on the water environment.
- 5.95 There should remain a minimum buffer of 50m between any works and the water environment.
- 5.96 Where impacts on the water environment cannot be avoided, developers will be expected to demonstrate how these impacts will be mitigated. The water environment includes ground water, surface water (including water supplies), and groundwater dependent terrestrial ecosystems. The measures proposed to protect the environment during construction should be included in a Construction Environmental Management Plan and a detailed Schedule of Mitigation (SoM). SEPA's Planning Guidance on Windfarm Developments (39) provides detailed advice.
- 5.97 SEPA, Scottish Water and other relevant should be consulted prior to submission of the planning application to discuss their proposals and to ensure they meet necessary requirements. This opportunity may be available through the 'Pre-application Advice' service The Highland Council provides.

Peat

- 5.98 Geotechnical and hydrological information regarding peat should be provided. Including the risk of landscape and identify the presence of peat on site.
- 5.99 The following key factors will be taken into account by THC where a proposed development has potential to affect peat and should be included within the Peat Management Plan (PMP) and CEMP Plans:
- Site investigation should begin early in the EIA design process. Where peat is found to be present on site, geotechnical and hydrological information, including information

on the risk of landslide and peat slide related to the development should be provided.

- Peat survey and site assessment should inform the siting and design of wind turbines and all associated infrastructure. Through this assessment, impacts on peat should be avoided, for example, by careful siting of the windfarm components to avoid deep peat, and avoid altering hydrological regimes. The information gathered for such site options should be clear, concise and shows detailed mapping of peat depth and all proposed development activities together (e.g. Turbines, access tracks and proposed borrow pits), as well as details of the basic peatland characteristics.
- The 'carbon rich soils, deep peat and priority peatland habitat (CPP)' map produced by SNH should be taken into consideration. Classes 1 & 2 on that map are a Group 2 constraint in the Spatial Framework, a nationally important mapped environmental asset. The map indicates where the resource is likely to be found and should be used to guide development away from the most sensitive resources. Therefore, if a proposal is brought forward in an area identified as CPP, and it is found that the development will be located on carbon rich soils, deep peat or priority peatland habitat, it is unlikely to be supported unless it can be demonstrated through the Environmental Impact Assessment process that any significant effects on the qualities of the area(s) can be substantially overcome through siting and design or by suitable mitigation. Impacts must consider all stages from project inception to wind farm operation and decommissioning.
- Mitigation of effects on peat and mapped CPP may include construction methods such as the use of floating tracks or piling for turbine foundations. It may also take the form of habitat restoration or habitat improvements, which may be achieved in areas of the site not being developed, and possibly on other peatland sites. Proposed restoration and improvements should be presented in a draft Habitat Management Plan that provides sufficient information to demonstrate how proposals will be implemented and managed.
- When considering applications, The Highland Council will expect to receive clear information about the whole life carbon balance of the proposal. This can be undertaken, for example, by using a 'Carbon Calculator.' Schemes applying under Section 36 of the Electricity Act (1989) are required to use the carbon calculator."

Safety and Amenity at Sensitive Locations

5.100 Highland Council 'consider all residential buildings to be particularly sensitive to wind energy development' and so developers are expected to 'clearly demonstrate how potential impacts on amenity have been avoided or mitigated against' if the development is within 2km of residential buildings and settlements. Developments should also consider:

- Landscape and Visual Impacts-All proposals should seek to avoid or mitigate impacts on landscape and visual amenity. The principles guide assessment of these issues is set out in the 'Landscape and Visual Effects' section of the Supplementary Guidance;
- Noise – a full assessment should be completed using the recommended methodology;

- Shadow Flicker – THC recommend that developments are located at least 11 rotor diameters from nearby residential properties;
- Safety – Turbines should be located at least a distance equal to twice the height of the turbine to blade tip from public roads and railways; and
- Mitigation by conditions- THC may impose planning conditions to ensure adequate mitigation of impacts on amenity at sensitive locations. Scottish Government's planning advice discusses these matters further and provides further guidance and assessment methods.

Tourism and Recreation

5.101 Consideration must be given to how a development will influence tourism and recreation within the local area (and this is covered in Chapter 13 of this EIA). As a result, the following factors will be taken into consideration by THC when assessing the proposed development:

- a) Relevant research into the potential effects of wind farms on tourism and recreation (for example, Scottish Government's commissioned report into the economic impacts of wind farms on Scottish tourism and Visit Scotland's Wind Farm Consumer Research (2011));
- b) The potential for socio-economic benefits to be derived from development proposals, for example, evidence of community benefit discussions. Further information can be found in the section on 'Socio-economic benefits of onshore wind development';
- c) The potential for effects on industries for which Highland's landscape is important - for example tourism and recreation; and
- d) The potential for secondary effects for tourism and recreation, such as a change in land use that causes adverse effects, for example, a change from forestry to a wind farm, or where there are potential benefits like improved public access in the area.

Airport, Defence and Emergency Service Operations

5.102 All proposals should seek to avoid significant adverse effects, individually and cumulatively, on airport, defence, or emergency service operations. This includes flight activity; navigation and surveillance systems; and associated infrastructure. This is covered in Chapter 13 of this EIA.

5.103 The following factors should be taken into consideration by developers when designing and siting the proposed development:

- MOD Safeguarding Extents;
- Health and Safety Executive Safeguarding Zones;
- NATS En Route Plc Safeguarding Maps;
- Department of Trade and Industry 'Wind Energy and Aviation Interest – Interim Guidance';
- Airport Safeguarding Surfaces; and
- Private Airfields.

Traffic and Transport

- 5.104 The Supplementary Guidance suggests that development sites should be ideally 'chosen where the road network has suitable alignment, width and strength to carry abnormal loads, and the construction traffic associated with the scale of the development proposed.'
- 5.105 Proposals for the use of the public roads and mitigation works will require the approval of the Roads Authority. Developers will be required to enter into a Section 96 (Roads Scotland Act) agreement with the Council to cover damage to the public roads by construction traffic and may be required to provide a bond as surety. Developers should consider measures to reduce the impact of construction traffic on the road network.
- 5.106 The passage of abnormal loads required for the transport of turbine components can be problematic and should be given very early consideration in the planning of projects.
- 5.107 A Transport Assessment was carried out to establish the transport impacts of the construction traffic associated with the development, the suitability of the existing road network, the impact on existing road users and adjacent communities, and the requirement for any mitigation works. Where trunk roads are to be used for transporting abnormal loads, a trunk roads assessment should be undertaken in consultation with Transport Scotland, further guidance is available from the Transport Scotland website. Equally, where temporary or permanent mitigation is proposed to the trunk road network will require to be discussed and agreed with Transport Scotland.

Electricity and Gas Infrastructure

- 5.108 An appropriate separation distance should be maintained between the proposed development and electricity transmission underground cables, overhead lines, and underground gas transmission pipelines. Developers are advised to consult the relevant grid company for further advice on whether the work they are intending to undertake has the potential to affect their infrastructure. Developers are also strongly advised that they should obtain their written consent prior to submission of the planning application, this will help to provide a fuller understanding of the constraints present and how the development will overcome them.

Borrow Pits

- 5.109 Aggregate and other mineral resources required for a proposal should be sourced from local quarries, rather than creating borrow pits on-site.
- 5.110 On-site borrow pits may be used where it can be clearly demonstrated that there are significant environmental or economic benefits compared to obtaining material from local quarries. Where on-site borrow pits are proposed, information should be provided about what potential environmental impacts may arise if material sourced from borrow pits is found not to be suitable for all required construction activities.

Construction Environmental Management Plans

- 5.111 Major developments and developments subject to Environmental Impact Assessment should follow a robust project environmental management process, following the approach set out in the Council's Guidance Note for construction environmental management plans.
- 5.112 The Highland Council encourage early consultation regarding construction plans.

Restoration Bonds

- 5.113 Robust financial guarantees secured either by bond of caution (Bond) or by irrevocable letter of credit (LoC) from an appropriate bank should in place over the lifespan of the proposed project. Parent Company Guarantees will not be accepted. THC will review these to ensure that the value of bond is sufficient to restore the site at the end of the permission.
- 5.114 Applicants should be clear from the outset about any elements of their proposed scheme that they intend to retain once the site is restored so that these can be factored into any assessments.
- 5.115 Further information about restoration and decommissioning are included in the following guidance:
- Heads of Planning Scotland Position Statement on the Operation of Financial Mechanisms to Secure;
 - Decommissioning, Restoration and Aftercare of Development Sites;
 - Siting and Designing Wind Farms in the Landscape (66) Decommissioning and Restoration Plans for onshore wind farms; and Planning for development: What to consider and include in Habitat Management Plans (68) SNH Commissioned Report 591: Research and guidance on restoration and decommissioning of onshore wind farms.

Other Material Considerations

- 5.116 This section sets out the most relevant material policy considerations at the time of writing and includes national planning policy in Scotland, the latest developments in Scottish and UK Government policy.

UK Renewable Energy Policy and Legislation

- 5.117 The UK Government is legally committed to the delivery of a reduction in emissions to 'net zero' by 2050 (with the Scottish Government committing to 2045).
- 5.118 This section identifies recent shifts in UK-wide Renewable Energy Policy to accommodate this and summarises some key documents including:
- The Clean Power 2030 Action Plan (December 2024)
 - The CCC Annual Report to UK Parliament (July 2024);

- National Audit Office report 'Achieving Net Zero' (December 2020);
- The UK's Sixth Carbon Budget (December 2020);
- The UK Energy White Paper (December 2020); and
- The UK Net Zero Strategy (October 2021).

The Clean Power 2030 Action Plan

- 5.119 The Clean Power 2030 Action Plan, published in December 2024 by the UK Government, clearly highlights the requirement for rapid deployment of new clean energy capacity across the whole of the UK. The document reflects the shared renewable ambitions of the UK, Scottish and Welsh Governments and in accepting the government's central role in steering the creation of this new energy system, the document sets out the expectations for the 2030 capacities of key technologies at national and regional level.
- 5.120 Focusing on onshore wind specifically, the target set out within the document aims for 27-29 GW of capacity. Combined with large targets for other technologies such as solar and offshore wind, the key aim is to significantly reduce dependence on fossil-fuels – particularly gas.
- 5.121 In order to deliver the capacity, there is a requirement to deploy these technologies at a very significant scale and pace, which can only be delivered by taking rapid action to unblock delivery challenges. The ability to maximise the efficiency of the electricity system today and in future, is critical to delivering decarbonisation and a key step to achieve net zero by 2050.
- 5.122 Whilst the proposed development is unlikely to meet the 2030 target date for generation of clean power, it is clear that onshore wind forms a key part of the clean power mix for 2030 and beyond to 2035.

The CCC Annual Report to UK Parliament (July 2024)

- 5.123 The CCC published a landmark report entitled 'Net Zero – UK's Contribution to Stopping Global Warming' in May 2019. The foreword sets out that "the CCC has reviewed the latest scientific evidence on climate change, including last year's IPCC special report on global warming of 1.50C and considered the appropriate role of the UK in the global challenge to limit future temperature increases." It adds, "Net Zero is a more fundamental aim than previous targets. By reducing emissions produced in the UK to zero, we also end our contribution to rising global temperatures."
- 5.124 The report makes recommendations for the UK economy including a new tougher emissions target of net zero green gases by 2050, therefore ending the UK's contribution to global warming within 30 years. This replaces the previous target of an 80% reduction by 2050 from a 1990 baseline and accords with the obligations under the Paris Agreement.
- 5.125 The report makes clear that at a UK level "current policy is insufficient for even the existing targets."

- 5.126 In June 2019, the Prime Minister Theresa May brought forward legislation to turn Net Zero into law, and the UK became the first major economy in the world to pass legislation to end its global warming contribution by 2050. The target is now legally binding via the provisions of the Climate Change Act 2008 (2050 Target Amendment) Order 2019.
- 5.127 The CCC Annual Report to Parliament (2020) offered an update on the progress towards Net Zero following adoption of the Net Zero Target.
- 5.128 The report states that in terms of building a resilient post-Covid economy, *“success requires that net zero emissions and improved climate resilience are integral,”* whilst investments towards achieving net zero will *“help create jobs and stimulate economic recovery, whilst changing the course of UK emissions and improving our resilience to climate change.”*
- 5.129 The National Audit Office offered an update report ‘Achieving Net Zero’ in December 2020 regarding progress on achieving Net Zero following the change to legislation in June 2019.
- 5.130 Key points from the report include that reducing emissions to achieve net zero will require wide ranging changes to the UK economy including further investment in renewable energy, changes *“unprecedented in their overall scale.”*
- 5.131 Page 22 of the report sets out that a national fourfold increase in renewable energy capacity is needed.
- 5.132 The CCC set out the Sixth UK-wide carbon budget in December 2020 with recommendations from 2033 to 2037. This sets out the path the UK must follow to achieve Net Zero by 2050.
- 5.133 A key point includes the CCC's clear statement that new demand for electricity will mean that demand will rise 50% by 2035 and perhaps doubling or trebling by 2050.
- 5.134 The UK Energy White Paper in December 2020 set out a major shift in UK policy and highlights the importance of renewable forms of electricity. Page 38 states that a key objective is to *“accelerate the deployment of clean electricity generation through the 2020s”*.
- 5.135 The UK Government then published the UK Net Zero Strategy in October 2021 which sets out the long-term pathway to net zero by 2050, setting out the UK Government's plans to reduce emissions from each sector of the economy. It sets out within page 103 that the Government will support sustained deployment of low carbon generation and that there is a need to continue to drive rapid deployment of renewables.

Scottish Renewable Energy Policy

- 5.136 A climate emergency was declared in Scotland in 2019 by both the Scottish Government and the Highland Council.
- 5.137 When it was enacted, the Climate Change (Scotland) Act 2009 set world leading greenhouse gas emissions reduction targets, including a target to reduce emissions by

80% by 2050. However, the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 amends the 2009 Act and sets even more ambitious targets – which reflect the recommendations of the Committee on Climate Change (CCC) for a net zero greenhouse gas (GHG) emissions target by 2045 at the latest, with challenging interim stages – a 75% reduction target by 2030 and 90% by 2040.

5.138 This section identifies recent shifts in Scottish Renewable Energy Policy and summarises some key documents including:

- The Scottish Energy Strategy (2017)
- Draft Energy Strategy and Just Transition Plan (2023)
- Climate Change (Emissions Reduction Targets) (Scotland) Act (2019)
- Climate Change Committee (CCC) Report to Scottish Parliament – Progress in reducing emissions in Scotland (March 2024)
- The Update to the Climate Change Plan (December 2020);
- The Green Industrial Strategy (September 2024)
- The Onshore Wind Policy Statement (2022); and
- Onshore Wind Sector Deal (2023)
- Climate Change Committee Scotland's Carbon Budget (2025).

Scottish Energy Strategy (2017)

5.139 The Scottish Energy Strategy 2017 sets out the Scottish Government's overarching position on many forms of energy, including onshore wind. Specifically, it states that "*onshore wind must continue to play a vital role in Scotland's future" ... "which can be done in a way which is compatible with Scotland's magnificent landscapes..."* These reiterate the findings of the Onshore Wind Policy Statement and aim to drive Scotland towards Net Zero by 2045, with a clear focus on the delivery of 12GW of new installed capacity by 2030.

Draft Energy Strategy and Just Transition Plan (2023)

5.140 The Draft Energy Strategy and Just Transition Plan (2023) states that we need to transform the way Scotland generates, transports, and uses energy, in order to realise climate change ambitions. The requirement for an additional 12GW of onshore wind is a key policy facet of this document.

Climate Change (Emissions Reduction Targets) (Scotland) Act 2019

5.141 The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 bill, introduced to Parliament on 23rd May 2018, was subsequently passed in September 2019.

5.142 The Bill raises the ambition of further reducing greenhouse gas emissions by amending the targets set out within the Climate Change (Scotland) Act 2009, hence superseding them and sets a legally binding net zero target for all greenhouse gases by 2045. This target date is five years ahead of the current date set for the rest of the UK and aims to ensure Scotland contributes to the worldwide efforts to deliver on the Paris Agreement. It requires net zero by 2045 at the latest.

- 5.143 Whilst the target of net zero for 2045 remains, a statement made by the Climate Change Committee explained that the delay of the governments Climate Change Plan has meant that the goal of achieving a 75% reduction target by 2030 is fundamentally unachievable. As such, on the 18th of April 2024, the Scottish Government stated that:

'In light of the UK-wide Climate Change Committee's (CCC) recent rearticulation that the 2030 target for emissions reduction is not achievable, this will no longer be a statutory target.'

- 5.144 Despite the removal of the 75% emission reduction target, setting a net-zero target by 2045 is an ambitious target and places Scotland at the forefront of efforts to combat climate change.

Climate Change Committee (CCC) Report to Scottish Parliament – Progress in reducing emissions in Scotland (March 2024)

- 5.145 As set out above, the CCC Report presented to the Scottish Parliament entitled 'Progress in reducing emissions in Scotland' in March 2024. The related press release states that Scotland's 2030 climate goals are no longer credible due to continued delays to the updated Climate Change Plan and other related climate policies.

- 5.146 The press release states that a path to Scotland's post-2030 targets remain however stronger action is needed to reduce emissions across the economy. It states that there has been some progress in delivering renewable electricity generation in Scotland with the aim to develop 8-11 GW of offshore wind and 20 GW on onshore wind capacity, both by 2030. However, the report notes that "The growth in onshore wind capacity has slowed, however, and is slightly off track to deliver its 2030 target, which will require operational capacity to more than double." Page 40 states that in terms of onshore wind, Scotland must increase the deployment rate by more than a factor of 4 to an average annual rate of 1.4 GW.

The Update to the Climate Change Plan (December 2020);

- 5.147 In December 2020, the Scottish Government published an update to the Climate Change Plan, covering the period 2018 to 2032, and responding to the new requirement in Scotland to meet net zero by 2045. This is a key strategic document on our green recovery following on from COVID-19. Page 9 in particular sets out the strategic goal of achieving "decarbonisation across the whole energy system, including electricity, transport, industry and buildings" and "integrating climate change action into all of the decisions we make across Government".

- 5.148 The Update sets out the intention to prepare an Energy Strategy in 2021 and an updated Electricity Generation Policy Statement by 2022. Page 19 refers to a 2032 'pathway' whereby decisions take account of benefits across all energy sectors as well as economic and social benefits they create across Scotland. By 2032 it is intended that we will generate at least the equivalent of 50% of our energy from renewable sources. It is stated on page 18, importantly, that "there will be a substantial increase in renewable generation, particularly through new offshore and onshore wind capacity".

- 5.149 The planning and consenting systems are recognised (p78) as remaining a “critical enabler of rapid renewables deployment in Scotland”. The Climate Change Plan Update expects that renewable energy generation is expected to increase substantially between now and 2032 with an expectation of the development of between 11 and 16GW of new capacity to meet a rapidly increasing electricity demand.

The Green Industrial Strategy (September 2024)

- 5.150 In September 2024, the Scottish Government published a Green Industrial Strategy (GIS). The Executive Summary sets out the mission of the GIS, which states:

"This Green Industrial Strategy's mission is to ensure that Scotland realises the maximum possible economic benefit from the opportunities created by the global transition to net zero".

- 5.151 The strategy sets out five opportunity areas for Scotland where identified strengths are most likely to lead to growth and the potential to develop internationally competitive economic clusters. The points focus on maximising Scotland's wind economy, developing carbon capture, utilisation, and storage, supporting the green economy by way of professional and financial services, expanding upon the hydrogen sector and establishing Scotland as a competitive centre for clean energy intensive industries of the future.

- 5.152 When focusing on onshore wind specifically, it is referred to detail at page 21 where the strategy states:

"Onshore wind is the biggest single technology in Scotland's current mix of renewable electricity generation, comprising 62% of installed capacity.

A thriving onshore wind sector is therefore critical to the decarbonisation in Scotland and the UK. As set out in our 2022 Onshore Wind Policy Statement, Government and industry are focused on delivering at least 20 GW of onshore wind by 2030 (doubling current capacity) and recent pipeline analysis shows that we should be on track to deliver this.

This trajectory is underpinned by the Onshore Wind Sector Deal which sets out a set of specific collaborative actions which include commitments by both the Scottish Government and the onshore wind industry to help deliver the 20 GW ambition.

A supportive policy environment and successful industry collaboration via the Onshore Wind Strategic Leadership Group confirms the shared commitment of Government and industry to achieve this successful and responsible growth.

The onshore wind workforce is highly skilled and opportunities in installation, consulting, operations, and maintenance are anticipated to rise in response to growth ambitions. Specialised engineering consultancy services such as wind farm design and financial due diligence related to onshore developments are expected to grow and offer additional export potential. There is commercial opportunity in circular supply chains related to the UK wind industry. Scotland's established, and now ageing onshore wind assets may also offer opportunities for innovative solutions in remanufacturing, recycling, and decommissioning end of life assets."

- 5.153 It is evident that in order to progress the Government's objectives with regard to wind energy, clear support for new investment and growth in onshore wind development is needed. Realisation of the economic and social opportunities can only be achieved through the development and consenting of additional wind energy developments. Such deployment will not only be critical towards achieving the net zero target, given the important contribution that wind energy will make in that regard, but will also help deliver the Government's clear green infrastructure mission.

The Onshore Wind Policy Statement (2022)

- 5.154 The Onshore Wind Policy Statement (OWPS, 2022) replaces the previous version published in 2017 and makes it explicitly clear that seeking greater security of supply and lower cost electricity are now key drivers alongside the need to deal with the climate emergency. It requires a minimum installed capacity of 20GW of onshore wind by 2030, requiring an additional 12GW installed between 2023 and 2030.
- 5.155 The OWPS states that deployment of onshore wind is "mission critical for meeting our climate targets" as an "affordable and reliable source of electricity generation."

The Onshore Wind Sector Deal (2023)

- 5.156 The Onshore Wind Sector Deal, published in September 2023, provides a framework of commitments between Scottish Government and the onshore wind sector in order to support the rapid development and deployment of onshore wind, including the identification of barriers and potential solutions and actions to, for example, decrease consenting times. It is very clear that the Scottish Government wishes to see quicker deployment of onshore wind and is actively supporting the sector to do so.

Summary

- 5.157 This chapter outlines the key national and local planning policies, guidance and other material considerations that are relevant to the proposed development, and which inform the EIA Report and design.
- 5.158 To maintain the impartiality of the EIA Report, the chapter does not assess whether the proposed development would comply with the identified policies. A separate Planning Statement which assesses the compliance of the proposed development with the Development Plan and other material considerations is also submitted as part of the application. The Planning Statement is separate from the EIA Report.

Coille Linne Wind Farm

Environmental Impact Assessment Report Volume 1 Chapter 6: Landscape and Visual

June 2025

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* Additional LVIA Viewpoint added following feedback received at scoping.

(N) Night-time visualisation produced from this viewpoint in addition to day-time visualisation.

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Appendix 6.2: ZTV and Visualisation Information
Appendix 6.3: Preliminary Assessment of Landscape Character Types and Designations
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Version Control Sheet

Date	Version	Prepared by	Checked By	Comments
28 February 2025	R006v1	SCS/HS	DT	-
05 June 2025	R006v2	SCS/HS	DT	-
12 June 2025	R006v3	SCS/HS	DT	Client comments

6 LANDSCAPE AND VISUAL

Introduction

- 6.1 This chapter of the Environmental Impact Assessment Report (EIAR) presents a Landscape and Visual Impact Assessment (LVIA) of the proposed development. The purpose of an LVIA, when undertaken in the context of an Environmental Impact Assessment (EIA), is to identify any likely significant landscape and visual effects arising as a result of the proposed development. An LVIA must consider both:
- Effects on the landscape as a resource in its own right (the landscape effects); and
 - Effects on specific views and visual amenity more generally (the visual effects).
- 6.2 Therefore, this LVIA considers the potential effects of the proposed development upon:
- Individual landscape features and elements.
 - Landscape character.
 - Specific views; and
 - People who view the landscape.
- 6.3 In this chapter, landscape and visual effects are assessed separately; although, the procedure for assessing each of these is closely linked and follows 'The Guidelines for Landscape and Visual Impact Assessment, 3rd Edition' (GLVIA3)¹.
- 6.4 The main objectives of the landscape assessment can be summarised as follows:
- To identify, evaluate and describe the baseline landscape character of the Site and its surroundings and also any notable individual landscape features within the Site.
 - To determine the nature of the landscape receptor (i.e. the sensitivity of the landscape) through a consideration of its susceptibility to the type of development proposed and any values associated with it.
 - To identify and describe any impacts of the proposed development in so far as they affect the landscape resource.
 - To evaluate the nature of the landscape effects (i.e. the magnitude, duration, and reversibility of the effect).
 - To identify and describe mitigation measures that have been adopted to avoid, reduce, and compensate for landscape effects.
 - To evaluate the relative significance of residual landscape effects; and
 - To determine which landscape effects, if any, are significant.
- 6.5 The LVIA also considers any cumulative landscape and visual effects which may arise as a result of the proposed development in conjunction with other wind farm developments.

¹ Landscape Institute and the Institute for Environmental Management and Assessment (2013)
The Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3).

- 6.6 The main LVIA presented in this chapter is supported by figures and visualisations in **EIAR Volume 2**. NatureScot Visualisations are contained in **Volume 3**, with technical appendices presented in **Volume 4**. The Highland Council Visualisations can be found in **Volume 5**.
- 6.7 The location of the proposed development and the study area for the LVIA is illustrated on **Figures 6.1 and 6.2**. For reference, other operational, consented, in-planning, and scoping/pre-application wind farms within 45km - which are referred to throughout this chapter - are illustrated on **Figure 6.29**.
- 6.8 This chapter is structured as follows:
- Legislation, Policy, and Guidance.
 - Consultation.
 - Assessment Methodology and Significance.
 - Scope of Assessment.
 - Baseline Conditions.
 - Assessment of Potential Effects
 - Mitigation.
 - Assessment of Residual Effects.
 - Assessment of Cumulative Effects.
 - Summary.
- 6.9 Other relevant chapters include **Chapter 3: Project Description, Chapter 4: Design Evolution, Chapter 7: Cultural Heritage, and Chapter 14: Forestry**.
- 6.10 This chapter of the EIA Report has been prepared by Pegasus Group Limited (Pegasus). The Lead Author is Scott Cochran-Sharp, who is a Chartered Member of the Landscape Institute (CMLI). All work prepared has been peer reviewed by highly experienced and specialised staff at Pegasus.

Legislation, Policy, and Guidance

Legislation

European Landscape Convention, Adopted 2000

- 6.11 'The European Landscape Convention' (ELC)², is the first international convention to focus specifically on the landscape as a resource in its own right. The convention promotes landscape protection, management, and planning, as well as European co-operation on landscape issues. Signed by the UK Government in February 2006, the ELC became binding from March 2007. It applies to all landscapes, towns, and villages, as well as open countryside; the coast and inland areas; and ordinary or even degraded landscapes, as well as those that are afforded protection.
- 6.12 The UK Government has stated that it considers the UK to be compliant with the ELC's requirements and in effect the principal requirements of the ELC are already enshrined in

² Council of Europe (2000) Council of Europe Landscape Convention (ETS No.176). Available at: <https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treaty-num=176>

the existing suite of national policies and guidance on the assessment of landscape and visual effects.

6.13 The ELC defines landscape as:

“An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.”

6.14 It is important to recognise that the ELC does not require the preservation of all landscapes; although, landscape protection is one of the core themes of the convention. Equally important though is the requirement to manage and plan future landscape change.

6.15 The ELC highlights the importance of developing landscape policies dedicated to the protection, management, and planning of landscapes. In this regard, NatureScot and The Highland Council (THC) have a suite of landscape character assessments and landscape sensitivity studies which enables decisions to be made with due regard to landscape character, as promoted by the ELC.

Policy

6.16 **Chapter 5: Renewable Energy and Planning Policy** of the EIA Report sets out the planning policy framework that is relevant to the EIA process and the proposed development. The policies set out include those from The Highland Council Highland-wide Local Development Plan (HwLDP)³, relevant aspects of NPF4 (National Planning Framework 4) (2023)⁴, Planning Advice Notes and other relevant guidance.

National Planning Framework 4

6.17 The following planning policies were reviewed as part of the desk study for the LVIA.

- Policy 1: Tackling the Climate and Nature crisis.
- Policy 3: Biodiversity.
- Policy 4: Natural places.
- Policy 6: Forestry, woodland and trees.
- Policy 11: Energy.

6.18 Policy 4 (c): Natural places, states that where development proposals affect National Scenic Areas (NSA), they 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.”*

³ The Highland Council (2012) Highland-wide Local Development Plan. Available at: https://www.highland.gov.uk/info/178/development_plans/199/highland-wide_local_development_plan

⁴ Scottish Government (2023) National Planning Framework 4. Available at: <https://www.gov.scot/publications/national-planning-framework-4/>

6.19 With reference to Designated Landscapes in the LDP, Policy 4, 'd' states that development will only be supported where:

- *"i. Development will not have significant adverse effects on the integrity of the area or the qualities for which it has been identified; or*
- *ii. Any significant adverse effects on the integrity of the area are clearly outweighed by social, environmental or economic benefits of at least local importance."*

6.20 On Wild Land Areas, Policy 4, 'g' states that *"Buffer zones around wild land will not be applied, and effects of development outwith wild land areas will not be a significant consideration"*.

6.21 With regards to Policy 11: Energy, 'e' states:

"In addition, project design and mitigation will demonstrate how the following impacts are addressed:

- *"i. impacts on communities and individual dwellings, including, residential amenity, visual impact, noise and shadow flicker;*
- *ii. significant landscape and visual impacts, recognising that such impacts are to be expected for some forms of renewable energy. Where impacts are localised and/or appropriate design mitigation has been applied, they will generally be considered to be acceptable;*
- *iii. public access, including impact on long distance walking and cycling routes and scenic routes;*
- *iv. impacts on aviation and defence interests including seismological recording;*
- *v. impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised;*
- *vi. impacts on road traffic and on adjacent trunk roads, including during construction;*
- *vii. impacts on historic environment;*
- *viii. effects on hydrology, the water environment and flood risk;*
- *ix. biodiversity including impacts on birds;*
- *x. impacts on trees, woods and forests;*
- *xi. proposals for the decommissioning of developments, including ancillary infrastructure, and site restoration;*
- *xii. the quality of site restoration plans including the measures in place to safeguard or guarantee availability of finances to effectively implement those plans; and*
- *xiii. cumulative impacts."*

6.22 It is noted that there are a number of other policies of particular relevance to landscape and visual matters. In particular, these include Policy 11 of NPF4 and specifically section 'e' ii, which states that *"Where impacts are localised and/or appropriate design mitigation has been applied, they will generally be considered to be acceptable"*. Whilst there is no definition of 'localised' set out in NPF4, it is considered that localised relates to not just the distance to which significant effects would occur, but also the type of landscape, the scale of the proposed development and the number of receptors who may be impacted by significant effects. In this context it is considered that the proposed development only gives rise to localised landscape and visual effects, and this is demonstrated in the assessments set out in subsequent sections of this chapter. It is also considered that

appropriate design mitigation has been applied, which is discussed in the wider application submission material.

Highland-wide Local Development Plan (HwLDP)

6.23 The following planning policies were reviewed as part of the desk study for the LVIA:

- Policy 67: Renewable Energy Development.
- Policy 36: Development in the wider countryside.
- Policy 57: Natural Built and Cultural Heritage.
- Policy 61: Landscape.
- Policy 77: Public Access.
- Policy 78: Long Distance Routes.

Caithness and Sutherland Local Development Plan (CaSPlan)

6.24 The Caithness and Sutherland Local Development Plan (CaSPlan)⁵ was also reviewed as part of the desk study for the LVIA.

6.25 As the CaSPlan is focussed primarily on regional and settlement strategies as well as identifying specific site allocations, it is considered to have minimal relevance with respect to the proposed development.

Supplementary Guidance

6.26 The following supplementary guidance and technical reports which provide the evidence base for current planning policy were also reviewed:

- The Highland Council Onshore Wind Supplementary Guidance⁶ and Addendum⁷ (OWESG).
- Assessment of Highland Special Landscape Areas⁸.
- NatureScot Assynt - Coigach NSA description and special qualities⁹.
- NatureScot Dornoch Firth NSA description and special qualities¹⁰.
- NatureScot Kyle of Tongue NSA description and special qualities¹¹.

⁵ The Highland Council (2018) Caithness and Sutherland Local Development Plan. Available at: https://www.highland.gov.uk/info/178/development_plans/283/caithness_and_sutherland_local_development_plan

⁶ The Highland Council (2016) Onshore Wind Energy: Supplementary Guidance. Available at: https://www.highland.gov.uk/downloads/download/165/onshore_wind_energy_supplementary_guidance

⁷ The Highland Council (2017) Landscape Sensitivity Appraisal: Black Isle, Surrounding Hills and Moray Firth Coast Caithness. Available at: https://www.highland.gov.uk/downloads/download/165/onshore_wind_energy_supplementary_guidance

⁸ Horner + Maclellan with Mike Wood (2011) Assessment of Highland Special Landscape Areas. Commissioned by The Highland Council in partnership with Scottish Natural Heritage

⁹ NatureScot (2010) Assynt - Coigach NSA. Available at: <https://sitelink.nature.scot/site/9119>

¹⁰ NatureScot (2010) Dornoch Firth NSA. Available at: <https://sitelink.nature.scot/site/9122>

¹¹ NatureScot (2010) Kyle of Tongue NSA. Available at: <https://sitelink.nature.scot/site/9133>

- NatureScot North-West Sutherland NSA description and special qualities¹².
- NatureScot Rhiddoroch – Beinn Dearg – Ben Wyvis Wild Land Area description¹³.
- NatureScot Inverpolly - Glencanisp Wild Land Area description¹⁴.
- NatureScot Quinag Wild Land Area description¹⁵.
- NatureScot Reay - Cassley Wild Land Area description¹⁶.
- NatureScot Ben Klibreck - Armine Forest Wild Land Area description¹⁷.
- NatureScot Causeymire - Knockfin Flows Wild Land Area description¹⁸.
- NatureScot Foinaven - Ben Hee Wild Land Area description¹⁹.
- NatureScot Ben Hope – Ben Loyal Wild Land Area description²⁰.
- NatureScot Cape Wrath Wild Land Area description²¹.

Consultation

- 6.27 Throughout the planning application and the EIA scoping process, and subsequently during the ongoing EIA process, relevant organisations were contacted with regards to the proposed development.
- 6.28 Consultation relevant to the LVIA was undertaken with THC regarding methodology, sources of information, viewpoint selection, scope of assessment, and cumulative development. Following the EIA scoping process, further consultation was sought with THC to confirm agreement on LVIA viewpoints and different parts of the assessment through email correspondence; although, it should be noted that no confirmation email was

¹² NatureScot (2010) North-West Sutherland NSA. Available at: <https://sitelink.nature.scot/site/9144>

¹³ NatureScot (2017) Description of Wild Land Area: 29 Rhiddoroch – Beinn Dearg – Ben Wyvis. Available at: <https://www.nature.scot/sites/default/files/2021-06/Wild%20land%20Description%20Rhiddoroch-Beinn%20Dearg-Ben-Wyvis-July-2016-29.pdf>

¹⁴ NatureScot (2017) Description of Wild Land Area: 32 Inverpolly - Glencanisp. Available at: <https://www.nature.scot/sites/default/files/2021-06/Wild%20land%20Description%20Inverpolly-Glencanisp-July-2016-32.pdf>

¹⁵ NatureScot (2017) Description of Wild Land Area: 33 Quinag. Available at: <https://www.nature.scot/sites/default/files/2021-06/Wild%20land%20Description%20Quinag-July-2016-33.pdf>

¹⁶ NatureScot (2017) Description of Wild Land Area: 34 Reay - Cassley. Available at: <https://www.nature.scot/sites/default/files/2021-06/Wild%20land%20Description%20Reay-Cassley-July-2016-34.pdf>

¹⁷ NatureScot (2017) Description of Wild Land Area: 35 Ben Klibreck - Armine Forest. Available at: <https://www.nature.scot/sites/default/files/2021-06/Wild%20land%20Description%20Ben-Klibreck-Armine-Forest-July-2016-35.pdf>

¹⁸ NatureScot (2017) Description of Wild Land Area: 36 Causeymire - Knockfin Flows. Available at: <https://www.nature.scot/sites/default/files/2021-06/Wild%20land%20Description%20Causeymire-Knockfin-Flows-July-2016-36.pdf>

¹⁹ NatureScot (2017) Description of Wild Land Area: 37 Foinaven - Ben Hee. Available at: <https://www.nature.scot/sites/default/files/2021-06/Wild%20land%20Description%20Foinaven-Ben-Hee-July-2016-37.pdf>

²⁰ NatureScot (2017) Description of Wild Land Area: 38 Ben Hope – Ben Loyal. Available at: <https://www.nature.scot/sites/default/files/2021-06/Wild%20land%20Description%20Ben-Hope-Ben-Loyal-July-2016-38.pdf>

²¹ NatureScot (2015) Description of Wild Land Area: 40 Cape Wrath. Available at: <https://www.nature.scot/sites/default/files/2021-08/Wild%20land%20description%20-%2040%20Cape%20Wrath%20WLA.pdf>

received from THC at the time of writing. **Table 6.1: Consultation Responses** below outlines the consultation responses received in relation to landscape and visual matters.

Table 6.1: Consultation Responses

Date Received	Details	Consultation Response	Where and how is this addressed
Energy Consents Unit (ECU)			
Scoping Opinion (13 September 2024)	Aviation Lighting	<i>"It is recommended by the Scottish Ministers that with regards to impacts of night time aviation lighting, the Company should discuss and agree with the Highland Council and NatureScot the range (in kilometres from the proposed Development) for hours of darkness assessments of the impacts of aviation lighting and receptors therein to be assessed.</i> <i>As well as the scope, methodology, findings and recommendations of such assessments, full details of all mitigation of aviation lighting impacts subsequently identified should be provided in the EIA report."</i>	The LVIA considers the effects of aviation lighting during dark sky hours on all visual receptors, with the assessment carried out in accordance with Annex 1 of NatureScot pre-application guidance for onshore wind farms. Night-time visualisations have been provided from Viewpoint 1: A838 near Fiag Bridge, Viewpoint 3: A838 near Overscaig Hotel, Viewpoint 14: A836 near An t-Sron, and Viewpoint 16: Torroble
	Cumulative impact assessments	<i>"To ensure that cumulative impact assessments are as up-to-date as possible, other Developments to be included should be discussed and agreed by the Company and the Highland Council. Assessments, photography and visualisations submitted in the EIA report should reflect the most up-to-date cumulative position."</i>	The main LVIA (this chapter) includes an assessment of cumulative effects (see LVIA section Assessment of Cumulative Effects).
	Landscape and visual – study area	<i>"The study area in kilometres of the proposed Development should be agreed following discussion between the Company, NatureScot and the Highland Council."</i>	Following the EIA Scoping exercise, the initial LVIA study area and cumulative study area was increased to 45km in response to the feedback from consultees (as set out in subsequent sections of this chapter and as shown on LVIA Figures 6.1 – 6.36).

Date Received	Details	Consultation Response	Where and how is this addressed
	Viewpoints and visualisations	<i>"The final list of viewpoints and visualisations should be agreed following discussion between the Company, the Highland Council, NatureScot and Mountaineering Scotland."</i>	Additional LVIA viewpoint requests made in scoping responses from THC were reviewed. An additional daylight and darkness hours LVIA viewpoint at Torroble has been added as requested by THC (see Viewpoint 16: Torroble). A wireline has been provided from the summits of Beinn Leoid, Ben Hope, Ben Loyal, and Carn a Choin Deirg, as requested by THC (see LVIA Viewpoints A-D).
	Mitigation Measures	<i>"The mitigation measures suggested for any significant environmental impacts identified should be presented as a conclusion to each chapter in the EIA report."</i>	The main LVIA (this chapter) includes a section of mitigation measures (see LVIA section Mitigation Measures and Monitoring).
The Highland Council (THC)²²			
Scoping Opinion (13 September 2024)	Photomontages	<i>"Photomontages should follow the Council's Visualisation Standards and are subject an independent verification check upon receipt"</i>	Visualisations to Highland Council Visualisation Standards are provided in Volume 5 – The Highland Council Visualisations .

²² The Applicant also received pre-application advice from The Highland Council (dated 16 October 2024). As the advice given was largely similarly to the advice presented in the EIA scoping opinion response (dated 13 September 2024), detail has only been included in Table 6.1 where it was considered to provide further advice beyond that provided in the EIA scoping opinion response

		<i>"Separate volumes of visualisations should be prepared to both Highland Council Standards and NatureScot guidance."</i>	Visualisations to NatureScot and Highland Council Visualisation Standards are provided in Volume 3 - NatureScot Visualisations, and Volume 5 – The Highland Council Visualisations , accordingly.
		<i>"All elements of a development are important to consider within any EIAR and the assessment must include the expected landscape and visual impact of on-site BESS, borrow pits, access roads, compounds including substations and battery storage, this is despite the fact that the principal structures will be a primary concern. All elements of the proposal are to be rendered into photomontages"</i>	The wind turbines will be the most conspicuous element of the proposed development and other elements such as tracks, battery units, substation etc. would be relatively diminutive in views from many of the proposed LVIA viewpoints. Therefore, other project elements have been modelled into photomontages from LVIA viewpoints situated within 5km of the proposed development where such elements would be visible.
	Viewpoint Locations	<i>"The Council is generally satisfied with the VPs selected but would request visualisations from Ben Hope within the Kyle of Sutherland National Scenic Area, and a further visualisation from the elevated road at Torroble (see OS Grid reference NC 59167 04228) to understand impacts at the housing groups near Lairg. Furthermore, for reasons set out in the Special Landscape Area paragraph below, a visualisation from Càrn a' Choin Deirg will be required. Please note that THC's Landscape Officer will provide further advice for the aforementioned PREMAJ in due course, which is likely to provide further detail on landscape, visual, and visualisation matters."</i>	An additional daylight and darkness hours LVIA viewpoint at Torroble has been added as requested by THC (see Viewpoint 16: Torroble). Given the distances from the Site, the limited potential for significant effects, and the proposed inclusion of similar LVIA viewpoints, wirelines have been provided from the summits of Beinn Leoid, Ben Hope, Ben Loyal, and Carn a Choin Deirg (see LVIA Viewpoints A-D).

	Study Area	<i>"The Study Area will be 45km, given the scale of the turbines. Given the size of the turbines and the landscape sensitivities of this site and the surrounding area, we would expect a detailed assessment of effects should be undertaken for the whole Study Area, including for Cumulative Impact Assessment, which should also include an assessment of sequential effects as the receptor moves through the landscape."</i>	The initial LVIA study area and cumulative study area was increased to 45km in response to the feedback from THC. Whilst THC requested exclusion of a 20km detailed study area; following site visits and early analysis, a 20km detailed study area was reinstated, as it is judged that significant effects would not occur beyond a 20km distance from the Site.
	Methodology	<i>"the LVIA Chapter of the EIAR should clearly set out the methodology"</i>	The detailed assessment criteria used to determine landscape and visual sensitivity, magnitude of change and significance of effect are set out in Technical Appendix 6.1: Landscape and Visual Impact Assessment Criteria . The approach to the assessment of cumulative effects is set out in the main LVIA (this chapter). The approach to the residential visual amenity assessment is set out in Technical Appendix 6.6: Residential Visual Amenity Assessment (RVAA) . The approach to the assessment of effects on Special Landscape Qualities of the NSA is set out in Technical Appendix 6.7: Assessment of Effects on Special Landscape Qualities and the approach to the assessment of visible aviation lighting is set out in Technical Appendix

			6.8: Assessment of Night-time Lighting: Assessment Criteria and Methodology.
	Assessment of recreational routes	<i>"When assessing the impact on recreational routes please ensure that all core paths, rights of way, national cycle network, and long distance trails are assessed. It should be noted that these routes are used by a range of receptors."</i>	A preliminary assessment of all routes within the 20km detailed LVIA study area has been included at Technical Appendix 6.4: Preliminary Assessment of Visual Receptors. Those routes where receptors have the potential to experience significant effects have been assessed in detail in subsequent sections of this chapter.
	OWESG Criterion	<i>"We expect the Landscape Impact Assessment to refer to the Council's Onshore Wind Energy Supplementary Guidance and expect an assessment of the proposal against the criterion set out in the Council's OWESG at pages 19 and 20 to be included within the LVIA chapter of the EIAR."</i>	An assessment of the proposal against the Criterion is included within the accompanying Planning Statement.
	Landscape Impact Assessment	<i>"We advise that wind energy developments are generally sited within a complex combination of Landscape Character Types. As such, the Landscape Impact Assessment's analysis should not only focus on potential impacts on individual Landscape Character Types and individual Units, but also on the local landscape character composition within which these elements come together to define a particular sense of Place."</i>	The main LVIA (this chapter) includes an assessment of effects on landscape character in accordance with The Guidelines for Landscape and Visual Impact Assessment Third Edition (GLVIA3) – see section Identification and Evaluation of Key Effects.

	Landscape Designations	<i>"any assessments of Special Landscape Areas (SLA) including Ben Klibreck and Loch Choire SLA, and Fannichs, Beinn Dearg and Glencalvie SLA must be undertaken using the SLA citations available from the Council's website. The assessment should include consideration of intervisibility between the SLAs and to that end, a visualisation from Càrn a' Choin Deirg within the latter SLA will be required."</i>	A preliminary assessment of all Landscape Designations within the 20km detailed LVIA study area has been included at Technical Appendix 6.3: Preliminary Assessment of Landscape Character Types and Designations. Those designations identified as having the potential to experience significant effects have been assessed in detail in subsequent sections of this chapter. A wireline has been provided from the summit of Carn a Choin Deirg (see LVIA Viewpoint D).
	Effects of aviation lighting	<i>"As the heights of the proposed turbines are above 150m, aviation lighting is required. Further advice on aviation lighting is available from NatureScot however generally the impact of aviation lighting on WLAs and SLAs and areas where there would be an expectation of dark skies should be included. THC generally prefers the term 'Hours of Darkness' over 'Night-Time' in recognition of how extensive hours of darkness can be in the Highlands. It is pertinent to the assessment to understand that Hours of Darkness Effects will be visible during people's working day and commuting hours for a significant part of the year and that sensitivities of receptors to these effects must account for this. Therefore, Hours of Darkness VPs should be representative of commutes and communities, as well as Wild Land."</i>	The assessment of the effects of aviation lighting has been carried out in accordance with Annex 1 NatureScot pre-application guidance for onshore wind farms and NatureScot Guidance on Aviation Lighting Impact Assessment.

	Residential Visual Amenity Assessment	<i>"The residential visual amenity impact on sensitive properties occasioned by a wind farm with turbines of up to 230m tip height beyond 2km is unknown. The Council would suggest that a RVAA is not scoped out of the EIAR at this stage and that sensitive properties including the hotel are subject to a RVAA up to a minimum of 4km from the nearest turbine given the scale of the proposed turbines."</i>	A 4km study area has been used for the Residential Visual Amenity Assessment (RVAA) that accompanies the LVIA at Technical Appendix 6.6: Residential Visual Amenity Assessment (RVAA) .
Pre-application advice for major developments (16 October 2024)	Cumulative Effects	<i>"Given the current and evolving wind energy developments in this part of Highland the proposal has potential to have cumulative and sequential visual impacts along the A838, the A837 along with the road heading north of Rosehall scheme pulling wind farms further west on a popular recreational route. Additionally, there are various other recreational routes in the wider surrounding area that may be affected by the proposed development including core paths, long-distance trails and key views from surrounding upland summits such as Ben Klibreck and Ben Hee are fully assessed."</i>	A preliminary assessment of all routes within the 20km detailed LVIA study area has been included at Technical Appendix 6.4: Preliminary Assessment of Visual Receptors . Those routes where receptors have the potential to experience significant effects have been assessed in detail in subsequent sections of this chapter. Key views have been considered in the viewpoint assessment presented in Technical Appendix 6.5: Viewpoint Assessment .
	Landscape and Visual Effects	<i>"Highland Council's Landscape Officer notes potential visibility of the proposed development extending into the Ben Klibreck and Loch Choire Special Landscape Area which would have both visibility of the development and be seen as a backdrop to the development. As such, the development has the potential to affect the Key Landscape and Visual Characteristics for the SLA. The ZTV also extends into the boundaries of North West Sutherland and Assynt-Coigach National Scenic Areas. The Special Qualities for both National Scenic Areas</i>	A preliminary assessment of all Landscape Designations within the 20km detailed LVIA study area has been included at Technical Appendix 6.3: Preliminary Assessment of Landscape Character Types and Designations . Those designations identified as having the potential to experience significant effects have been assessed

		reference a lack of apparent human activity and lack of movement in the landscape as defining elements of the area and the importance of the scale of the landscape. As such, the Landscape Officer considered the proposed development may effect perceptions of encroaching human influence and introduce of a new element in motion in the landscape and for the perceived scale of the mountains to be diminished in views where they are seen in the backdrop to the development. Ultimately, in both landscape and visual terms the success of the proposal will be measured by the extent to which it works in harmony with surrounding development and avoids unnecessary landscape and visual effects bearing in mind that any such effects are likely to extend into the hours of darkness by virtue of aviation lighting."	in detail in subsequent sections of this chapter. A detailed analysis of potential effects on the Special Qualities of the Assynt-Coigach NSA is further presented in Technical Appendix: 6.7: Assessment of Effects on Special Landscape Qualities. The LVIA considers the effects of aviation lighting during dark sky hours on all visual receptors, with the assessment carried out in accordance with Annex 1 of NatureScot pre-application guidance for onshore wind farms. Night-time visualisations have been provided from Viewpoint 1: A838 near Fiag Bridge, Viewpoint 3: A838 near Overscaig Hotel, Viewpoint 14: A836 near An t-Sron, and Viewpoint 16: Torroble.
NatureScot			
Scoping Opinion (26 August 2024)	Impacts on the Flow Country World Heritage Site (WHS)	"Assessment of impacts to the WHS only needs to consider criterion (ix) for peatland ecosystem quality, as this reflects UNESCO's decision."	Whilst the Flow Country influences the landscape baseline, and therefore the assessment of potential effects, the WHS is not a landscape protection designation, nor does it have any statutory status in this regard. Where relevant, potential effects are considered further within Chapter 8: Ecology.

	Landscape and Visual	<i>"Having reviewed the supporting information for the proposed development, we do not consider that it would raise issues of National Interest in relation to its landscape, visual or cumulative effects. This is not to say that the development would not result in significant landscape or visual effects, rather that NatureScot does not judge these effects to meet our threshold in respect of our national remit for landscapes."</i>	Noted. This advice has been taken forward into the main LVIA (included in this chapter).
	Guidance documents	<i>"We recommend the applicants and their consultants review the document "NatureScot pre-application guidance for onshore wind farms"</i>	Noted. This advice has been taken forward into the main LVIA (included in this chapter).
Mountaineering Scotland			
Scoping Opinion (18 July 2024)	Assessment	<i>"Mountaineering Scotland's concern at this stage is ensuring that the proposed viewpoints will allow a comprehensive assessment of the proposed development from a mountaineering/hillwalking perspective should an application be made, specifically towards Ben More Assynt, Ben Leoid and Ben Hee, or northeast into the Ben Armine Forest. We endorse the proposed upland viewpoints suggested in the Scoping Report: VP2, VP6, VP7, VP10, VP12, VP13, which we think are sufficient for a proper assessment of visual impact on hillwalkers."</i>	Noted. This advice has been taken forward into the main LVIA (included in this chapter).

Assessment Methodology and Significance

- 6.29 The primary source of best practice for LVIA in the UK is the Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3).
- 6.30 The LVIA presented in this chapter has been undertaken in accordance with the principles established in this document. It must however be acknowledged that GLVIA3 establishes guidelines not a specific methodology. The preface to GLVIA3 recognises that:

"This edition concentrates on principles and processes. It does not provide a detailed or formulaic 'recipe' that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand."

6.31 The methodology for this assessment has therefore been developed specifically for this LVIA to ensure that it is appropriate and fit for purpose.

6.32 Consideration has also been given to the following documents:

- Landscape Institute Technical Guidance Note 2/19 Residential Visual Amenity Assessment (RVAA)²³.
- Landscape Institute Technical Guidance Note 06/19 Visual Representation of Development Proposals²⁴.
- Landscape Institute Technical Guidance Note 02/21 Assessing landscape value outside of national designations²⁵.
- Landscape Institute Technical Guidance Note LITGN-2024-01 Notes and Clarifications on Aspects of Guidelines for Landscape and Visual Impact Assessment Third edition (GLVIA3)²⁶.
- NatureScot Landscape Sensitivity Assessment Guidance (Methodology)²⁷.
- NatureScot Guidance Assessing the cumulative landscape and visual impact of onshore wind energy developments²⁸.
- NatureScot pre-application guidance for onshore wind farms²⁹.
- NatureScot General pre-application and scoping advice for onshore wind farms³⁰.
- NatureScot Guidance on Aviation Lighting Impact Assessment³¹.
- NatureScot Special Landscape Qualities - Guidance on assessing effects³².

²³ Landscape Institute (2019) Technical Guidance Note 2/19 Residential Visual Amenity Assessment (RVAA). Available at: <https://www.landscapeinstitute.org/technical-resource/li-technical-notes/>

²⁴ Landscape Institute (2019) Technical Guidance Note 06/19 Visual Representation of Development Proposals. Available at: <https://www.landscapeinstitute.org/technical-resource/li-technical-notes/>

²⁵ Landscape Institute (2021) Technical Guidance Note 02/21 Assessing landscape value outside of national designations. Available at: <https://www.landscapeinstitute.org/technical-resource/>

²⁶ Landscape Institute (2024) Institute Technical Guidance Note LITGN-2024-01 Notes and Clarifications on Aspects of Guidelines for Landscape and Visual Impact Assessment Third edition (GLVIA3). Available at: <https://www.landscapeinstitute.org/technical/glvia3-panel/>

²⁷ NatureScot (2022) Landscape Sensitivity Assessment Guidance (Methodology). Available at: <https://www.nature.scot/doc/landscape-sensitivity-assessment-guidance-methodology>

²⁸ NatureScot (2021) Guidance Assessing the cumulative landscape and visual impact of onshore wind energy developments. Available at: <https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments>

²⁹ NatureScot (2024) NatureScot pre-application guidance for onshore wind farms. Available at: <https://www.nature.scot/doc/naturescot-pre-application-guidance-onshore-wind-farms>

³⁰ Nature Scot (2024) NatureScot pre-application guidance for onshore wind farms. Available at: <https://www.nature.scot/doc/naturescot-pre-application-guidance-onshore-wind-farms>

³¹ NatureScot (2024) Guidance on Aviation Lighting Impact Assessment. Available at: <https://www.nature.scot/doc/guidance-aviation-lighting-impact-assessment>

³² NatureScot (January 2025) Special Landscape Qualities - Guidance on assessing effects. Available at: <https://www.nature.scot/doc/special-landscape-qualities-guidance-assessing-effects>

- Scottish Natural Heritage Guidance Siting and Design of Wind farms in the Landscape, Version 3a³³.
- Scottish Natural Heritage Guidance Visual Representation of Wind Farms, Version 2.2³⁴.
- The Highland Council Visualisation Standards for Wind Energy Developments³⁵.

Scope of Assessment

- 6.33 The LVIA assesses both the long-term effects relating to the operational lifetime of the proposed development and the short-term temporary effects associated with the construction of the proposed development.
- 6.34 Where appropriate, the LVIA also considers any residual effects once the proposed turbines have been decommissioned and removed (assumed to be 35 years from the commencement of operation).
- 6.35 The LVIA considers both direct and indirect landscape and visual effects. It not only assesses the impacts associated with the turbines but also any related impacts resulting from the construction compound, borrow pits, underground cabling, site tracks, substation, energy storage facility, and access roads.
- 6.36 Consideration has been given to the movement of the turbine blades, along with seasonal variations when assessing the visibility of the proposed development.
- 6.37 The LVIA also considers any cumulative effects arising in conjunction with other wind farm developments in the study area, as set out in subsequent sections of this chapter. Best practice guidelines identify two principal types of cumulative visual impact:
- Combined visibility – where the observer is able to see two or more developments from one viewpoint; and
 - Sequential visibility – where two or more developments are not visible at one location but would be seen as the observer moves along a linear route, for example, a road or public right of way.
- 6.38 The guidelines state that 'combined visibility' may either be 'in combination' (where two or more developments are visible from a fixed viewpoint in the same arc of view) or 'in succession' (where two or more developments are visible from a fixed viewpoint, but the observer is required to turn to see the different sites). Both types are discussed in this LVIA. The published GLVIA3 also indicates a difference in emphasis between sequential effects that are frequent and those which are occasional.
- 6.39 The primary purpose of the cumulative impact assessment is to consider the additional effects that might arise as a result of the proposed development if the other consented and in-planning (awaiting determination) developments were also operational. In

³³ SNH (2017) Guidance Siting and Design of Wind farms in the Landscape, Version 3a. Available at: <https://www.nature.scot/doc/siting-and-designing-wind-farms-landscape-version-3a>

³⁴ SNH (2017) Guidance Visual Representation of Wind Farms, Version 2.2. Available at: <https://www.nature.scot/doc/visual-representation-wind-farms-guidance>

³⁵ The Highland Council (2016) Visualisation Standards for Wind Energy Developments. Available at: https://www.highland.gov.uk/downloads/file/12880/visualisation_standards_for_wind_energy_developments

addition, the cumulative assessment also includes a further consideration of the overall totality of the effect, when the proposed development is considered alongside the other operational or in-planning developments across the study area. Some consideration has also been given to any scoping/ pre-application developments in the study area.

- 6.40 In relation to both the effects of the proposed development alone and the cumulative effects with other wind farm developments in the study area, both beneficial (positive) and adverse (negative) effects are considered. Wind farms give rise to a wide spectrum of opinions, ranging from strongly negative to strongly positive, with a wide range of opinions lying somewhere between these two positions. Some people view turbines as incongruous or industrial structures whilst others view them as aesthetically pleasing, elegant structures, and a positive response to climate change. This spectrum of opinion has come to be referred to in relation to wind farms as the concept of valency.
- 6.41 For the avoidance of doubt, in considering the effects of the proposed development, a precautionary approach to the assessment has been adopted and it is assumed that, unless specifically stated otherwise, the effects of the proposed development would be adverse in nature even though it is acknowledged that, for some people, the impacts could be considered to be beneficial.

Study Area

- 6.42 The initial study area for the LVIA is 45km radius from the turbines in all directions, as agreed with THC. The extent of this study area is illustrated in **Figure 6.1**. Initial site work informed by analysis of preliminary ZTVs and wirelines from the agreed viewpoint locations indicated that any significant landscape and visual effects are likely to occur within a much narrower radius from the Site; therefore, the level of assessment work in this LVIA incrementally decreases with distance from the Site, with the greatest focus of assessment being within broadly 20km of the Site. The intention is that the detail of the LVIA remains proportional to the likely significance of effects, as advocated in GLVIA3.
- 6.43 In terms of cumulative effects, the intention has again been that assessment work is proportional to the likelihood of significant effects arising. The approach adopted in the cumulative LVIA has been to focus on other wind farms which are either operational, under construction, consented, subject to a full planning application, or that have received a scoping opinion response. Furthermore, the approach has been to focus the assessment on other wind farm developments which have the potential to give rise to significant cumulative effects. Further details of this approach are set out in subsequent sections of this chapter.

Effects Assessed in Full

- 6.44 **Table 6.2** presents the receptors/ matters that are scoped in for further assessment, together with appropriate justification. Where a change has occurred since EIA scoping, this is clearly stated and justified.

Table 6.2: Receptors/ Matters Scoped in for Further Assessment

Receptors/ Matters	Phase	Justification	Change Since EIA Scoping?
Landscape features within the Site	All phases	Due to the potential direct effects resulting from the proposed development	No change.
Landscape character within the proposed detailed 20km LVIA study area	All phases	Due to the potential for direct and indirect landscape effects resulting from the proposed development	No change. THC requested exclusion of a 20km detailed study area and inclusion of a 45km study area; however, following site visits and early analysis, a 20km detailed study area was reinstated, as it is judged that significant effects upon landscape character would not occur beyond 20km.
Visual amenity within the proposed detailed 20km LVIA study area	All phases	Due to the potential for visual landscape effects resulting from the proposed development	No change. THC requested exclusion of a 20km detailed study area and inclusion of a 45km study area; however, following site visits and early analysis, a 20km detailed study area was reinstated, as it is judged that potential for significant effects upon visual amenity would not occur beyond 20km.
Effects on visual receptors resulting from the proposed aviation lighting	Operation	The assessment of turbine lighting will consider the additional visual effects introduced by the proposed aviation lights. The assessment has been informed by a ZTV of the lit turbines out to 20km, a turbine lighting intensity ZTV to 2 km and night-time visualisations prepared from Viewpoints 1, 3, 14, and 16	An additional dark sky visualisation has been prepared from Viewpoint 16: Torroble as requested by THC.

Cumulative effects	All phases	The assessment of cumulative effects has considered effects on landscape character and visual amenity with other operational, approved/under construction or in-planning wind farms	No change. THC requested exclusion of a 20km detailed study area and inclusion of a 45km study area; however, following site visits and early analysis, a 20km detailed study area was reinstated, as it is anticipated that potential cumulative significant effects would not occur beyond 20km.
Residential visual amenity	Operation	Exclusion of a RVAA as no properties located within 2km of a proposed turbine	THC requested inclusion of a RVAA to determine whether residents in properties within 4km of the proposed development would experience a significant visual effect from their dwelling, curtilage or principal access.

Effects Scoped Out

6.45 **Table 6.3** below presents the receptors/ matters that are scoped out of further assessment, together with appropriate justification. Where a change has occurred since EIA scoping, this is clearly stated and justified.

Table 6.3: Receptors/ Matters Scoped out for Further Assessment

Receptors/ Matters	Phase	Justification	Change Since EIA Scoping?
Effects on receptors located outside of the ZTV	All phases	The proposed development would not result in any effects where there is no predicted visibility	No change.
All receptors	Decommissioning	The effects experienced during decommissioning would be slightly less than those experienced during construction as decommissioning activities would use existing hardstandings and tracks	No change.

Effects on LCTs outside of the proposed detailed 20km LVIA study area	All phases	There would be no potential for indirect significant effects due to the distance from the proposed development	No change. THC requested exclusion of a 20km detailed study area and inclusion of a 45km study area; however, following site visits and early analysis, a 20km detailed study area was reinstated, as it is judged that significant effects upon landscape character would not occur beyond 20km.
Effects on Designated Landscapes outside of the proposed detailed 20km LVIA study area	All phases	There would be no potential for indirect significant effects due to the distance from the proposed development	No change. THC requested exclusion of a 20km detailed study area and inclusion of a 45km study area; however, following site visits and early analysis, a 20km detailed study area was reinstated, as it is judged that significant effects upon Designated Landscapes would not occur beyond 20km.
Effects on wild land	All phases	The Site is not located within an area of wild land. As a result, no assessments are required as Policy 4 (g) of NPF4 states that <i>"Buffer zones around wild land will not be applied and effects of development outwith wild land areas will not be a significant consideration."</i>	No change.
Effects on landscape character resulting from the proposed aviation lighting	Operation	It has been established in recent appeal decisions that the effects of visible aviation lighting is <i>"wholly a visual concern"</i> and that <i>"It is noted that the Reporters conclude that proposed aviation lighting would be a visual impact alone and consider that without being able to see and fully appreciate the features of the landscape and the</i>	No change.

		<i>composition of views, it is not possible to carry out a meaningful landscape character assessment. The Scottish Ministers concur with this conclusion. The detail is set out at paragraph 4.141 to 4.154 of the PLI Report."</i> (The Scottish Government. Crystal Rig IV Decision Letter. Dated 22 January 2021) ³⁶	
Effects on settlements outside of the proposed detailed 20km LVIA study area	All phases	Due to the distance from the proposed development and the very limited theoretical visibility, there is no potential for receptors in these settlements to experience significant visual effects	No change.
Effects on core paths outside of the proposed detailed 20km LVIA study area	All phases	Due to the distance from the proposed development and the limited theoretical visibility, there is no potential for users of these core paths to experience significant visual effects	No change.
Effects on long-distance walking routes outside of the proposed detailed 20km LVIA study area	All phases	Due to the distance from the proposed development and the limited theoretical visibility, there is no potential for users of long-distance walking routes to experience significant visual effects	No change.

³⁶ The Scottish Government (2021) Crystal Rig IV Wind Farm (WIND-140-8). Reporter's Decision. Available at: <https://www.dpea.scotland.gov.uk/Document.aspx?id=732056>

Effects on roads outside of the proposed detailed 20km LVIA study area	All phases	Due to the distance from the proposed development and the limited theoretical visibility, there is no potential for users of these roads to experience significant visual effects	No change.

Landscape Assessment Methodology

- 6.46 A baseline landscape assessment was conducted to determine the current features and character of the landscape within and surrounding the Site.
- 6.47 The baseline landscape assessment involved firstly a review of desk material including:
- Ordnance Survey maps at 1:250,000; 1:50,000; 1:25,000 and 1:10,000 scales.
 - Aerial photographs of the Site and surrounding area.
 - Topography.
 - Current and historical land use.
 - Geology and soil maps.
 - Historic Parks and Designated Landscapes.
 - Relevant planning policy.
 - Relevant landscape sensitivity/ capacity studies.
 - Relevant landscape character assessments.
 - Relevant Historic Landscape Character Assessments.
- 6.48 Field visits have been conducted in a variety of weather conditions and at various times of the year during the pre-application stage.
- 6.49 The baseline assessment identified the existing landscape features on the Site, and in the immediate vicinity, and how these elements combine to give the area a sense of landscape character. Plans and construction details of the proposed development were used to determine the potential impacts of the development on landscape features and character.
- 6.50 The LVIA firstly assesses how the proposed development would impact directly on any existing landscape features or elements (e.g. removal of trees etc.). The LVIA then considers impacts on landscape character with reference to landscape character areas/ types identified in published landscape character documents.

Visual Assessment Methodology

- 6.51 Potential visual receptors of the proposed development were identified by interpretation of digitally generated ZTVs (see **Technical Appendix 6.2: ZTV and Visualisation Information** for an explanation of how the ZTVs were produced).
- 6.52 A selection of viewpoints was identified and agreed with statutory consultees to represent a range of views and viewer types as discussed in Visual Representation of Wind farms – Version 2.2 (NatureScot) and in Paragraphs 6.16-6.20 of GLVIA3. The assessment viewpoints are listed in **Table 6.4: Assessment Viewpoints**.
- 6.53 The viewpoints cover a variety of different character areas, are in different directions from the Site, and are at varying elevations. Some of the viewpoints are intended to be representative of the visual experience in a general location whereas other viewpoints illustrate the view from a specific or important vantage point. The viewpoints are located at a range of distances from the proposed development to illustrate the varying magnitude of visual impacts.
- 6.54 Visualisations were produced for each of the viewpoints. NatureScot visualisations are presented in **Volume 3**, with THC Visualisations provided in **Volume 5**. An explanation of how they were produced and information to be read in conjunction with the visualisations is provided in **Technical Appendix 6.2: ZTV and Visualisation Information**.
- 6.55 Each of the representative viewpoints was visited to gain an understanding of the sensitivity of the viewpoint receptors and to make professional judgements on the likely visual effects arising from the proposed development.
- 6.56 The viewpoints were used as the starting point for considering the effects on visual receptors within the 20km detailed LVIA study area. The visual assessment does not rely solely on the viewpoint assessments to determine the significance of effects on different visual receptor groups throughout the study area. It should be recognised that the viewpoints illustrated in the LVIA simply represent a series of snapshots from a small selection of the locations within the study area from where the proposed development would be visible. Following the viewpoint assessment, the LVIA considers the effect on visual amenity throughout the study area with reference to different visual receptor groups at varying distances from the Site.

Assessment Criteria

- 6.57 The purpose of an LVIA when produced in the context of an EIA is to identify any significant landscape and visual effects within the study area to assist the determining authority in deciding the acceptability of the development under consideration.
- 6.58 In accordance with GLVIA3, the level (relative significance) of an effect is ascertained by considering in tandem the nature (sensitivity) of the baseline landscape or visual receptor and the nature (magnitude) of change as a result of the proposed development. These two judgements are described as very high, high, medium, low, or very low.
- 6.59 The relative significance of landscape or visual effects is described as **major, major/moderate, moderate, moderate/minor, or minor**. No effect may also be recorded where the effect is negligible. Professional judgement is then employed to determine whether the effect is significant or not. Those effects described as **major, major/moderate** and in some cases, **moderate**, may be regarded as significant.

- 6.60 The detailed assessment criteria used to determine landscape and visual sensitivity, magnitude of change and significance of effect are set out in **Technical Appendix 6.1: Landscape and Visual Impact Assessment Criteria**. The approach to the assessment of cumulative effects is set out in subsequent sections of this chapter. The approach to the residential visual amenity assessment is set out in **Technical Appendix 6.6: Residential Visual Amenity Assessment (RVAA)**. The approach to the assessment of effects on Special Landscape Qualities of the Assynt Coigach NSA is set out in **Technical Appendix 6.7: Assessment of Effects on Special Landscape Qualities** and the approach to the assessment of visible aviation lighting is set out in **Technical Appendix 6.8: Assessment of Night-time Lighting: Assessment Criteria and Methodology**.

Assessment Limitations

- 6.61 The assessment of effects within this LVIA has been derived through the use of publicly available information only. Within such a large study area it is unfeasible to visit every individual location from which the proposed development might be visible as illustrated on the ZTVs. The authors of the LVIA have, however, spent a considerable length of time 'in the field' and visited all important viewpoints and locations within the detailed 20km LVIA study area.
- 6.62 Limitations to the use of ZTVs and in relation to photography, wirelines, and photomontages is set out in **Technical Appendix 6.2: ZTV and Visualisation Information**.

Baseline Conditions

- 6.63 For the avoidance of doubt all distances are approximate and have been measured from the receptor to the nearest proposed turbine unless otherwise stated.

Current Baseline

Site Location

- 6.64 The Site, which is actively managed for commercial coniferous forestry, lies in the Sutherland area of the Highlands.
- 6.65 The closest densely populated settlement: the village of Lairg, lies approximately 21.9km³⁷ to the south-east. Residences are largely limited to scattered properties, or small property clusters such as at Overscaig, Shinness, Achnairn, Tirryside, and Altnaharra. The closest property is located approximately 3km from the nearest proposed turbine. The former Overscaig Hotel (now a dwelling) is sited close to the shoreline of Loch Shin over 3km west of the nearest proposed turbine.
- 6.66 The topography of the Site is undulating, with the lowest points being located along the roadside of the A838 as it passes Loch Shin. Land here extends to approximately 100m - 105m AOD. Land along the eastern boundary routes through Glen Fiag; following the course of the River Fiag as it flows into Loch Shin. The remainder of the Site broadly ascends to the peak of Meall Odhar (285m AOD), which is located near the north-western corner of the Site. The Site incorporates moorland and coniferous forestry associated with the Fiag Plantation.

³⁷ When measured from the centre point of the Site

- 6.67 A number of unnamed watercourses run in a generally easterly direction across the Site, draining into the River Fiag. The River Fiag drains into Loch Shin which lies approximately 1.2km from the Site boundary.
- 6.68 The nearest main highway is the A838 which runs adjacent to the southern boundary of the Site. The Site is accessed from the A838 near Fiag Bridge. The A838 is a major road in Sutherland which runs generally northwest from the A836 in the Lairg area to Tongue.
- 6.69 The Site lies approximately 7.5km to the south-west of the Creag Riabhach (22 turbines, 125m to tip) and Creag Riabhach Extension Wind Farm (3 turbines, 149.9m to tip). The consented Sallachy Wind Farm (9 turbines, 149.9m to tip) lies approximately 3km to the south-west of the Site, whilst the Shinness Wind Farm (16 turbines, 200m to tip) that is currently in the application stage is located approximately 5km to the north-west. A smaller individual turbine is present at Overscaig Hotel. The Site is further influenced by views of electricity pylons and poles carrying overhead lines.
- 6.70 The location of the Site is illustrated on **Figure 1.1a** and the layout of the Site with the proposed turbine locations and associated infrastructure shown on **Figure 3.1**.

Landscape Designations

- 6.71 A review of all landscape designations within the initial 45km LVIA study area has been undertaken. Landscape designations within 45km are illustrated on **Figure 6.10**, with those within 20km additionally shown on **Figure 6.11**.

International/National Landscape Designations

- 6.72 There are no national landscape designations covering the Site. As illustrated by **Figure 6.10**, there are a number of National Scenic Areas (NSA) within the 45km study area, namely:
- Assynt - Coigach NSA, approximately 9.5km to the west.
 - North – West Sutherland NSA, approximately 18km to the north-west.
 - Kyle of Tongue NSA, approximately 19km to the north-northeast.
 - Dornoch Firth NSA, approximately 33km to the south-east.
- 6.73 Effects on NSAs are considered within the preliminary assessment of LCTs and Designated Sites in **Technical Appendix 6.3** to determine which have the potential to experience significant effects and require detailed assessment. Of the NSAs located in the study area, the Assynt - Coigach NSA has been identified as the only one requiring further analysis and assessment. A brief description and outline of its special qualities is listed below, with a detailed assessment of potential effects on its special landscape qualities presented in **Technical Appendix 6.7**.

Assynt - Coigach NSA

- 6.74 The Assynt - Coigach NSA lies approximately 9.5km to the west of the Site at its closest point; extending beyond the western coast of Scotland. According to NatureScot³⁸, the NSA is described as *"Steep hills with idiosyncratic profiles rise from hummocky surroundings in some of the most rugged and spectacular scenery in Scotland."*
- 6.75 The description of the NSA goes on to state that *"To the east Ben More Assynt, lying east of the Moine Thrust, has a different character deriving from its different geological history. Its vaster bulk and wild, rugged grandeur form the backdrop to the drama of the peaks of Assynt and Coigach, mirrored as they are in tranquil weather in the lochs as Assynt, Veyatie, Sionascaig and Lurgainn."*
- 6.76 Assynt - Coigach NSA special qualities are listed as follows:
- *"Spectacular scenery of lone mountains*
 - *Rocky topography of great variety*
 - *Settlements nestled within a wider landscape of mountain peaks, wild moorlands, and rocky seascapes*
 - *Extensive cnocan landscapes*
 - *A coastline of endless drama*
 - *An intricate multitude of lochs and lochans*
 - *A landscape of vast open space and exposure*
 - *Significant tracts of wild land*
 - *Unexpected and extensive tracts of native woodland*
 - *A still, quiet landscape under a constantly changing sky"*

Local Landscape Designations

Local Landscape Areas

- 6.77 THC has identified 27no. Special Landscape Areas (SLAs), which it notes are landscapes identified to protect and enhance landscape qualities and promote their enjoyment. For each of the SLAs, THC has produced citations; contained within the Assessment of Highland Special Landscape Areas which set out the key landscape and visual characteristics, special qualities, sensitivity to change and potential for landscape enhancement and other interests.
- 6.78 It should be noted that the term 'Local Landscape Area' (LLA) follows Scottish Government policy and is the name for local landscape designations in Scotland. Some local authority policy and guidance documents may still refer to previous names such as 'Special Landscape Area', which is the term used in existing Highland Council policy documents. For the avoidance of doubt, the term 'Local Landscape Area' (LLA) has been used in this chapter.

³⁸ NatureScot (2010) Assynt - Coigach NSA. Available at: <https://sitelink.nature.scot/site/9119>

6.79 There are 7 no. LLA within the 45km study area. As illustrated by **Figure 6.10**, only Ben Klibreck and Loch Choire LLA are located within the 20km detailed study area, as illustrated by **Figure 6.11**. LLAs within the 45km study area include:

- Ben Klibreck and Loch Choire LLA, approximately 9.5km to the east-northeast.
- Bens Giam and Loch nan Clar LLA, approximately 28km to the north-east.
- Eriboll East and Whiten Head LLA, approximately 28km to the north.
- Fannichs, Beinn Dearg and Glencalvie LLA, approximately 28km to the south-southwest.
- Loch Fleet, Loch Brora and Glen Loth LLA, approximately 36km to the south-east.
- Oldshoremore, Cape Wrath and Durness LLA, approximately 37km to the north-northwest.
- Farr Bay, Strathy and Portskerra LLA, approximately 45km to the north-east.

6.80 Effects on LLAs are considered within the preliminary assessment of LCTs and Designated Sites in **Appendix 6.3** to determine which have the potential to experience significant effects and require detailed assessment.

6.81 Of the LLAs located in the study area, the Ben Klibreck and Loch Choire LLA has been identified as requiring further analysis and assessment. The key landscape and visual characteristics of Ben Klibreck and Loch Choire LLA and an outline of its special qualities is listed below, with a detailed assessment of potential effects, set out in subsequent sections of this chapter.

Ben Klibreck and Loch Choire LLA

6.82 Ben Klibreck and Loch Choire LLA lies approximately 9.5km to the north-east of the Site. As set out in the Assessment of Highland Special Landscape Areas, the key landscape and visual characteristics of Ben Klibreck and Loch Choire LLA are as follows:

- *"A very large-scale, open and exposed landscape in which a prominent, high isolated mountains rise conspicuously from the surrounding moorland with its very distinctive profile. The contrasting lower, hill massif is characterised by less distinctive landforms. Exceptional panoramic views are available from the high ridges and summits in clear conditions. Remote lochs occupy the trough between the mountains.*
- *At a broad level the landform is very simple. However at a more detailed level there is a diversity of upland habitats characterised by mosaics of heathland and grassland, with frequent rocky outcrops, screes and crags. Fragments of broadleaf woodland also occur on the lower ground that provides shelter.*
- *Pockets of gently sloping improved pasture fringe the shores of the two main lochs scattered with mature trees and stone sheepfolds. Occasional coniferous plantations appear particularly incongruous, contrasting in shape, colour and texture. This incongruity is particularly prominent when viewing from the isolated hill tops and distracts from the open panoramas seen from these areas.*
- *The isolated mountains, the lowland enclosed between them, the open moorland, and the extremely sparse settlement all contribute to a very strong sense of wildness within this area."*

6.83 The headline special qualities of Ben Klibreck and Loch Choire LLA are listed as follows:

- Distinctive mountains.
- Secluded Glen with Network of Tracks.
- Extensive Views from Peaks and Summits.
- Historic Landscape.

World Heritage Sites

6.84 It is noted that the Site is located within the Flow Country World Heritage Site (WHS), which has been awarded designation by the United Nations Educational, Scientific and Cultural Organisation (UNESCO).

6.85 The Flow Country, which relates to an extensive area of blanket bog, sheltered straths, moorland, and mountains encompasses much of Caithness and Sutherland. Whilst the Flow Country influences the landscape baseline, and therefore the assessment of potential effects, the WHS is not a landscape protection designation, nor does it have any statutory status in this regard.

6.86 Where relevant, potential effects are considered further within **Chapter 8: Ecology**.

Gardens and Designed Landscapes

6.87 As shown on **Figure 6.11**, there are no Gardens and Designed Landscapes (GDL) within 20km of the Site. Between 20km and 45km there are a number of GDLs, which are illustrated on **Figure 6.10**. GDLs within the 45km study area include:

- Tongue House GDL, approximately 35km to the north-east.
- Skibo Castle GDL, approximately 40km to the south-east.
- Dunrobin Castle GDL, approximately 42km to the south-east.
- Leckmelm GDL, approximately 42km to the south-west.

6.88 Given the distance from the proposed development and the very limited theoretical visibility from the GDLs, there is considered to be no potential for significant effects from the proposed development to arise. As a result, effects on GDLs in the study area are not considered further within the assessment.

Wild Land

6.89 Wild Land Areas (WLAs) are mapped and described by NatureScot³⁹.

6.90 As shown on **Figures 6.10 and 6.11**, the Site is close to a number of wild land areas, including:

- WLA 37. Foinaven - Ben Hee, which lies adjacent to the northern site boundary.
- WLA 34. Reay – Cassley, approximately 1km west to the west.
- WLA 35. Ben Klibreck – Armine Forest, approximately 8km east.

³⁹ NatureScot (2022) Landscape Sensitivity Assessment Guidance (Methodology). Available at: <https://www.nature.scot/doc/landscape-sensitivity-assessment-guidance-methodology>

- 6.91 The matter of wind energy and Wild Land is addressed in Policy 4, 'g' of the National Planning Framework 4 which states that:

'Buffer zones around wild land will not be applied, and effects of development outwith wild land areas will not be a significant consideration'.

- 6.92 As the Site does not lie within the extents of a WLA, effects on WLA's are not considered further within the assessment.

Published Landscape Character Descriptions

- 6.93 A review was undertaken of the following published sources of information regarding regional and local landscape character, landscape value, and landscape sensitivity:

- NatureScot National Landscape Character Assessment⁴⁰.
- Highland Council OWESG.

- 6.94 NatureScot guidance⁴¹ advises that any topic-specific landscape sensitivity studies would take precedence over the National Landscape Character Types. The study area is not covered by such a sensitivity study. Therefore, NatureScot's 2019 national landscape character assessment (LCA) has been used as the basis for the assessment of effects on landscape character.

- 6.95 At this point, for clarity, it is necessary to distinguish between two terms that are frequently used in published guidance and this chapter. They originate from the Guidelines for Landscape Character Assessment⁴²:

- Landscape Character Types (LCTs) are defined as tracts of landscape, which have a generic unity of character due to the particular combinations of landform, land cover, pattern and elements. The same landscape character type can occur at several different locations throughout a study area.
- Landscape Character Areas (LCAs) are defined as discrete geographical areas of a particular landscape character type and can only occur at a single location.

Landscape Character Types Covering the Site

- 6.96 With reference to **Figures 6.13 and 6.14**, the proposed turbines and the majority of the wind farm access tracks and associated infrastructure are located within LCT 134: Sweeping Moorland and Flows – Caithness & Sutherland, as defined by NatureScot.
- 6.97 This LCT occurs in other parts of the detailed 20km LVIA study area and as such has been subdivided into different units for the purposes of the assessment as follows: LCT 134:

⁴⁰ NatureScot (2019) National Landscape Character Assessment. Available at: <https://www.arcgis.com/apps/webappviewer/index.html?id=e3b4fbb9fc504cc4abd04e1ebc891d4e&extent=-2030551.0017%2C6851563.2052%2C1100309.6769%2C8923312.4198%2C102100>

⁴¹ NatureScot (2023) Landscape Character Assessment in Scotland. Available at: <https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/landscape-character-assessment-scotland>

⁴² The Countryside Agency and Scottish Natural Heritage (2002) Landscape Character Assessment. Guidance For England and Scotland

Sweeping Moorland and Flows – ‘Strath Fiag/Tirry’ unit covering the Site and land to the south-east only (the host unit where the proposed development would be located).

6.98 The key characteristics of LCT 134: Sweeping Moorland and Flows – Caithness & Sutherland are described by NatureScot as:

- “Gently sloping or undulating landform which lies generally below 350 metres.
- Occasional isolated hills of limited height form local landmark features.
- Lochs and mature, meandering rivers.
- Very distinct flora, dominated by sphagnum mosses, produced by the wetness and infertility of the flows.
- Areas of peat cuttings and haggings.
- Pockets of improved grazing, mainly within the outer fringes of sweeping moorland.
- Coniferous forest forming a dominant characteristic within some parts of this landscape character type.
- Ribbons of broadleaf woodland occasionally run along the water courses and loch edges.
- Very sparsely settled with dispersed crofts, farms and estate buildings largely found on the outer edges of this landscape or near a strath.
- Vehicular tracks within parts of the landscape.
- Wind farms, transmission lines, the A9 and a network of minor roads are key features within the more modified outer fringes within Caithness.
- Long, low and largely uninterrupted skylines offering extensive views across this landscape and result in a feeling of huge space.
- Consistent views to the distant Lone Mountains and Rugged Mountain Massif – Caithness & Sutherland.
- Great sense of exposure on areas of flat peatland on upland plateau.
- A strong sense of remoteness is associated within the largely uninhabited, inaccessible core flows and moorlands of this landscape.”

6.99 In terms of perception, the following description has been provided by NatureScot:

“The landscape has a strong sense of naturalness and remoteness, particularly at its core away from more settled and modified outer fringes. Their distinctly natural character is heightened by a rich diversity of birds, including plover and curlew, whose evocative calls contribute to the perception of wildness.

The Sweeping Moorland and Flows forms the setting to the Lone Mountains, the distinctive form and prominence of these mountains being accentuated by the simple, open and expansive nature of the low-lying moorland which surrounds them. Some areas of flat peatland occur on areas of upland plateau, for example, Knockfin Heights and also on the top of cliffs along the north coast of Caithness. The elevation of these areas and their surrounding space creates an even great sense of exposure, particularly upon the edges of the landform, where distant views across land and sea are afforded.

Views are long with uninterrupted largely uninterrupted skylines. Rapidly changing light and weather conditions are reflected in the smooth vegetation cover and loch systems. The Sweeping Moorland and Flows are important in providing a simple foreground to views of distant Lone Mountains and Rugged Mountain Massif – Caithness & Sutherland,

complementing the distinctive form of these mountains and accentuating their height and prominence. Views from the A9 between Latheron and Spittal, the B871, A836 and from the A838 across the low-lying moorland of A'Mhoine to the distant mountains are particularly dramatic."

- 6.100 As noted in the above key characteristics, wind energy development is an established component of the baseline landscape character.
- 6.101 It is important to acknowledge that landscape and visual effects arising from a proposed wind farm are one factor weighed in the overall planning balance, set against the current renewable energy and planning policy context applicable at the time.

Other Landscape Character Types to be assessed

- 6.102 In order to consider the indirect effects of the proposed development on landscape character, LCTs within 45km of the proposed development have been illustrated on **Figure 6.13**, with those located within the detailed 20km LVIA study area illustrated on **Figure 6.14**. The LCTs within 20km have also been overlaid with the blade tip ZTV on **Figure 6.15**.
- 6.103 An initial filtering exercise has been undertaken to determine which LCTs would have the potential for significant effects to arise and would therefore require detailed consideration in this chapter. The intention has been to ensure that the level of attention given to each LCT is proportionate to the likelihood of significant effects arising. The discussion below summarises the process followed in deciding which LCTs have the potential to experience significant effects as well as those LCTs that do not require any further consideration.
- 6.104 With reference to **Figures 6.13 – 6.15**, all LCTs located between 20km and 45km have been scoped out of further assessment, on account of the distance from the proposed development, the influence of other closer wind farm development and the relatively limited theoretical visibility. It is acknowledged that there may be potential for effects on the character of these LCTs but there would be no potential for significant effects to arise.
- 6.105 All LCTs present within the detailed 20km LVIA study area have been subject to an initial sieving exercise. The findings of this exercise are presented at **Table 6.3.1 of Technical Appendix 6.3: Preliminary Assessment of Landscape Character Types and Designations**.
- 6.106 The other LCTs assessed in detail in this chapter are:
- LCT 135: Rounded Hills Caithness & Sutherland – including 'Loch Shin Rounded Hills' unit adjacent to the Site to the south-west and 'Loch Fiag Rounded Hills' unit approximately 1km to the north.
 - LCT 138: Lone Mountains – located approximately 9.5km to the north-east.
 - LCT 139: Rugged Mountain Massif – Caithness & Sutherland – located approximately 5km to the north-west.
 - LCT 142: Strath – Caithness & Sutherland – 'Strath Tirry' unit located approximately 11km to the south-east only.

Local Landscape Description and Character Appraisal

- 6.107 A plan illustrating the landscape features/ elements within the Site and its immediate context (within a 5km radius of the proposed turbines) is presented on **Figure 6.17**. The following discussion provides an overview of the physical and perceptual characteristics of the Site and the immediately surrounding landscape without particular reference to published landscape character types.

Topography

- 6.108 Topography within 20km of the proposed development is illustrated on **Figure 6.16**.
- 6.109 The topography of the Site and its immediate context is broadly characterised as flat, gently undulating, low-lying moorland that rises to form occasional isolated hills.
- 6.110 Within the Site itself, the topography is undulating, with the lowest points being located along the roadside of the A838 as it routes past Loch Shin. Land here extends to approximately 100m - 105m AOD. Land along the eastern boundary routes through Glen Fiag; following the course of the River Fiag as it flows into Loch Shin. The remainder of the Site broadly ascends to the peak of Meall Odhar (285m AOD), which is located near the north-western corner of the Site.
- 6.111 Beyond the Site, topography forms part of the wider chain of rolling moorland rounded hills, that gently give way to rugged lone mountains and mountain massifs.

Watercourses and Drainage

- 6.112 A number of unnamed watercourses run in a generally easterly direction across the Site, draining into the River Fiag. The River Fiag drains into Loch Shin which lies approximately 1.2km from the Site boundary.
- 6.113 In the wider surrounding landscape, a number of small tributaries also flow towards the River Fiag, which courses past the eastern extents of the Site; with further rivers, burns, and tributaries also draining surface water from the surrounding mountain landscapes into lochs.

Vegetation

- 6.114 The Site incorporates moorland and actively managed commercial coniferous forestry associated with the Fiag Plantation.
- 6.115 Scattered riparian vegetation, incorporating trees and scrub are present across the Site, along the course of unnamed watercourses and the River Fiag.
- 6.116 The Site is located immediately between further commercial coniferous forestry plantations and in proximity of the extensive Dalchork Wood, which is located beyond Strath Tirry to the east-southeast.
- 6.117 Further information on the habitats within the Site can be found in **Chapter 8: Ecology** and the relevant technical appendices.
- 6.118 Within the wider study area, there are further extensive coniferous forestry plantations and broadleaved woodlands. Riparian vegetation appears along watercourses, whilst occasional shelterbelts and small farm woodlands are present amongst across the

landscape, often in the proximity of scattered residential properties or dispersed communities.

Built Infrastructure

- 6.119 The majority of the Site does not feature any built infrastructure, except for existing forestry access tracks.
- 6.120 To the immediate east of the Site, an access track from the A838 facilitates access to Fiag Lodge on the loch shore of Loch Shin.
- 6.121 Within the wider landscape, there are numerous individual farmsteads and small groups of properties, villages, and occasional small towns, situated mainly within the more settled valley landscapes, with some properties located at slightly higher elevations along the main routes that pass through the area.
- 6.122 Within the detailed 20km LVIA study area, there are a limited number of main transport routes that include: the A838, which passes the southern and western extents of the Site; and the A836 that passes through the eastern portion of the study area over 5km from the nearest proposed turbine. The Far North Line is a mainline railway line that stops at Lairg Railway Station over 20km from the Site.
- 6.123 In addition to the primary routes, a limited number of B-class roads and minor roads also pass through the 20km study area. These include the B873 which passes Loch Naver over 15km to the north-east, and the B869 that is partly used to form the North Coast 500 Route over 20km to the northwest.
- 6.124 There are also several operational wind farms which lie within 20km of the Site. These include the Creag Riabhach, Rosehall, and Achany developments. Other wind farms within 45km are illustrated on **Figure 6.29**.

Sensory and Perceptual Characteristics

- 6.125 The peak of Meall Odhar and the onsite commercial coniferous forestry, form notable landscape features when seen in many views from the immediately surrounding landscapes.
- 6.126 Forestry largely restricts views from the Site, with only those limited elevated pockets of land around Meall Odhar allowing for broad sweeping views in all directions. Views from here extend across the surrounding low-lying moorland towards the surrounding rugged lone mountains and mountain massifs, which provide the dramatic visual backdrop in views.
- 6.127 Within 10km of the Site, lies further commercial coniferous forestry plantations, the A838, the A836, scattered residential properties, dispersed property clusters, and the operational Creag Riabhach turbines. A smaller individual turbine is present at the former Overscaig Hotel. The Site is further influenced by views of electricity pylons and poles carrying overhead lines.
- 6.128 Whilst aspects of the Site exhibit some perception of remoteness and tranquillity, it is strongly influenced by its proximity to these other moderating influences that evidence human influence on the landscape.

Forces for Future Change in the Landscape

- 6.129 If the Site were not to be developed to accommodate the proposed development, the land would largely remain in its present condition over the short-term.
- 6.130 Over the medium and longer term, the main foreseeable forces for change in the landscape onsite, and immediately surrounding the Site, relate to changes to the coniferous forestry plantations, with areas of felling and replanting in line with forest management plans. Further changes may also occur due to changes in traditional forms of moorland management, which may change over time, such as by introducing longer rotations between burning, or changes to vegetation resulting from re-wetting or rewilding to encourage greater habitat diversity.
- 6.131 Within the wider landscape, there are several commercial wind energy developments and several consented developments which, if built, would also influence the existing nature of the wider landscape surrounding the proposed development as set out in the Cumulative Assessment (see **Assessment of Cumulative Effects**). In relation to operational wind energy developments, it is recognised that some may be subject to applications for repowering, but that decommissioning would be the default.
- 6.132 In addition to the consented or proposed developments within the vicinity of the Site, it is widely recognised that climate change will have an impact on the future character of the Scottish landscape through changes to weather conditions that will in turn result in changes to vegetation that will affect the intrinsic character of the landscape.
- 6.133 Other pressures that may cause change in the baseline landscape and visual context in the future may include built development along infrastructure corridors and trunk roads, and potential settlement expansion at existing villages and towns.

Visual Receptors

- 6.134 With reference to the blade tip ZTVs at **Figure 6.3** and **6.4**, theoretical visibility extends approximately 9km to the north before higher landform near Ben Hee restricts visibility. Theoretical visibility extends approximately 10km to the north-west, where higher landform to the west of the A838 restricts visibility; however, some theoretical visibility is possible to distances up to approximately 13km from higher land, including from Ben More Assynt to the north-west and Beinn Leoid to the west. Theoretical visibility extends approximately 7km to the south-west, limited by rising land south-west of Loch Shin and up to approximately 10km to the south, where higher land including Ben Sgeireach restricts visibility.
- 6.135 To the south-east, theoretical visibility extends along Loch Shin and towards Lairg, up to distances of approximately 23km. There is notably no theoretical visibility along Strath Tirry between the A838 and A836. Theoretical visibility extends up to approximately 14km to the west, restricted by higher land including Ben Klibreck and the smaller peaks of Meall Meadhonach and Creag Riabhach na Greighe. To the north-east, theoretical visibility extends up to approximately 9km, limited by higher land, including the peaks of Meall an Fhuarain, Creag Riabhach, and Meall an Amaidich.
- 6.136 Some sporadic theoretical visibility is possible from areas of higher ground within the wider 45km study area, which include the peaks of Ben Hope and Ben Loyal to the north and north-east, as well as from Carn a Choin Deirg to the south.
- 6.137 It was determined that there was no potential for the proposed development to result in any significant visual effects at distances over 20km from the Site as with increased

distance from the Site, the likelihood of significant visual effects occurring incrementally decreases. Therefore, whilst the initial study area for this LVIA extends out to 45km and the various figures which accompany this chapter illustrate an initial 45km study area (as agreed with the statutory consultees at scoping), the assessment has focused on visual receptors within a detailed 20km LVIA study area.

- 6.138 Interpretation of the ZTVs (**Figures 6.3 – 6.8** and the ZTV quadrants at **Figures 6.21 – 6.28**) assisted in identifying potentially sensitive visual receptors. Principal visual receptors within the surrounding landscape are illustrated on **Figures 6.18** and **6.19** and are identified below.
- 6.139 As set out within **Technical Appendix 6.4**, an initial filtering exercise has been undertaken to identify which visual receptors have the potential to be significantly affected by the proposed development. In conclusion, the following visual receptors will be considered further within the LVIA:

Residential Receptors and Settlements

- Aultnacoarach – located approximately 4.7km to the south-east.
- Shinness – located approximately 8.75km to the south-east.
- Achnairn – located approximately 12.25km to the south-east.
- Tirryside – located approximately 14.5km to the south-east.
- Lairg – located approximately 18.5km to the south-east.

Recreational Receptors

- Core Path SU16.03 Ord Hill – located approximately 19km to the south-east.
- Core Path SU16.10 Loch Craggie – located approximately 18.75km to the south-east.
- Core Path SU16.05 Loch Shin Hide – located approximately 15.75km to the south-east.
- John O'Groats Cycle Route – located approximately 6km to the east at its closest point.

Road receptors

- A838 – located approximately 850m to the south at its closest point.
- A836 – located approximately 6km to the east at its closest point.
- A839 – located approximately 19km to the south-east at its closest point; and
- Moray Firth Tourist Route – located approximately 19km to the south-east at its closest point.

- 6.140 In addition to the above, seven residential properties are considered within the accompanying Residential Visual Amenity Assessment (RVAA) which is set out in **Technical Appendix 6.6**.

Assessment Viewpoints

- 6.141 The following table sets out the viewpoints considered as part of this assessment. These viewpoints have been derived through desk-based analysis, site visits, interpretation of ZTVs, and through consideration of the viewpoints used in the assessment of other nearby wind farms. The assessment viewpoints have also been consulted on as part of the EIA scoping process and amended following feedback received, as set out in **Table 6.1** above.
- 6.142 The viewpoints are representative of a range of views towards the proposed development. They are not intended to cover every single view but are representative of a range of distances from the Site and receptor types (e.g. residents, walkers, road users). They have been used to inform the assessment of effects on landscape character, the visual assessment, the cumulative assessment, and the assessment of visual receptor groups.
- 6.143 **Table 6.4: Assessment Viewpoints** below identifies the 20no. agreed assessment viewpoints. The locations of these viewpoints are illustrated on multiple LVIA figures.

Table 6.4: Assessment Viewpoints

Viewpoint	OS Grid Reference	Approximate Distance to Nearest Turbine	Receptor Type
1: A838 near Fiag Bridge (N)	E246776, N920438	1089m (T15)	Road users
2: Loch Fiag	E245506, N927664	2360m (T1)	Recreational
3: A838 near Overscaig Hotel (N)	E241749, N923235	3219m (T5)	Residential and road users
4: A838 near Sithean Dubh Mor	E250282, N918703	4737m (T15)	Road users
5: A836 near Crask Inn	E252383, N924718	6367m (T13)	Road users
6: Maovally	E237829, N921196	7670m (T5)	Recreational
7: Ben Hee	E242655, N933918	8666m (T1)	Recreational
8: Ariscaig	E250911, N914167	8566m (T15)	Residential and Recreational

9: A838 near West Shinness Lodge	E252804, N915452	8762m (T15)	Residential and road users
10: Ben Sgeireach	E245352, N911826	9709m (T15)	Recreational
11: A836 Rhian Bridge	E256313, N916632	10997m (T15)	Road users
12: Ben More Assynt	E231838, N920055	13698m (T5)	Recreational
13: Ben Klibreck (Meall nan Con)	E258515, N929883	14078m (T2)	Recreational
14: A836 near An t-Sron (N)	E256986, N908513	16710m (T15)	Road users
15: The Ord	E257327, N905602	19247m (T15)	Recreational
16: Torroble* (N)	E259231, N904250	21454m (T15)	Residential and road users
A: Beinn Leoid*	E232050, N929470	13187m (T1)	Recreational
B: Ben Hope*	E247740, N950150	24869m (T1)	Recreational
C: Ben Loyal*	E257623, N948252	26153m (T2)	Recreational
D: Càrn a' Choin Deirg*	E239742, N892386	29848m (T15)	Recreational

* Additional LVIA Viewpoint added following feedback received at scoping.

(N) Night-time visualisation produced from this viewpoint in addition to day-time visualisation.

6.145 **Technical Appendix 6.5: Viewpoint Assessment** provides a baseline description of the view from each assessment viewpoint, followed by a detailed analysis and assessment of the effects.

Assessment of Potential Effects

- 6.146 Following a brief summary of the proposed development, this section of the LVIA considers the effects of the proposed development on the physical features of the Site (landscape fabric), landscape character, and visual amenity. It considers the effects during the construction and operational phases of the proposed development.
- 6.147 Effects during the construction phase are considered to be temporary and would have a short duration. Effects associated with the operational phase of the proposed development are considered to be long-term, reversible effects.

Proposed Development

- 6.148 A detailed description of the proposed development is set out in **Chapter 3: Project Description**. The description below summarises those details of the proposed development that have particular relevance to this LVIA.
- 6.149 The proposed development would comprise the following visible features which may have an impact on landscape character or visual amenity:
- 15 wind turbines of up to 250m to tip height (hub height 169m, rotor diameter 162m is used for modelling). The proposed turbines would be three-bladed horizontal axis machines; the finish and colour of the turbines would be semi-matt and pale grey in colour).
 - Visible, medium intensity (minimum 2000 candela (cd)/ 200cd at horizontal and slightly above) steady red aviation warning lights on the nacelles of six of the 15no. proposed turbines. There would be no intermediate tower lights.
 - Associated turbine compound areas including foundations and crane hardstanding areas adjacent to each turbine.
 - New on-site access tracks, and upgrade of 4.93km of existing forestry tracks.
 - An on-site 132kV substation.
 - Substation, and on-site underground cables linking the turbines to the substation.
 - Energy storage compound.
 - Two new watercourse crossings and eight upgraded watercourses, as set out in EIA Report Volume 4, Technical Appendix 10.1.
 - Up to three borrow pit search areas.
 - Temporary construction and storage compounds and ancillary infrastructure.
- 6.150 The proposed development would have construction, operation, and decommissioning phases, with an operational lifetime of 35 years.

Forestry

- 6.151 The proposed development is situated within an active commercial coniferous forestry plantation, dominated by a mixture of sitka spruce and lodgepole pine.
- 6.152 As a result of the proposed development, areas of the commercial coniferous forestry plantation would require to be felled to better accommodate the proposed turbines, including the infrastructure footprint, access tracks, turbine hardstanding areas, the 132kV substation and the battery storage compound.

- 6.153 In addition, large areas of the commercial coniferous forestry plantation, whilst retained during the initial phases of the proposed development, would require to be felled during the operational phase of the proposed development for forestry management purposes. These areas would however be replanted with mainly mixed conifer tree species. The extent of retained and replanted forestry within the Site is shown on **Figure 14.3: With Wind Farm Replanting Plan**. Any areas subject to felling to accommodate the proposed development during the construction phase would be “open” for approximately two years until the new forestry is planted which would mature up to 2m in height over seven years.
- 6.154 Consideration has been given in the assessment to the management of forestry plantations on-site, and in the immediate surrounds. Beyond the confines of the Site, and when considering the information on ancient/ native woodlands provided in Scottish Forestry’s digital map (available to view online here: [Scottish Forestry Map Viewer](#)), there is an expectation that regular felling and replanting practices may influence how the Site and surrounds are experienced during various periods of time.
- 6.155 Whilst it is recognised that the felling cycles of coniferous forestry compartments in-and-surrounding the Site would alter the heights of different areas of forestry over time (potentially altering localised visual effects as a by-product), the assessment results are predicted to remain fairly consistent over the lifetime of the proposed development as the pattern of forestry would remain relatively constant.
- 6.156 When considering future felling/ replanting operations on the Site specifically, it is important to recognise that the Applicant would have control of the coniferous forestry compartments. Further detail in relation to the proposed felling operations can be found in **Chapter 14: Forestry**.
- 6.157 So, whilst the assessments presented in this LVIA are largely based on current baseline conditions, it is acknowledged that future felling/ replanting operations on the Site, or in the immediate surrounds, may have a sufficient influence from certain locations and views. As a result, and to further understand localised effects, and the level of effect across the wider landscape, additional assessments pertaining to forestry felling have been included for each of the agreed viewpoints (see **Technical Appendix 6.5**) and from the properties in the RVAA study area (see **Technical Appendix 6.6**).
- 6.158 To support these assessments, visualisations illustrating the potential effects of the felling procedures across the initial nine-year period – as shown on **Figure 14.3** – have been prepared from the following viewpoints which all lie within 5km of the nearest proposed turbine: **Viewpoint 1: A838 near Fiag Bridge, Viewpoint 2: Loch Fiag, and Viewpoint 4: A838 near Sithean Dubh Mor** (see **Volumes 3 and 5**). Whilst **Viewpoint 3: A838 near Overscaig Hotel** also lies within 5km of the Site, a visualisation showing the potential effects of forestry planting has been excluded on the basis that there is limited prospect to view the on-site forestry owing to intervening landform and coniferous forestry outwith the control of the Applicant.

Effects during Construction on Existing Landscape Features

- 6.159 As identified in the baseline section, the existing landscape features present on the Site are:
- Commercial coniferous forestry plantation.
 - Moorland vegetation; and
 - Watercourse/ drainage channels.

- 6.160 The construction phase would result in the removal of commercial coniferous forestry plantation, through the construction of on-site access tracks, hardstanding areas, a substation and battery storage compound, on-site underground cabling, temporary borrow pit workings, construction compounds, and turbine foundations. Connecting underground electricity cables would generally follow access tracks.
- 6.161 The existing commercial coniferous forestry plantation would be removed to allow construction of foundations for the various elements. Soils stripped as part of the establishment works would be stored in accordance with established soil handling best-practice for use during reinstatement works on completion of construction activities. Areas of moorland to the north-west of the Site would not be disturbed.
- 6.162 According to **Chapter 3: Project Description**, up to three borrow pit search areas would be required. The final location, number, and estimate of material won from each search area would be determined once full ground investigation works, and testing has been completed. All of the borrow pits would be located within LCT 134: Sweeping Moorland and Flows. Their excavation would be short-term and would result in the removal of trees, vegetation, soils and subsurface rock. Borrow pit workings would be restored following construction to encourage replanting of commercial forestry; although, it is accepted that some regrading of the land profile would be expected.
- 6.163 Commercial coniferous forestry plantation is commonly found within the locality and within the surrounding landscape. It does not form part of the fabric of a site designated for its scenic value, and it is generally deemed as a feature with relatively limited landscape value. The proposed felling and replanting resulting from ongoing management practices, lowers its susceptibility. Combining its value and susceptibility results in the sensitivity of the on-site commercial coniferous forestry plantation being low.
- 6.164 The commercial coniferous forestry plantation would experience a medium to high magnitude of change resulting from the removal of forestry to accommodate the construction of new access tracks, laydown areas, crane pads, and turbine foundations, which would affect most of the overall plantation contained within the Site boundary extents. Some areas of forestry would be retained during the construction phase, particularly to the south close to the A838 and to the north and east. The overall level of effect on the commercial coniferous forestry plantation found on Site as a result of the proposed development is predicted to be **moderate/ minor**, which is not considered to be significant.
- 6.165 Areas of moorland to the north-west would remain unaffected by the proposed development.
- 6.166 A number of watercourse crossings would be required as part of the proposed development, with existing crossing points utilised wherever possible. These features are considered to be of low value in landscape terms but highly susceptible to changes which affect their course or their quality. Combining their value and susceptibility results in the watercourse and drainage features found on Site as having a medium level of sensitivity.
- 6.167 The proposed turbines and associated infrastructure have been located away from any watercourses/ channels on the Site. It is therefore only in the location of the proposed watercourse crossings where there is potential for construction effects to occur. The River Fiag to the east of the Site would remain unaffected by the proposed development.
- 6.168 As effects would be limited and controlled through best-practice construction and environmental practices, the predicted change would result in no greater than a low

magnitude change. As a result, effects are judged as being **moderate/ minor**, which is not considered to be significant.

Summary of Effects during Construction on Existing Landscape Features

- 6.169 The proposed development would result in a **moderate/ minor** effect to the commercial coniferous forestry plantation found on Site. No effects are predicted upon moorland vegetation and there is judged to be no greater than a **moderate/ minor** effect to watercourses and drainage channels. These effects are all considered to be not significant.

Operational Effects on Existing Landscape Features

- 6.170 Most areas of removed commercial coniferous forestry plantation would be replanted following the construction phase. Whilst the replanting of similar coniferous species is unlikely to bring about beneficial changes to landscape character, it has the potential to result in long-term benefits in way of providing visual enclosure of access tracks, the substation, and the battery storage compound.

Assessment of Effects on Landscape Character

- 6.171 The LCTs covering the initial 45km LVIA study area are shown on **Figure 6.13**, and within the detailed 20km LVIA study Area at **Figure 6.14**. LCTs within 20km of the proposed development overlaid with the blade tip ZTV are illustrated at **Figure 6.15**.
- 6.172 As explained in **Technical Appendix 6.3** and as set out in the baseline section, an initial filtering process has been carried out on all LCTs within the detailed 20km LVIA study area which identified that, in addition to the LCT in which the proposed development is located, a further four LCTs have the potential to be significantly affected by the proposed development. The LCTs assessed in detail in this assessment are:
- LCT 134: Sweeping Moorland and Flows – ‘*Strath Fiag/Tirry*’ unit covering the Site and land to the south-east only.
 - LCT 135: Rounded Hills Caithness & Sutherland – including ‘*Loch Shin Rounded Hills*’ unit adjacent to the Site to the south-west and ‘*Loch Fiag Rounded Hills*’ approximately 1km to the north.
 - LCT 138: Lone Mountains – located approximately 9.5km to the north-east.
 - LCT 139: Rugged Mountain Massif – Caithness & Sutherland – located approximately 5km to the north-west; and
 - LCT 142: Strath – Caithness & Sutherland – ‘*Strath Tirry*’ unit located approximately 11km to the south-east only.

Sensitivity of Landscape Character to Wind Energy Development

- 6.173 The first stage in assessing the effects of the proposed development on landscape character is to evaluate the sensitivity of the LCTs brought forward into detailed assessment, to the type of change proposed. As indicated within GLVIA3, sensitivity of landscape character should be determined through a consideration of both susceptibility to change and any values associated with the landscape.

LCT 134: Sweeping Moorland and Flows (Strath Fiag/Tirry unit)

- 6.174 This LCT unit is covered by the Site and extends approximately 5km to the west, 10km to the east, and beyond 20km to the south-east. The unit features some large areas of coniferous forestry plantation in various stages of maturity, including within the Site, areas to the west along Loch Shin, and areas east of Strath Tirry. The LCT unit does however feature undulating areas of moorland predominately between Loch Shin/ A838 and the A836. The LCT unit features scattered properties and small settlements as well as overhead powerlines with associated pylons.
- 6.175 There are no landscape designations over most of the LCT unit; however, northern parts of the LCT unit are covered by the 37. Foinaven – Ben Hee WLA. The Ben Klibreck and Loch Choire LLA covers a very limited part of the unit to the north-east. On balance, the LCT unit is assessed as having a medium value.
- 6.176 Northern parts of the LCT unit are more remote and feature open areas of moorland. Due to the influence of coniferous forestry plantation and A-class roads crossing the LCT unit, it is assessed as having a medium susceptibility to the change proposed.
- 6.177 Combining the LCT unit's value and susceptibility results in a medium sensitivity to the change proposed.

LCT 135: Rounded Hills Caithness & Sutherland (Loch Shin Rounded Hills unit)

- 6.178 This LCT unit lies adjacent to the Site and extends to cover Loch Shin and the land to the north-west of Loch Shin. The land to the north-west of Loch Shin is mostly made up of open moorland featuring numerous rounded hills of differing steepness and height, interspersed by small lochs and watercourses. Areas of coniferous forestry plantation are relatively sparse, mostly located adjacent to Loch Shin. Development within the area is limited to scattered properties along Loch Shin, and near Rosehall and Achany wind farm. The pattern of the LCT unit continues beyond Glen Cassley and over 10km to the south-west of the Site.
- 6.179 Most of the LCT unit is covered by the 34. Reay – Cassley WLA, with the north-western boundary lying adjacent to the Assynt Coigach NSA. The LCT unit is assessed as having a high value.
- 6.180 The LCT unit is within an undulating, open, and remote landscape with limited influence of nearby development. With a sense of remoteness and wildness, the LCT unit is assessed as having a high susceptibility to the change proposed.
- 6.181 Combining the LCT unit's value and susceptibility results in a high sensitivity to the change proposed.

LCT 135: Rounded Hills Caithness & Sutherland (Loch Fiag Rounded Hills unit)

- 6.182 This LCT unit lies approximately 1km to the north at its closest point and extends up to 11km to the north and beyond 20km to the north-east. The area closest to the Site includes open steep sided hills surrounding Loch Fiag. The land further to the north-east is mostly made up of open moorland featuring numerous rounded hills of differing steepness and height, interspersed by small lochs and watercourses. Most of the Creag Riabhach wind farm is located within the LCT unit to the north-east, as well as coniferous forestry plantation following the A836.

- 6.183 Most of the LCT unit to the north of the Site is covered by the 37. Foinaven – Ben Hee WLA, with limited parts of the LCT unit to the north-east fringed by the 35. Ben Klibreck – Armine Forest WLA as well as the Ben Klibreck and Loch Choire LLA. The LCT unit is assessed as having a high value.
- 6.184 The LCT unit is within an undulating, open and remote landscape with limited influence of nearby development; however, partly influenced by nearby wind farm development. With a sense of remoteness and wildness, the LCT unit is assessed as having a medium to high susceptibility to the change proposed.
- 6.185 Combining the LCT unit's value and susceptibility results in a high sensitivity to the change proposed.

LCT 138: Lone Mountains

- 6.186 The LCT is made up of a series of steep hillsides, including the peaks of Creag an Lochain (808m AOD), Meall nan Con (961m AOD), Meall Ailean (724m AOD) and The Whip (566m AOD), located between Strath Vagastie and Loch Choire. The LCT does not feature any development within it.
- 6.187 All of the LCT is covered by the Ben Klibreck and Loch Choire LLA and the 35. Ben Klibreck – Armine Forest WLA. The LCT is assessed as having a high value.
- 6.188 The LCT is a remote upland landscape with a rugged nature that provides a strong sense of wildness and remoteness. Whilst influenced in-part by Creag Riabhach wind farm, the LCT is assessed as having a high susceptibility to the change proposed.
- 6.189 Combining the LCT's value and susceptibility results in a high sensitivity to the change proposed.

LCT 139: Rugged Mountain Massif – Caithness & Sutherland

- 6.190 The LCT is made of steep sided mountains set in between lochs, with the most notable peaks including Ben Hee (873m AOD) to the north, Beinn Leoid (792m AOD) to the north-west, and Ben More Assynt (998m AOD) to the west. The most notable development within the LCT is the A838 with occasional properties and coniferous forestry plantation aligning the route.
- 6.191 The LCT is covered by two WLAs, namely 34. Reay – Cassley WLA and 37. Foinaven – Ben Hee WLA. The LCT is also partly covered by the Assynt Coigach NSA. The LCT is assessed as having a high value.
- 6.192 The LCT is a remote upland landscape with a rugged nature that provides a strong sense of wildness and remoteness. The LCT is assessed as having a high susceptibility to the change proposed.
- 6.193 Combining the LCT's value and susceptibility results in a high sensitivity to the change proposed.

LCT 142: Strath – Caithness & Sutherland (Strath Tirry unit)

- 6.194 The LCT unit consists of lower lying gently undulating farmland and coniferous forestry plantation either side of the meandering River Tirry. The strath is settled and includes the small settlements of Achnairn and Tirryside, as well as being crossed by overhead powerlines with associated pylons close to Loch Shin and two A-class roads.

- 6.195 There are no landscape designations over the LCT unit, with the unit being influenced by the development within it. On balance, the LCT unit is assessed as having a medium to low value.
- 6.196 The LCT unit is influenced by the coniferous forestry plantation and the A-class roads crossing the area, as well as the settlement pattern including other minor roads connecting residential properties. It is assessed as having a medium susceptibility to the change proposed.
- 6.197 Combining the LCT's value and susceptibility results in a medium sensitivity to the change proposed.

Table 6.5: Landscape Character Sensitivity

Landscape Character Type (<i>unit</i>)	Value	Susceptibility	Sensitivity
LCT 134: Sweeping Moorland and Flows (<i>Strath Fiag/Tirry unit</i>)	Medium	Medium	Medium
LCT 135: Rounded Hills Caithness & Sutherland (<i>Loch Shin Rounded Hills unit</i>)	High	High	High
LCT 135: Rounded Hills Caithness & Sutherland (<i>Loch Fiag Rounded Hills unit</i>)	High	High/ medium	High
LCT 138: Lone Mountains	High	High	High
LCT 139: Rugged Mountain Massif – Caithness & Sutherland	High	High	High
LCT 142: Strath – Caithness & Sutherland (<i>Strath Tirry unit</i>)	Medium/ low	Medium	Medium

Effects on Landscape Character during Construction

- 6.198 The proposed turbines, substation, battery storage, access tracks and associated infrastructure would all be located within LCT 134: Sweeping Moorland and Flows (*Strath Fiag/Tirry unit*).
- 6.199 During the construction phase, there would be the temporary presence of cranes on the Site and the movement of other construction traffic, consistent with the formation of access tracks, hardstandings, turbine foundations, other associated infrastructure, and the installation of the turbines. Forestry within the coniferous plantation would also need to be removed to facilitate construction of the proposed development, with select areas then replanted, as shown on **Figure 14.3**. Whilst the timetable for certain forestry management activities would be impacted as a result of the proposed development, it is recognised that felling and replanting of trees is a regular occurrence at an active commercial forestry plantation, that would happen with/ without the proposed development. As a result, this

is considered to have less of a bearing on the magnitude of change and subsequent effect judgements presented below.

- 6.200 Effects during construction on landscape character would increase incrementally through the construction phase as more turbines, foundations, hardstandings, and ancillary elements are constructed. Construction activities would move from turbine location to turbine location and, as activities increased in one location, they would be decreasing at locations where construction activities had finished.
- 6.201 Cranes would be involved in the erection of the turbines, but these would be onsite for a relatively short period of time during the overall construction phase. The cranes would form noticeable vertical features in the landscape for a short period of time but would be a relatively diminutive visual component given their slender form compared with the turbines being erected.
- 6.202 There would be localised areas of high/ medium magnitude of change directly within the Site and up to 2km from the construction activity, within the LCT 134: Sweeping Moorland and Flows (*Strath Fiag/Tirry unit*) during the construction phase. This would result in a **moderate** temporary effect on part of the LCT unit where the proposed development is located, which would be significant. The effects upon the LCT unit would be less where limited by the surrounding coniferous forestry plantation to the north-east and south-west.
- 6.203 The additional effects upon LCT 134: Sweeping Moorland and Flows (*Strath Fiag/Tirry unit*) during the construction phase beyond 2km would reduce to a low magnitude of change, which would result in a **moderate/ minor** temporary I not-significant effect.
- 6.204 Due to the proximity of both LCT 135: Rounded Hills Caithness & Sutherland (*Loch Shin Rounded Hills unit*) to the south and LCT 135: Rounded Hills Caithness & Sutherland (*Loch Fiag Rounded Hills unit*), a no greater than medium magnitude of change would occur within 2km of the LCT units. This would result in **moderate** temporary effects on both LCT units, which would be not significant. Beyond 2km, a low magnitude of change is predicted for both LCT units, resulting in **moderate/ minor** temporary effects, which would be not significant.
- 6.205 Construction activity would likely be visible from LCT 138: Lone Mountains due to the elevated location in comparison to the Site. At a distance of over 10km, a low magnitude of change is predicted, which would result in a **moderate/ minor** temporary additional not-significant effect.
- 6.206 Due to the intervening landform and other areas of coniferous forestry plantation, the influence of construction activity from elevated areas of LCT 139: Rugged Mountain Massif – Caithness & Sutherland, is predicted to result in a very low magnitude of change, resulting in a **minor** additional not-significant effect.
- 6.207 Due to the distance of LCT 142: Strath – Caithness & Sutherland (*Strath Tirry unit*) from construction activity and the network of intervening landform and vegetation, a very low magnitude of change is predicted, resulting in a **minor** temporary not-significant effect.
- 6.208 A summary of the effects on landscape character during construction is presented in **Table 6.6: Assessment of Effects on Landscape Character during Construction**. Note that for all character types stated within this table, the duration of the proposed development is considered to be temporary.

Table 6.6: Assessment of Effects on Landscape Character during Construction

Landscape Character Type	Sensitivity	Magnitude of Change	Effect	Significant
LCT 134: Sweeping Moorland and Flows (<i>Strath Fiag/Tirry unit</i>)	Medium	High/ medium (including proposed development and up to 2km)	Moderate	Yes
		Low (beyond 2km)	Moderate/ minor	No
LCT 135: Rounded Hills Caithness & Sutherland (<i>Loch Shin Rounded Hills unit</i>)	High	Medium (within 2km)	Moderate	No
		Low (beyond 2km)	Moderate/ minor	No
LCT 135: Rounded Hills Caithness & Sutherland (<i>Loch Fiag Rounded Hills unit</i>)	High	Medium (within 2km)	Moderate	No
		Low (beyond 2km)	Moderate/ minor	No
LCT 138: Lone Mountains	High	Low	Moderate/ minor	No
LCT 139: Rugged Mountain Massif – Caithness & Sutherland	High	Very Low	Minor	No
LCT 142: Strath – Caithness & Sutherland (<i>Strath Tirry unit</i>)	Medium	Very Low	Minor	No

Bold text indicates a significant effect.

Effects on Landscape Character during Operation

6.209 The effects on landscape character during the operational phase of the proposed development are discussed below in relation to each of the LCTs brought forward into detailed assessment (refer to **Technical Appendix 6.3**). The magnitude of change on landscape character as a result of the proposed development has been determined using professional judgement based on the following factors:

- The percentage of the character type from where the Site would theoretically and actually be visible.
- The distance between the LCT and the Site.

- The likely prominence of the turbines from the LCT taking account of existing locally dominant characteristics in the landscape character type; and
- The degree to which the physical and perceptual characteristics of the landscape would change as a result of the proposed development.

6.210 To aid the consideration of the operational effects on landscape character, the LCTs within the detailed 20km LVIA study area have been overlaid with the blade tip ZTV in **Figure 6.15**.

6.211 Beyond the immediate environs of the Site, the ground level components of the proposed development would not be discernible from lower-lying areas due to the locally elevated landform upon which the proposed development would be located. Therefore, effects on landscape character, as experienced in the wider landscape, for most locations arise largely in relation to the introduction of the proposed turbines into the landscape and the resultant changes to the experience of landscape character.

6.212 It is acknowledged that there may be more elevated areas where ground-level elements may be visible, and these are considered within the assessment where relevant.

6.213 It is noted that in general, the magnitude of change in landscape character would incrementally decrease with distance from the proposed turbines as they become gradually less prominent.

6.214 A summary of the effects on landscape character during operation is presented in **Table 6.5: Assessment of Effects on Landscape Character during Operation**. Note that for all LCTs stated within this table, the duration of the proposed development is considered to be long-term and reversible.

LCT 134: Sweeping Moorland and Flows (Strath Fiag/Tirry unit)

6.215 The proposed development, including all 15no. proposed turbines, substation, battery storage and access tracks would be located within this LCT unit. Views from this LCT unit are broadly represented by Viewpoints 1, 3, 4, 5, and 9 (see **EIAR Volumes 3 and 5**). The proposed development is located to the north-west of this large LCT unit, with most of the LCT stretching alongside the north-eastern edges of Loch Shin and beyond.

6.216 With reference to **Figure 6.15**, which shows LCTs within 20km overlaid with the blade tip ZTV, there is extensive theoretical visibility of all proposed turbines across most of the LCT unit up to 20km from the Site. Actual visibility would however be reduced due to the coniferous forestry plantations within and near to the Site, as well as within the wider LCT unit.

6.217 Whilst the proposed turbines would represent a notable change to the immediate vicinity of the Site, their location within and close to large areas of coniferous forestry plantation, as well as their location on sloping ground within Glen Fiag, limits the landscape character effects to some degree. Despite the size and scale of the proposed turbines, referring to a representative viewpoint (Viewpoint 3), the intervening forestry and landform would reduce the influence of the proposed development upon landscape character. From locations of more open moorland, referring to the representative viewpoints (Viewpoint 1 and 4), however, and despite the context of overhead powerlines with associated pylons featuring within the landscape, the proposed development would become the single-most prominent characteristic feature.

6.218 The proposed development would introduce a high/ medium magnitude of change upon the LCT unit that would extend to approximately 4km to the north and approximately 5km

to the north-east, east, and south-east. Combined with the sensitivity of the LCT unit, this would result in a **moderate** and significant effect.

- 6.219 To the west of the proposed development, a combination of landform and coniferous forestry plantation would limit the influence upon the LCT unit. Therefore, the proposed development would introduce a medium/ low magnitude of change upon the LCT unit that would extend to approximately 4km to the west. Combined with the sensitivity of the LCT unit, this would result in a **moderate/ minor** and not-significant effect.
- 6.220 Between 5km to 8km to the north-east, east and south-east, the influence of the proposed development would reduce due to distance from the proposed turbines, with the proposed development also not influencing those areas covered by coniferous forestry plantation to the east. Referring to a representative viewpoint (Viewpoint 5), within areas of open rolling moorland, the proposed development would still have an influence upon the character of the LCT unit. Therefore, a medium magnitude of change would occur upon the LCT unit, which when combined with the sensitivity, would result in a **moderate** and significant effect.
- 6.221 Between 8km and 12km to the north-east, east, and south-east, large tracts of the LCT unit would not influence the landscape character due to the extents of coniferous forestry plantation. Areas of the LCT unit to the north-east would also be influenced by the proximity to Creag Riabhach wind farm. Therefore, the proposed development would introduce a medium/ low magnitude of change upon the LCT unit, which when combined with the sensitivity, would result in a **moderate/ minor** not-significant effect.
- 6.222 Beyond 12km to the south-east, despite the theoretical visibility within the LCT unit as shown on **Figure 6.15**, most of the area is covered by coniferous forestry, therefore, limiting the influence upon landscape character. The proposed development would introduce a very low magnitude of change upon the LCT unit, which when combined with the sensitivity, would result in a **minor** not-significant effect.

LCT 135: Rounded Hills Caithness & Sutherland (Loch Fiag Rounded Hills unit)

- 6.223 The LCT unit is located adjacent to the Site and approximately 1km to the south and south-west of the proposed turbines, therefore any effect discussed below would be indirect. Views from the LCT unit are represented by Viewpoints 6, 8, and 10 (see **EIAR Volumes 3 and 5**).
- 6.224 Referring to **Figure 6.15**, theoretical visibility is mostly concentrated within the northern part of the LCT within 10km of the proposed development, with the pattern of hills limiting influence upon areas further to the south-west and south. Theoretical visibility does however extend along the length of Loch Shin up to a distance of 18km. Apart from limited areas of coniferous forestry plantation along the edges of Loch Shin which would limit the influence of the proposed development in these areas, it is considered that the actual visibility aligns with that shown on **Figure 6.15**.
- 6.225 Due to the relative open and remote nature of the landscape to the south-west of Loch Shin, the proposed development would be a clearly noticeable feature within the landscape that would influence the physical and perceptual characteristics of the landscape within 5km of the proposed turbines to the south and south-west. The proposed development would introduce a high/ medium magnitude of change upon the LCT unit at this distance. Combined with the sensitivity of the LCT unit, this would result in a **major/ moderate** and significant effect.

- 6.226 Due to the undulating and open nature of the landscape, the proposed development would have the potential to influence those remote higher areas of the LCT unit, between 5km and 8km from the proposed turbines. When referring to a representative viewpoint (Viewpoint 6), which depicts the landscape character of the LCT unit, and whilst the Creag Riabhach wind farm and powerlines would be present on the opposing side of Loch Shin, the proposed development would influence the physical and perceptual characteristics of the landscape. The proposed development would introduce a medium magnitude of change upon the LCT unit at a distance between 5km to 8km, including to the west, south, and south-east of the Site. Combined with the sensitivity of the LCT unit, this would result in a **moderate** and significant effect.
- 6.227 Between 8km to 12km, visibility of the proposed development would be obscured by intervening rounded hills to the west and south-west. Vegetation along Loch Shin would serve to limit the influence of the proposed development upon the LCT unit to the south-east (refer to Viewpoint 8). The proposed development would influence the physical and perceptual characteristics of the landscape from higher locations (refer to Viewpoint 10). The proposed development would introduce a medium/ low magnitude of change upon the LCT unit at a distance between 8km to 12km, including to the south and south-east of the Site. Combined with the sensitivity of the LCT unit, this would result in a **moderate/ minor** and not-significant effect.
- 6.228 Beyond 12km, due to the distance from the Site and the influence of other nearby wind farms, the proposed development would introduce a low magnitude of change. Combined with the sensitivity of the LCT unit, this would result in a **moderate/ minor** and not-significant effect.

LCT 135: Rounded Hills Caithness & Sutherland (Loch Fiag Rounded Hills unit)

- 6.229 The LCT unit is located approximately 1km to the north and approximately 1.5km to the north-east of the proposed turbines at its closest point, therefore any effect discussed below would be indirect. Views from the LCT unit are represented by Viewpoint 2 (see **EIAR Volumes 3 and 5**).
- 6.230 Referring to **Figure 6.15**, theoretical visibility is mostly concentrated within western parts of the LCT unit closest to the proposed development, with limited or no theoretical visibility beyond 8km. Apart from limited areas of coniferous forestry plantation along the A836, which would limit the influence of the proposed development in these areas, it is considered that the actual visibility aligns with that shown on **Figure 6.15**. Areas within the LCT unit to the north-east of the Site are already influenced by Creag Riabhach wind farm.
- 6.231 Due to the relative open and remote nature of the landscape, the proposed development would be a clearly noticeable feature within the landscape, appearing prominent and influencing those rounded hills closest to the Site. The influence of the proposed development would be restricted by coniferous forestry plantation to the north-west of the Site and on opposing sides of hills, including north of Cnoc Maol na Cloiche Gil (405m AOD) and west of Cnoc a Ghriama (371m AOD). The proposed development would introduce a high/ medium magnitude of change upon the LCT unit at this distance. Combined with the sensitivity of the LCT unit, this would result in a **major/ moderate** and significant effect.
- 6.232 Between 5km to 8km, the pattern of rounded hills would limit the influence of the proposed development upon some areas of the LCT unit. Due to the elevated and remote nature of the landscape, the proposed development would have the potential to influence the physical and perceptual characteristics of the LCT unit. To the north-east, however, the landscape would already be influenced by Creag Riabhach wind farm. The proposed development would introduce a medium magnitude of change upon the LCT unit at a

distance between 5km to 8km, including to the north and north-east of the Site. Combined with the sensitivity of the LCT unit, this would result in a **moderate** and not-significant effect.

- 6.233 Beyond 8km, there is limited theoretical visibility of the proposed development, with the landscape already directly influenced by Creag Riabhach wind farm. The proposed development would introduce a very low magnitude of change, which when combined with the sensitivity of the LCT unit, would result in a **minor** and not-significant effect.

LCT 138: Lone Mountains

- 6.234 The LCT is located approximately 10km to the north-east of the proposed turbines at its closest point. Therefore, any effect discussed below would be indirect. Views from the LCT are represented by Viewpoint 13 (see **EIAR Volumes 3 and 5**).
- 6.235 Due to the elevated nature of the steep sided hillsides, theoretical visibility of the proposed development would be possible within south-western parts of the LCT, including from Creag an Lochain (808m AOD) and the peaks at Ben Klibreck, including Meall nan Con (961m AOD). Due to the intervening high land, most of the LCT to the north-east would however have no theoretical visibility. The LCT is already influenced by Creag Riabhach wind farm located adjacent to the A836 on lower ground to the south-west of the LCT.
- 6.236 Due to the influence of the Creag Riabhach wind farm in the foreground and at a distance of over 10km from the Site, the proposed development would have relatively limited influence upon the physical and perceptual characteristics of the landscape. The proposed development would introduce a medium/ low magnitude of change upon the LCT, which when combined with the sensitivity of the LCT, would result in a **moderate/ minor** not-significant effect.

LCT 139: Rugged Mountain Massif – Caithness & Sutherland

- 6.237 The LCT is located approximately 5km to the north-west of the proposed turbines at its closest point. Therefore, any effect discussed below would be indirect. Views from the LCT are represented by Viewpoints 7, 12, and A (see **EIAR Volumes 3 and 5**).
- 6.238 Referring to **Figure 6.15**, theoretical visibility is mostly sporadic in nature, concentrated upon higher areas of land, including from Ben More Assynt (see Viewpoint 12), Ben Hee (see Viewpoint 7) and Beinn Leoid (see Viewpoint A), as well as higher land to the west of the A838. Beyond these higher peaks, there is limited or no theoretical visibility of the proposed development.
- 6.239 Due to the steep, open and remote nature of the landscape, the proposed development would be a noticeable feature within the landscape that would influence the physical and perceptual characteristics of the landscape up to a distance of 9km from the proposed turbines. The proposed development would introduce a medium magnitude of change upon the LCT at a distance between 5km to 9km, including to the north and north-west of the Site. Combined with the sensitivity of the LCT unit, this would result in a **moderate** not-significant effect.
- 6.240 Due to the distance of over 9km from the Site and intervening landform, the proposed development would have relatively limited influence upon the physical and perceptual characteristics of the landscape. The proposed development would introduce no greater than a medium/ low magnitude of change upon the LCT, which when combined with the sensitivity of the LCT, would result in a **moderate/ minor** and not-significant effect.

LCT 142 – Strath – Caithness & Sutherland (Strath Tirry unit)

- 6.241 The LCT is located over 10km to the south-east of the proposed turbines at its closest point. Therefore, any effect discussed below would be indirect. Views from the LCT are represented by Viewpoints 11 and 14 (see **EIAR Volumes 3 and 5**).
- 6.242 When referring to **Figure 6.15**, theoretical visibility is limited over most of the LCT unit, with areas of coniferous forestry plantation to the north-east of the LCT unit limiting actual visibility of the proposed development. The LCT is already influenced by overhead powerlines with associated pylons crossing the LCT unit close to Loch Shin, two A-class roads, and by small settlements with associated roads.
- 6.243 Due to the distance of over 10km from the Site along with intervening vegetation and buildings, the proposed development would have relatively limited influence upon the physical and perceptual characteristics of the landscape. The proposed development would introduce a low magnitude of change upon the LCT unit, which when combined with the sensitivity of the LCT unit, would result in a **moderate/ minor** and not-significant effect.
- 6.244 A summary table of the effects on landscape character types during operation is provided below at **Table 6.7: Assessment of Effects on Landscape Character during Operation**.

Table 6.7: Assessment of Effects on Landscape Character during Operation

Landscape Character Type (unit)	Approximate distance/ direction from proposed development	Sensitivity	Magnitude of Change	Effect	Significant
LCT 134: Sweeping Moorland and Flows (Strath Fiag/Tirry unit)	4km to north and 5km to the north-east, east and south-east	Medium	High/ medium	Moderate	Yes
	4km to the west	Medium	Medium/ low	Moderate / minor	No
	5km to 8km to the north-east, east and south-east	Medium	Medium	Moderate	Yes
	8km to 12km to the north-east, east and south-east	Medium	Medium/ low	Moderate / minor	No
	Beyond 12km to the south-east	Medium	Very Low	Minor	No

LCT 135: Rounded Hills Caithness & Sutherland (Loch Shin Rounded Hills unit)	<i>Up to 5km to the south- west and south</i>	High	High/ medium	Major/ moderate	Yes
	<i>5km to 8km to the west, south and south-east</i>	High	Medium	Moderate	Yes
	<i>8km to 12km to the south and south-east</i>	High	Medium/ low	Moderate / minor	No
	<i>Beyond 12km to the south-west and south- east</i>	High	Low	Moderate / minor	No
LCT 135: Rounded Hills Caithness & Sutherland (Loch Fiaig Rounded Hills unit)	<i>Up to 5km to the north- west, north and north- east</i>	High	High/ medium	Major/ moderate	Yes
	<i>5km to 8km to the north and north-east</i>	High	Medium	Moderate	No
	<i>Beyond 8km to the north-east</i>	High	Very Low	Minor	No
LCT 138: Lone Mountains	<i>Beyond 10km to the north-east</i>	High	Medium/ low	Moderate / minor	No
LCT 139: Rugged Mountain Massif – Caithness & Sutherland	<i>5km to 9km to the north and north-west</i>	High	Medium	Moderate	No
	<i>Beyond 9km to the north-west and west</i>	High	Medium/ low	Moderate / minor	No
LCT 142: Strath – Caithness & Sutherland (Strath Tirry unit)	<i>Beyond 10km to the south-east</i>	Medium	Low	Moderate / minor	No

Bold text indicates a significant effect.

Effects on Designated Landscapes

International/ National Landscape Designations

- 6.245 As set out in **Technical Appendix 6.3**, all NSAs, apart from Assynt - Coigach NSA, have been scoped out of the assessment. Detailed consideration of the potential effects upon the special landscape qualities of Assynt - Coigach NSA is set out in **Technical Appendix 6.7**.
- 6.246 The assessment upon five of the ten special landscape qualities of the Assynt – Coigach NSA judged that there would be no significant effects as a result of the proposed development owing to distance and limited visibility, with any associative not significant effects occurring across a limited extent of the NSA, as evidenced by **Figures 6.31 and 6.34, and in Viewpoint 12 and Viewpoint A**.
- 6.247 Whilst the proposed development would increase the presence of wind turbines in views and reduce the visual separation between the NSA and existing (more distant) wind farms, its presence is not judged to result in any significant effects on any of the five SLQs assessed in detail that contribute to the Assynt-Coigach NSA, or any cumulative effects, particularly when considering the future baseline conditions brought about by the consented wind farms that would be located between the NSA and the proposed development.
- 6.248 It is acknowledged that the proposed development would result in some limited influence upon views from the Assynt-Coigach NSA over the wider landscape, particularly from the most elevated locations; however, all the qualities would remain extant and still be experienced. As a result, the appendix concluded that the overall integrity of the NSA would not be compromised.

Local Landscape Designations

Local Landscape Areas (LLA)

- 6.249 The Ben Klibreck and Loch Choire LLA lies approximately 9.5km to the north-east of the Site at its closest point and extends beyond 25km of the Site.
- 6.250 As set out in **Technical Appendix 6.3**, and as illustrated by **Figure 6.12**, there would be some theoretical visibility within western parts of the LLA from higher ground, including from Creag an Lochain (808m AOD), the peaks at Ben Klibreck, including Meall nan Con (961m AOD) and from higher land to the south-west of Loch a Bhealaich. Due to the intervening high land in western parts of the LLA, theoretical visibility would however be very limited within other parts of the LLA, limited to the peaks of Meall a Bhata (583m AOD) approximately 18km from the Site, and Creag Choire Ghlais (705m AOD), Creag Mhor (713m AOD) and Maol Coire a Mhile (598m AOD), all over 25km from the Site.
- 6.251 As previously set out, the LLA has four special landscape qualities (SLQ), namely:
- Distinctive mountains.
 - Secluded glen with network of tracks.
 - Extensive views from peaks and summits.
 - Historic landscape.
- 6.252 Consideration of potential landscape and visual effects within the LLA has been undertaken in detail in other sections of this chapter. The landscape receptors considered were LCT 138: Lone Mountains, and LCT 135: Rounded Hills Caithness & Sutherland (Loch

Fiag Rounded Hills unit) which lie beyond 8km from the proposed development. Visual effects from **Viewpoint 13: Ben Klibreck**, have also been considered in **Technical Appendix 6.5**. Whilst some adverse landscape and visual effects upon these receptors were identified as a result of the proposed development, they were considered to be not significant.

- 6.253 It is considered that the proposed development would have no influence upon select SLQs of the LLA, including '*Secluded glen with network of track*' or upon the '*Historic landscape*', mainly due to theoretical visibility being limited to higher land.
- 6.254 The proposed development would not directly affect the '*Distinctive mountains*' or their immediate setting. When considering the distance of the proposed development from the LLA, at approximately 9.5km or over, the proposed development would not affect the appreciation of the mountains to the west nor influence any of the mountains further to the east. It is however acknowledged that the proposed development may influence the appreciation of mountains from select distant locations surrounding the LLA, often seen in context of Creag Riabhach wind farm adjacent to the LLA.
- 6.255 When considering the '*Extensive views from peaks and summits*' SLQ, the proposed development would only influence those peaks to the west of the LLA, with other peaks only experiencing limited glimpses at distances of over 18km away. Creag Riabhach wind farm lies adjacent to the LLA, with any views towards the proposed development seen in context of its turbines and access tracks in the foreground.
- 6.256 In summary, whilst it is acknowledged that there would be some adverse, effects upon landscape character and visual amenity experienced from a small part of the LLA at distances over 8km, these were considered to be not significant. Similarly, whilst the proposed development is predicted to exert some influence upon two out of four of the SLQ of the LLA, namely '*Distinctive mountains*' and '*Extensive views from peaks and summits*'; overall, there would not be significant effects upon the special qualities of the Ben Klibreck and Loch Choire LLA, with all the qualities remaining extant and still able to be experienced. As a result, the overall integrity of the LLA would not be compromised.

Assessment of Visual Effects

- 6.257 Effects on visual amenity arise from changes to views resulting from the introduction of the proposed development. It comprises:
- An assessment of visual effects from the representative viewpoints brought forward into detailed assessment; and
 - An assessment of visual effects on receptor groups such as settlements, roads and railways, recreational routes, core paths, and recreational and tourism locations brought forward into detailed assessment.
- 6.258 The assessment of visual effects has been carried out through a combination of site visits and desk study using the ZTVs, wirelines, and photomontages (see **Volumes 2, 3, and 5**).
- 6.259 The assessment criteria for the approach to assessment of visual effects is set out in **Technical Appendix 6.1**. The approach and the methodology to the assessment of visible aviation lighting is set out in **Technical Appendix 6.8**.

Construction Effects

- 6.260 Construction activities associated with the proposed development would be screened from large portions of the study area, due to local topography and surrounding commercial coniferous forestry plantations. Activities would however be visible from elevated locations that allow views towards where the proposed development is located, as well as being visible from the nearby A838.
- 6.261 From the A838 to the south and south-west of the Site, glimpses of construction activity are likely to be possible, as shown on **Viewpoint 1: A838 near Fiag Bridge and Viewpoint 4: A838 near Sithean Dubh Mor**. Views towards construction activity would give rise to visual effects due to the removal of commercial coniferous forestry plantation to facilitate the proposed development; although, it is recognised that forestry directly adjacent to the A838 would be retained. Therefore, views are predicted to partly extend across the Site permitting views of construction activities and vehicular movements, in addition to the views of the cranes used to install the turbines. In these locations south and south-east along the A838, there would be a medium magnitude of change which would result in a **moderate** temporary effect during the construction phase, which would be not significant.
- 6.262 From those using Loch Fiag, due to the elevated location in comparison to the Site and the removal of commercial coniferous forestry plantation to facilitate the proposed development, views towards construction activity would likely to be possible, as shown on **Viewpoint 2: Loch Fiag**. There would be a medium magnitude of change to those using Loch Fiag, which would result in a **moderate** temporary effect during the construction phase, which would be not significant.
- 6.263 From elevated locations surrounding the Site, including from Maovally, Ben Hee, and Ben Squireach, views extend across the Site, which would permit views of construction activities and vehicular movements, in addition to the views of the cranes used to install the turbines, as shown in **Viewpoint 6: Maovally, Viewpoint 7: Ben Hee, and Viewpoint 10: Ben Squireach**. In these locations, there would be a medium magnitude of additional change which would result in a **moderate**, temporary effect during the construction phase which would be not significant.
- 6.264 From more distant elevated locations, including from Ben More Assynt, Ben Klibreck (Meall nan Con), and Beinn Leoid, construction activities and vehicular movements, in addition to the views of the cranes used to install the turbines, would be less apparent, as shown in **Viewpoint 12: Ben More Assynt, Viewpoint 13: Ben Klibreck (Meall nan Con) and Viewpoint A: Beinn Leoid**. In these locations, there would be a low magnitude of additional change which would similarly result in a **moderate/ minor**, temporary effect during the construction phase which would be not significant.
- 6.265 From all other remaining viewpoints, ground-level activities would be screened through a combination of landform and vegetation. In these locations, there is the prospect for visual effects to arise in relation to views of the cranes erecting the turbines. The cranes would however be visible for a relatively short period and would be incidental when considered in the context of the turbines being erected. It is therefore assessed that any views of these works would result in a very low magnitude of additional change and no greater than a **minor**, temporary effect which would be not significant.

Operational Effects

- 6.266 A detailed viewpoint assessment of the operational effects is presented at **Technical Appendix 6.5: Viewpoint Assessment**, and this considers the long-term visual effects during the operational phase of the proposed development for each of the 20no. agreed

viewpoint locations. Visual effects are considered during daylight hours, as well as during darkness hours.

- 6.267 For each of the assessment viewpoints, a short description is given of the baseline view, and a judgement is provided regarding the sensitivity of the key receptors likely to experience the view during daylight and darkness hours.
- 6.268 This is followed by a description of the features of the proposed development that would be visible from that viewpoint. This includes a description of how many turbine hubs and blades would be visible and also, where relevant, whether any ground-level components of the proposed development would be visible. For each viewpoint, there is a comment on how vegetation or topography would affect actual visibility of the proposed turbines.
- 6.269 A judgement is then provided of the magnitude of change that would be experienced at each viewpoint, the level of the effect on the view, with a statement provided to clarify whether the additional effect resulting from the proposed development would be significant or not.
- 6.270 A summary of the sensitivity of the view, magnitude of change in the view, the level of effect and its significance, both during daylight and darkness hours is given in **Table 6.8: Assessment of Effects on Viewpoints during Operation**. A copy of the table is also included in **Technical Appendix 6.5: Viewpoint Assessment**.
- 6.271 Where a viewpoint is representative of more than one type of visual receptor, the assessment carried forward into **Table 6.8** represents the most sensitive receptor group represented by the viewpoint.
- 6.272 With reference to the Viewpoint Assessment (see **Technical Appendix 6.5**), it has been assessed that there would be a significant visual effect at 8no. of the 20no. representative viewpoints during daylight hours when considering the proposed against the existing baseline conditions. These are as follows:
- Viewpoint 1: A838 near Fiag Bridge.
 - Viewpoint 2: Loch Fiag.
 - Viewpoint 4: A838 near Sithean Dubh Mor.
 - Viewpoint 5: A836 near Crask Inn.
 - Viewpoint 6: Maovally.
 - Viewpoint 7: Ben Hee.
 - Viewpoint 8: Ariscaig; and
 - Viewpoint 10: Ben Sgeireach.
- 6.273 It was further assessed that during the hours of darkness there would be a significant visual effect at 3no. of the 20no. representative viewpoints. These are as follows:
- Viewpoint 1: A838 near Fiag Bridge.
 - Viewpoint 2: Loch Fiag; and
 - Viewpoint 4: A838 near Sithean Dubh Mor.

Table 6.8: Assessment of Effects on Viewpoints during Operation

Viewpoints	Daylight Hours				Darkness Hours			
	Sensitivity	Magnitude of Change	Level of Effect	Significant	Sensitivity	Magnitude of Change	Level of Effect	Significant
1: A838 near Fiag Bridge (N)	Medium	High	Moderate	Yes	Medium/ low	Medium	Moderate	Yes
2: Loch Fiag	High	High	Major	Yes	High/ medium	High/ medium	Major/ moderate	Yes
3: A838 near Overscaig Hotel (N)	High/ medium	Medium/ low	Moderate/ minor	No	Medium	Low	Moderate/ minor	No
4: A838 near Sithean Dubh Mor	Medium	High/ medium	Moderate	Yes	Medium/ low	Medium	Moderate	Yes
5: A836 near Crask Inn	High/ medium	High/ medium	Major/ moderate	Yes	Medium/ low	Medium	Moderate	No
6: Maovally	High	High/ medium	Major/ moderate	Yes	High/ medium	Medium/ low	Moderate/ minor	No
7: Ben Hee	High	Medium	Moderate	Yes	High/ medium	Medium/ low	Moderate/ minor	No
8: Arscaig	High	Medium	Moderate	Yes	High/ medium	Medium/ low	Moderate/ minor	No
9: A838 near West Shinness Lodge	High/ medium	Medium/ low	Moderate/ minor	No	Medium	Low	Moderate/ minor	No
10: Ben Sgeireach	High	Medium	Moderate	Yes	High/ medium	Medium/ low	Moderate/ minor	No
11: A836 Rhian Bridge	High/ medium	Low/ very low	Moderate/ minor	No	Medium/ low	Very low	Minor	No
12: Ben More Assynt	High	Medium	Moderate	No	High/ medium	Low	Moderate/ minor	No
13: Ben Klibreck (Meall nan Con)	High	Medium/ low	Moderate/ minor	No	High/ medium	Very low	Minor	No

Viewpoints	Daylight Hours				Darkness Hours			
	Sensitivity	Magnitude of Change	Level of Effect	Significant	Sensitivity	Magnitude of Change	Level of Effect	Significant
14: A836 near An t-Sron (N)	High/ medium	Medium/ low	Moderate/ minor	No	Medium/ low	Very low	Minor	No
15: The Ord	High	Medium/ low	Moderate/ minor	No	High/ medium	Very low	Minor	No
16: Torroble (N)*	High/ medium	Medium/ low	Moderate/ minor	No	Medium/ low	Very low	Minor	No
A: Beinn Leoid*	High	Medium	Moderate	No	High/ medium	Low	Moderate/ minor	No
B: Ben Hope*	High	Low	Moderate/ minor	No	High/ medium	Very low	Minor	No
C: Ben Loyal*	High	Low	Moderate/ minor	No	High/ medium	Very low	Minor	No
D: Càrn a' Choin Deirg*	High	Very low	Minor	No	High/ medium	Very low	Minor	No

Bold text indicates a significant effect.

* Additional LVIA Viewpoint added following feedback received at scoping.

(N) Night-time visualisation produced from this viewpoint in addition to day-time visualisation.

Assessment of Effects on Principal Visual Receptor Groups

- 6.274 This section considers the effects of the proposed development on the visual receptor groups brought forward into detailed assessment (see **Technical Appendix 6.4: Preliminary Assessment of Visual Receptors** for details). Principal visual receptors are illustrated on **Figures 6.18 and 6.19**, with **Figure 6.20** illustrating the blade tip ZTV overlaid over the visual receptors located within the detailed 20km LVIA study area.

Construction Effects on Visual Receptor Groups

- 6.275 It is recognised that there would be some temporary visual effects during the construction phase of the proposed development. The vast majority of noteworthy visual effects would be experienced within the local environs of the Site, with views from wider distances being commonly constrained by intervening landform and vegetation including coniferous plantation forestry and broadleaved woodland.
- 6.276 The construction works would be visible from a number of properties within the local landscape; however, views of the construction phase would largely be restricted to views of cranes appearing above intervening landform and vegetation. Ground-level components and activities would primarily be screened from view. These views would only be experienced for a relatively short duration during the construction phase, and within the context of the proposed turbines being constructed.
- 6.277 From most visual receptors, the cranes would be visible for a relatively short period and would be incidental when considered in the context of the turbines being erected. Overall, it is assessed that there would be a low magnitude of additional effect at most during construction. This would result in a **moderate/ minor**, temporary effect which would be not significant, and these effects need to be considered in conjunction with the operational effects identified below.
- 6.278 The except to the above would be from select locations along the A838 up to approximately 8km from the proposed development, as there is judged to be a medium magnitude of change which would result in a **moderate** temporary effect during the construction phase, which would be not significant.

Operational Effects on Visual Receptor Groups

- 6.279 Views of ground-level components and activities associated with the proposed development would be limited to a relatively short radius around the Site and/or experienced from receptors at elevated locations. Except where indicated, the discussion below therefore relates primarily to views of the proposed turbines.

Residential Receptors

- 6.280 In accordance with the methodology set out in **Technical Appendix 6.1**, the sensitivity of residents at home is considered to be high during daylight hours. During darkness hours, the sensitivity of residents is considered to be medium, in accordance with the methodology set out in **Technical Appendix 6.8**.

Residential Properties within 4km

- 6.281 All properties located within a 4km distance of a proposed turbine have been assessed in detail within the RVAA (see **Technical Appendix 6.6: Residential Visual Amenity Assessment (RVAA)**). The properties subject to detailed assessment in the RVAA are as

illustrated on **Figure 6.6.1: Residential Data with Blade Tip ZTV** and **Figure 6.6.2: Residential Data with Hub Height Tip ZTV**.

- 6.282 In summary, of the 7no. properties assessed in detail, 1no. would experience a significant visual effect from either a part of their house, garden, or principal access route.
- 6.283 It is concluded that when the experience from each property is considered that none of the residents of any occupied private property would experience such an overbearing or overwhelming effect on their visual amenity that their properties would become unattractive places in which to live.

Residential properties and settlements between 4km to 5km

Aultnacoarach

- 6.284 Aultnacoarach is an individual property adjacent to Allt na Caorach watercourse, located on elevated ground adjacent to the A838, located approximately 4.7km to the south-east of the nearest proposed turbine.
- 6.285 The property is orientated to face both north-east and south-west and therefore, the proposed development would be seen at an oblique angle. All 15no. proposed turbines, including their hubs, would be visible and seen on the skyline. Whilst the proposed development would be partly obscured by coniferous forestry and landform, it would be clearly noticeable within the landscape. When considering these factors, the proposed development is judged to result in a high/ medium magnitude of change during daylight hours. Combined with the sensitivity of the receptor, this would result in a **major/ moderate**, significant effect during daylight hours.
- 6.286 Whilst the proposed aviation lights would be visible, occurring within an area with very few existing light sources, due to the low level of lighting intensity, the lights would appear as faint red dots against the backdrop of the sky. The change in lighting would occur in a part of the landscape with very few existing light sources. When considering these factors, the proposed development is judged to result in a medium magnitude of change during darkness hours. Combined with the sensitivity of the receptor, this would result in a **moderate**, significant effect during darkness hours.

Residential Properties and Settlements within 5km to 15km

Shinness

- 6.287 Shinness consists of a small group of properties located close to Loch Shin along the A838 and along a minor road to the north-east of the road. The settlement is located approximately 8.5km to the south-east of the proposed development and is dissected by an overhead powerline with associated pylons. Most of the residential properties are orientated in a south-westerly direction, facing the loch.
- 6.288 Most of the proposed turbines would be visible on the skyline, appearing relatively well spaced and seen above intervening landform. Those properties located along the A838 would have relatively filtered views towards the proposed development due to the vegetation along the road and surrounding the properties.
- 6.289 The properties further to the north-east benefit from an open aspect. With more limited vegetation surrounding the properties and along the minor road, the proposed development would be clearly noticeable on the skyline. When considering these factors, the proposed development is judged to result in a medium magnitude of change during

daylight hours. Combined with the sensitivity of the receptor, this would result in a **moderate**, significant effect during daylight hours.

- 6.290 Whilst the proposed turbine aviation lighting would be potentially visible, occurring within an area with very few existing light sources, due to the low level of lighting intensity, the lights would appear as faint red dots against the backdrop of the sky. When considering these factors, the proposed development is judged to result in a medium/ low magnitude of change during darkness hours. Combined with the sensitivity of the receptor, this would result in a **moderate/ minor**, not-significant effect during darkness hours.

Achnairn and Tirryside

- 6.291 The small settlements consist of scattered properties located along the A838 and other minor roads to the north-east. Achnairn is located approximately 12.25km to the south-east of the proposed development, whilst Tirryside is located approximately 14.5km to the south-east. Both settlements are dissected by an overhead powerline with associated pylons.
- 6.292 Most views from the properties located adjacent to the A838 are surrounded by either vegetation within their gardens or located adjacent to areas of woodland along the road, which serve to filter views towards the proposed development. Due to intervening landform, those properties to the north-east would have no view towards the proposed development. When considering these factors, the proposed development is judged to result in no more than a medium/ low magnitude of change during daylight hours. Combined with the sensitivity of the receptor, this would result in a **moderate/ minor**, not-significant effect during daylight hours.
- 6.293 Whilst the proposed turbine aviation lighting would be visible from some properties, those properties further to the north-east would have no view of the proposed lighting. Despite being within an area with very few existing light sources, due to the low level of lighting intensity, the lights would appear as faint red dots against the backdrop of the sky. When considering these factors, the proposed development is judged to result in a no greater than low magnitude of change during darkness hours. Combined with the sensitivity of the receptor, this would result in a **moderate/minor**, not-significant effect during darkness hours.

Lairg

- 6.294 Lairg is a village located at the south-eastern end of Loch Shin, located approximately 18.5km to the south-east of the proposed development. Lairg is enclosed by gently rising landform, which is located to the south-west, east, and north of the village.
- 6.295 There is no predicted theoretical visibility of the proposed development within the main part of the village, including from along the A836, The Main Street, Manse Road, and Lochside. Some theoretical visibility occurs to the south of the settlement close to the junction of the A836 and A839 and Ord Place; however, most views towards the proposed development would be filtered by Ferry Wood and Lairg Power Station. When considering these factors, the proposed development is judged to result in no more than a low magnitude of change during daylight hours. Combined with the sensitivity of the receptor, this would result in a **moderate/ minor**, not-significant effect during daylight hours.
- 6.296 Most of the main streets within Lairg include street lighting. Whilst the turbine aviation lights would result in a higher level of lighting intensity, any glimpses towards the nacelle turbine lighting would be seen in context of the streetlights in the foreground and be filtered by intervening vegetation and Lairg Power Station. As Lairg is located beyond 5km of the

nearest proposed lit turbine (circa 18.5km distance) the maximum nacelle lighting intensity that could be experienced would be 200cd. When considering these factors, the proposed development is judged to result in a very low magnitude of change during darkness hours. Combined with the sensitivity of the receptor, this would result in a **minor**, not-significant effect during darkness hours.

Table 6.9: Assessment of Effects on Residential Receptors during Operation

Property/ Settlement	Daylight Hours			Hours of Darkness		
	Magnitude of Change	Effect	Significant	Magnitude of Change	Effect	Significant
Aultnacoarach	High/ medium	Major/ moderate	Yes	Medium	Moderate	Yes
Shinness	Medium	Moderate	Yes	Medium/ low	Moderate/ minor	No
Achnairn and Tirryside	Medium/ low	Moderate/ minor	No	Low	Moderate/ minor	No
Lairg	Low	Moderate/ minor	No	Very Low	Minor	No

Recreational Receptors

- 6.297 The following assessment focuses on recreational receptors, which includes core paths and long-distance footpaths and cycle routes. The section concentrates upon those receptors identified during the filtering exercise at **Technical Appendix 6.4: Preliminary Assessment of Visual Receptors**, as having the greatest potential to experience significant effects, and therefore requiring further analysis and assessment.
- 6.298 In accordance with the methodology set out in **Technical Appendix 6.1: Landscape and Visual Impact Assessment Criteria**, the sensitivity of recreational receptors can vary between medium and very high depending on the reason for which they are using the route. For the purposes of the assessment, a sensitivity of high has been assumed for each recreational receptor during daylight hours. During darkness hours, in accordance with the methodology set out in **Technical Appendix 6.8**, the sensitivity of recreational receptors is considered to be medium.
- 6.299 A summary of the effects is presented at **Table 6.10: Assessment of Effects on Recreational Receptors during Operation**.

Core Path SU16.03 Ord Hill

- 6.300 The core path is located approximately 19km to the south-east of the proposed development. The core path offers a short loop to elevated ground, namely The Ord, which allows access to the chambered cairn. The path can be accessed from Ord Place to the south-west of Lairg.
- 6.301 As the core path rises up to The Ord, views become more open and panoramic, with the proposed development visible along Loch Shin, seen partly above distant hills. The proposed development would appear compact with a limited field of view; however,

many turbines would appear stacked or overlapping when travelling along the path. It is considered that due to the distance from the proposed development and the context of the path, there would be some change in the view, which would be considered not prominent. When considering these factors, the proposed development is judged to result in a no greater than a medium/ low magnitude of change during daylight hours. Combined with the sensitivity of the receptor, this would result in a **moderate/ minor**, not-significant effect during daylight hours.

- 6.302 During the hours of darkness, all six nacelle lights would be theoretically visible from most of the core path. The relative elevation of the viewpoint in comparison with the turbine lights would result in a higher level of lighting intensity; however, the turbine lights would appear as faint red dots against the backdrop of the sky or distant hills. As The Ord is located beyond 5km of the nearest proposed lit turbine (circa 19km distance) the maximum nacelle lighting intensity that could be experienced would be 200cd. The change in lighting would occur in a part of the landscape with existing light sources in the foreground including the settlement of Lairg and scattered properties either side of Loch Shin. When considering these factors, the proposed development is judged to result in a very low magnitude of change during darkness hours. Combined with the sensitivity of the receptor, this would result in a **minor**, not-significant effect during darkness hours.

Core Path SU16.10 Loch Craggie

- 6.303 The 6km long core path provides a linear route from a minor road north-east of Lairg, following an access track up to Loch Dola, then through Dalchork Wood up to the south-eastern edge of Loch Craggie. The path is located approximately 18.75km to the south-east of the Site at its closest point, with parts of the path lying beyond 20km.
- 6.304 The first 1km of the path to the west has no theoretical visibility, with nearly 3km located within Dalchork Wood with very limited outward visibility. Short sections of the path would have potential theoretical visibility, limited in part by intervening areas of woodland associated with Dalchork Wood. Most views towards the proposed development are likely to be limited to glimpses of blade tips only. Due to the distance of the core path from the proposed development and owing to the limited glimpsed nature of views from the path, a no greater than low magnitude of change during daylight hours is predicted. Combined with the sensitivity of the receptor, this would result in a **moderate/ minor**, not-significant effect during daylight hours.
- 6.305 During the hours of darkness, views towards the nacelle lighting would likely be intermittent in nature. Whilst the relative elevation of the path in comparison to the turbine lights would result in a higher level of lighting intensity, the turbine lights would appear as faint red dots against the backdrop of the sky or distant hills. As the path is located beyond 5km of the nearest proposed lit turbine (circa 19km distance) the maximum nacelle lighting intensity that could be experienced would be 200cd. The change in lighting would occur in a part of the landscape with very few existing light sources. When considering these factors, the proposed development is judged to result in a very low magnitude of change during darkness hours. Combined with the sensitivity of the receptor, this would result in a **minor**, not-significant effect during daylight hours.

Core Path SU16.05 Loch Shin Hide

- 6.306 This very short circa 500-600m long core path provides access from the A836 to a bird hide close to the edge of Loch Hide which is located approximately 15.75km to the south-east of the Site at its closest point.

- 6.307 The path follows an access track down towards the bird hide, passing through woodland either side of the track, which would likely serve to limit outward views, including towards the proposed development. From the bird hide, with views likely to be over Loch Shin, the proposed development would appear on the skyline. The proposed turbines would appear relatively clustered together, with some likely to overlap with one another. At a distance of nearly 16km from the proposed development, it is predicted that views towards the proposed development would not appear prominent. When considering these factors, the proposed development is judged to result in a medium/ low magnitude of change during daylight hours. Combined with the sensitivity of the receptor, this would result in a **moderate/ minor**, not-significant effect during daylight hours.
- 6.308 During the hours of darkness, all six nacelle lights would be theoretically visible from the bird hide and limited sections of the access track. Whilst there would be a higher level of lighting intensity, the turbine lights would appear as faint red dots against the backdrop of the sky or distant hills. As the path is located beyond 5km of the nearest proposed lit turbine (circa 16km distance) the maximum nacelle lighting intensity that could be experienced would be 200cd. The change in lighting would occur in a part of the landscape with very few existing light sources. Due to the distance of the proposed lighting from the hide, the proposed development is judged to result in a very low magnitude of change during darkness hours. Combined with the sensitivity of the receptor, this would result in a **minor**, not-significant effect during darkness hours.

John O'Groats Cycle Route

- 6.309 The John O'Groats Cycle Route follows the A836 near to the Site, as well as passing through Lairg to the south-east. The cycle route passes approximately 6km east of the proposed development at its closest point and is shown on **Figures 6.18-6.20**.
- 6.310 Along a number of locations, the proposed development would either be obscured by intervening vegetation or have limited or no theoretical visibility. These locations include beyond 8km to the north-east along the A836 with limited or no theoretical visibility of the proposed development, south of Creag Riabhach wind farm where tree cover along both sides of the A836 would restrict views towards the proposed development for an approximate 1.5km stretch and approximately 7.5km south-east of the Site for an approximate 4km stretch where the route passes through established coniferous forestry plantation. In addition, there would be no theoretical visibility of the proposed development from the route to the south of Lairg, where the route follows the B864, located approximately 19km to the south-east. Therefore, the above stretches of the John O'Groats Cycle Route are not considered further within the assessment.

Near Crask Inn to the east

- 6.311 For an approximate 1.5km stretch close to Crask Inn to the east of the proposed development, the route crosses relatively open moorland, before following an additional 3.5km stretch of recently felled coniferous plantation. Oblique views from the route would be possible towards the proposed development, at a distance of approximately 6km at its closest point. Whilst some of the proposed turbines would likely be partly obscured by intervening landform, all turbines would be visible to some extent and visible on the skyline or distant hills. The proposed development would appear well spaced whilst travelling along the route, albeit extending over a wide field of view. When considering these factors, the proposed development is judged to result in a worst-case high/ medium magnitude of change during daylight hours. Combined with the sensitivity of the receptor, this would result in a **major/ moderate**, significant effect during daylight hours.

- 6.312 During the hours of darkness, most of the nacelle lights would be intermittently theoretically visible from the route. With the relative lower elevation of this section of the route in comparison to the turbine lights, the turbine lights would likely result in a lower level of lighting intensity, appearing as faint red dots against the backdrop of the sky or distant hills. The change in lighting would occur in a part of the landscape with very few existing light sources, seen in context of headlights associated with vehicular movements along the A836. When considering these factors, the proposed development is judged to result in a worst-case medium magnitude of change during darkness hours. Combined with the sensitivity of the receptor, this would result in a **moderate**, not-significant effect during darkness hours.
- 6.313 It is recognised that the areas of recently felled coniferous plantation have been replanted and therefore, in the longer term, the cycle route would pass through an area of forestry with limited outward views. Whilst the assessment considers the worst-case scenario, assuming that there is no forestry in place, it is acknowledged that there would be periods of time over the operational phase of the proposed development when the effects would be less than predicted.

Between Rhian Bridge and Lairg

- 6.314 For an approximate 11.5km stretch to the south-east of the Site, from Rhian Bridge (approximately 11km from the proposed development) to Lairg (approximately 19km from the proposed development), the proposed development would be intermittently theoretically visible from the cycle route. Oblique views towards the proposed development from the route would be possible, limited in part by areas of vegetation along the road, as well as by intermittent blocks of coniferous forestry plantation, with views being fleeting and incidental in nature. Therefore, it is predicted that any views towards the proposed development would not be prominent. When considering these factors, the proposed development is judged to result in a no greater than a medium to low magnitude of change during daylight hours. Combined with the sensitivity of the receptor, this would result in a **moderate/ minor**, not-significant effect during daylight hours.
- 6.315 During the hours of darkness, the nacelle lights would be theoretically visible from the cycle route; however, due to vegetation and coniferous forestry plantation in the foreground, views towards the lights would be intermittent and filtered. The turbine lighting intensity would vary along the cycle route; however, at distances of 11km or over, the lights would appear as faint red dots against the backdrop of the sky or distant hills. The change in lighting would occur in a part of the landscape with very few existing light sources, seen in context of vehicular movements along the A836. When considering these factors, the proposed development is judged to result in a worst-case low magnitude of change during darkness hours. Combined with the sensitivity of the receptor, this would result in a **moderate/ minor**, not-significant effect during darkness hours.

Table 6.10: Assessment of Effects on Recreational Receptors during Operation

Recreational Receptor	Daylight Hours			Hours of Darkness		
	Magnitude of Change	Effect	Significant	Magnitude of Change	Effect	Significant
Core Path SU16.03 Ord Hill	Medium/low	Moderate/minor	No	Very low	Minor	No
Core Path SU16.10 Loch Craggie	Low	Moderate/minor	No	Very low	Minor	No
Core Path SU16.05 Loch Shin Hide	Medium/low	Moderate/minor	No	Very low	Minor	No
John O'Groats cycle route – near Crask Inn to the east	High/medium	Major/moderate	Yes	Medium	Moderate	No
John O'Groats cycle route – between Rhian Bridge and Lairg	Medium/low	Moderate/minor	No	Low	Moderate/minor	No

Bold text indicates a significant effect.

Effects on Roads and Rail

- 6.316 A summary of the sensitivity of the view, magnitude of change in the view, the level of effect and its significance is given in **Table 6.11: Assessment of Effects on Roads during Operation**.
- 6.317 In accordance with the methodology set out in **Technical Appendix 6.1: Landscape and Visual Impact Assessment Criteria**, the sensitivity of road receptors can vary between low and high depending on the reason for which they are using the route. For the purposes of the assessment, a sensitivity of medium has been assumed for each road receptor during daylight hours. The exception to this is where the road forms part of a cycle route, where a high sensitivity is assumed.
- 6.318 During darkness hours, in accordance with the methodology set out in **Technical Appendix 6.8**, the susceptibility of road receptors is considered to be medium for users of public rights of way and minor roads, and low for users of trunk/ major roads, and passengers on commercial railway lines (except where these form part of a recognised and promoted scenic route). Whilst the sensitivity of the A-class roads in the study area are considered to fluctuate slightly depending on locale, broadly speaking, they have been assigned a medium/ low sensitivity rating.

A838

- 6.319 The A838 extends from the junction with the A836 to the south-east of the Site, where it passes along the north-western edge of Loch Shin, up to the southern edge of the Site. Beyond the Site, the road heads to the north-west passing Loch a Ghriama, Loch Merkland and Loch More. The A838 extends up to Durness and then follows the northern coast where it terminates at Tongue.

- 6.320 Beyond 4km to the west of the Site, the road is not covered by any theoretical visibility and therefore, this part of the road is not considered further within the assessment.

West and north-west up to 4km

- 6.321 The road follows relatively close to the edge of Loch Shin, with views towards the Site, particularly for south-east travelling receptors, largely obscured by rising landform and coniferous forestry plantation. Most of the proposed development would be either obscured by the foreground forestry and by the scattered pattern of built form and vegetation close to the A838. Most views of proposed turbines would be limited to glimpses of blade tips, with only select turbine hubs intermittently visible above intervening vegetation, as shown on **Viewpoint 3**. When considering these factors, the proposed development is judged to result in a medium/ low magnitude of change during daylight hours. Combined with the sensitivity of the receptor, this would result in a **moderate/ minor**, not-significant effect during daylight hours.

- 6.322 During the hours of darkness, the nacelle lights would be intermittently obscured by forestry and other intervening vegetation. Despite the proximity of receptors travelling along the A838 to the proposed development, with the relative lower elevation of the viewpoint in comparison with the turbine lights, the turbine lights would likely result in a low level of lighting intensity, so any glimpses of the lights would appear as faint red dots against the backdrop of the sky. The change in lighting would occur in a part of the landscape with very few existing light sources aside from lighting at nearby properties and vehicular movements on the road. When considering these factors, the proposed development is judged to result in a low magnitude of change during darkness hours. Combined with the sensitivity of the receptor, this would result in a **moderate/ minor**, not-significant effect during darkness hours.

South-east up to 5km

- 6.323 Despite some limited sections of the road where the proposed development would not be visible, the proposed turbines are predicted to appear prominent along open parts of the road within 5km, particularly when travelling in a north-westerly direction. Whilst landform and the coniferous forestry plantation would partly obscure the towers of some turbines, all turbines, including hubs, would be clearly visible on the skyline, as shown by **Viewpoint 1 and Viewpoint 4**. When considering these factors, the proposed development is judged to result in a high or high/ medium magnitude of change during daylight hours. Combined with the sensitivity of the receptor, this would result in a **moderate**, significant effect during daylight hours.

- 6.324 During the hours of darkness, all nacelle lights would be theoretically visible from most of the road within 5km to the south-east of the Site. Despite the proximity of those travelling along the A838, with the relative lower elevation of the viewpoint in comparison with the turbine lights, the turbine lights would likely result in a low level of lighting intensity, appearing as faint red dots against the backdrop of the sky. The change in lighting would occur in a part of the landscape with very few existing light sources, seen in context of lighting from nearby properties and vehicular movements along the A838. When considering these factors, the proposed development is judged to result in a medium magnitude of change during darkness hours. Combined with the sensitivity of the receptor, this would result in a **moderate**, significant effect during darkness hours.

South-east between 5km to 8km

- 6.325 Beyond 5km of the proposed development, road users travelling in a north-westerly direction become intermittently set within pockets of forestry, woodland, or more moorland or scrubby vegetation along both sides of the road. The intermittent vegetation serves to limit some direct views towards the proposed development; however, for those travelling in a north-westerly direction, the proposed turbines would still be clearly noticeable from select locations up to 8km. When considering these factors, the proposed development is judged to result in a no greater than medium magnitude of change during daylight hours. Combined with the sensitivity of the receptor, this would result in a **moderate**, significant effect during daylight hours.
- 6.326 During the hours of darkness, most of the nacelle lights would be visible from road, filtered by the pattern of intervening vegetation. The turbine lights would likely have a lower level of lighting intensity and appear as faint red dots against the backdrop of the sky or distant hills. The change in lighting would occur in a part of the landscape with very few existing light sources, seen in context of vehicular movements along the A838. When considering these factors, the proposed development is judged to result in a medium to low magnitude of change during darkness hours. Combined with the sensitivity of the receptor, this would result in a **moderate/ minor**, not-significant effect during darkness hours.

South-east beyond 8km

- 6.327 Beyond 8km, views toward the proposed development for road users travelling in a north-westerly direction would be possible; although, they would become further filtered by vegetation along the road, including areas of coniferous forestry plantation. Intervening landform would likely partly obscure turbine towers, with intermittent views of the proposed turbines appearing relatively clustered together and visible on the skyline or distant hills, as shown by **Viewpoint 9**. Further to the south-east, views towards the proposed development would become oblique due to the orientation of the road and appear fleeting and incidental in nature. When considering these factors, the proposed development is judged to result in a medium/ low magnitude of change during daylight hours. Combined with the sensitivity of the receptor, this would result in a **moderate/ minor**, not-significant effect during daylight hours.
- 6.328 During the hours of darkness, nacelle lights would be glimpsed, filtered by the pattern of vegetation along the road. The turbine lighting intensity would vary along the road; however, at distances of 8km or over, the lights would appear as faint red dots against the backdrop of the sky or distant hills. The change in lighting would occur in a part of the landscape with very few existing light sources except for lights from scattered properties along the edge of Loch Shin and vehicular movements along the A838. When considering these factors, the proposed development is judged to result in a worst-case low magnitude of change during darkness hours. Combined with the sensitivity of the receptor, this would result in a **moderate/ minor**, not-significant effect during darkness hours.

A836

- 6.329 The route of the A836 is used for the John O'Groats Cycle Route through the study area. Subsequently, the results of the assessment for the John O'Groats Cycle Route are considered to be consistent with those that would be identified for the A836. No further assessment is therefore provided for A836.

A839

- 6.330 The A839 passes through Lairg where it is located approximately 19km to the south-east of the Site at its closest point. The road provides a route from Rosehall to the A9 near Golspie where it follows Strath Fleet.
- 6.331 Limited glimpses towards blade tips of the proposed development would be possible from elevated locations of the A-class road to the north-east of Lairg, limited by intervening foreground vegetation close to the road. Within Lairg, most views towards the proposed development would be filtered by Ferry Wood and Lairg Power Station. When considering these factors, the proposed development is judged to result in no more than a low magnitude of change during daylight hours. Combined with the sensitivity of the receptor, this would result in a **moderate/ minor**, not-significant effect during daylight hours.
- 6.332 Any glimpses towards the nacelle turbine lighting would be seen in context of the street and property lights in the foreground at distances of over 19km. When considering these factors, the proposed development is judged to result in a very low magnitude of change during darkness hours. Combined with the sensitivity of the receptor, this would result in a **minor**, not-significant effect during darkness hours.

Moray Firth Tourist Route

- 6.333 The Moray Firth Tourist Route provides an 80-mile scenic driving route between Inverness and the A839 junction with the A9 near Golspie, offering an alternative to the A9. The route is located approximately 19km to the south-east of the Site at its closest point.
- 6.334 The route would follow the A893 to the north-west of Lairg and the A836 to the south of Lairg, with the levels of effect predicted to replicate those as set out above from these roads. As a result, a **moderate/ minor** not significant effect would occur during daylight hours, and a **minor** not significant effect would occur during darkness hours.

Table 6.11: Assessment of Effects on Roads during Operation

Road Receptor	Daylight Hours			Hours of Darkness		
	Magnitude of Change	Effect	Significant	Magnitude of Change	Effect	Significant
A838 – west and north-west up to 4km	Medium/ low	Moderate/ minor	No	Low	Moderate/ minor	No
A838 – south-east up to 5km	High	Moderate	Yes	Medium	Moderate	Yes
A838 – south-east between 5km to 8km	Medium	Moderate	Yes	Medium/ low	Moderate/ minor	No
A838 – south-east beyond 8km	Medium/ low	Moderate/ minor	No	Low	Moderate/ minor	No
A836	Refer to visual effects upon Inverness to John O'Groats Cycle Route					

A839	Low	Moderate/ minor	No	Very Low	Minor	No
Moray Firth Tourist Route	Low	Moderate/ minor	No	Very Low	Minor	No

Bold text indicates a significant effect.

Mitigation

6.335 As discussed in best practice guidance for EIA, mitigation measures may include:

- Avoidance of effects.
- Reduction in magnitude of effects; and
- Compensation for effects (which may include enhancements to offset any adverse effects).

Embedded Mitigation

- 6.336 The primary mitigation adopted in relation to the proposed development is embedded within the design of the proposed development and relates to the consideration that was given to avoiding and minimising landscape and visual effects during the evolution of the proposed development layout. This is sometimes referred to as 'mitigation by design.' A detailed discussion of the design evolution and the iterative process underpinning it is provided in **Chapter 4: Design Evolution**. Design evolution is summarised below, in so far, as landscape and visual matters have influenced the proposed development.
- 6.337 The EIA scoping layout was based on 22no. proposed turbines with blade tip heights up to 230m. The layout then progressed through a series of smaller iterations based upon ground conditions and landscape and visual considerations. Visual considerations were a key consideration with turbines removed to reduce the lateral extents of the wind farm from key viewpoints; however, noting the minor increase in height up to 250m. The extent of the Zone of Theoretical Visibility was taken into consideration for this design decision. From analysis, the increase in turbine tip height to 250m translated to a 0.5% increase in visibility across study area and from wireline analysis it was felt that this could be accommodated within the receiving landscape due to the coherent design created through careful turbine placement.
- 6.338 Consideration was also given to the proposed development in this location, its relationship with other operational and consented wind farms in the locality, and the capacity of the receiving landscape to accommodate further wind farm development. The proposed development follows many of the turbine composition and spacing patterns implemented at recently consented or applied for developments in the surrounding area, such as Sallachy 2nd Submission and Shinness, where, for instance, a similarly promoted linear design with turbines of a comparable scaled have been proposed. These changes reflect technological advancements, and the potential higher energy yields that can arise from higher – and more efficient – modern turbines, than was previously the case when many of the currently operational wind farms were under consideration, i.e., Creag Riabhach.
- 6.339 Based on general good practice design principles (as set out in NatureScot guidelines) and an analysis of Site-specific opportunities and constraints, the wind farm layout has evolved to take into consideration a number of landscape and visual constraints whilst

maintaining an optimal development and seeking to maximise renewable generation and carbon reduction, resulting in the 15no. proposed turbine layout with blade tip heights up to 250m which has been taken forward to the EIA phase.

- 6.340 A design rationale has been adopted to avoid inconsistent turbine spacing, large gaps, turbine outliers, or excessive overlapping of turbines, to minimise visual confusion, minimise the prospect for visual effects, and ensure a balanced/ compact array from key views in the local landscape, with the layout amended during the design iteration process to minimise any potential effects from Assynt-Coigach NSA or from nearby settlements and residential properties.
- 6.341 The above principles have been applied as a number of iterations to the design were made. Taking all other engineering and environmental constraints into account, the final layout of the turbines was specifically designed to achieve a balanced array of turbines when viewed from the surrounding landscape, whilst maximising the overall energy yield.
- 6.342 In considering the layout of other structures and ancillary features of the proposed development, the position of the substation, construction compound, battery storage compound, and borrow pits are located so as to minimise their influence on the surrounding area.
- 6.343 The turbines themselves would be painted an off-white colour with a low reflectivity semi-matt white or light grey (or similar as agreed with consultees). Such a finish is widely regarded to be the least intrusive in the landscape when seen against the sky in a host of weather conditions typically experienced within the UK.
- 6.344 Whilst recognising that areas of commercial coniferous forestry plantation are to be removed during the construction phase, with areas replanted that may take up to seven years of growing to reach 2m, there are other areas of forestry that would be retained on-site, including in proximity to the A838. The forestry replanting design (see **Figure 14.3**) has been development in-part to maximise the screening/ filtering benefits of the forestry across the lifetime of the proposed development, providing a regular occurrence in views, whilst minimising potential visibility of ground-level components of the proposed development, such as the substation building and access tracks, particularly from local receptors. The retained areas of forestry would also minimise the potential for clear, unobstructed views of the proposed turbines from the properties at Overscaig, as well as from sections of the A838 as the road routes past the extents of the Site.
- 6.345 Mitigation of visible aviation lighting has been designed into the proposed development by adopting a cardinal lighting design where only six of the outermost turbines are lit (T1, T4, T6, T9, T12, and T15), with the design agreed with the CAA. Mitigation of visible turbine lighting has been embedded into the lighting design. Visibility sensors would be installed on relevant turbines to measure the prevailing atmospheric conditions and visibility range. Should atmospheric conditions mean that visibility from the turbines within the Site is greater than 5km from the proposed development, CAA policy permits lights to operate in a lower intensity mode, being a minimum of 10% of their capable illumination. Therefore, the 2000cd steady state lights would operate at 200cd. If visibility is however restricted to 5km or less, the lights would operate at 2000cd.
- 6.346 Additionally, the inherent directional intensity of 2000cd lights can be used to reduce vertical downwards lighting impacts at elevations less than -1° degree vertical angle from the horizontal plane from the aviation light. By ensuring the lights installed comply with the ICAO recommendations, it is possible to attenuate the vertical downwards light to a level that reduces the visual impact from receptors at ground levels below the lights.

Implementing the ICAO recommendations, at -1 degrees the aviation lights should only be 1125cd and at -10 degrees should only be 75cd, when visibility is greater than 5km.

- 6.347 Further explanation of this is set out in **Technical Appendix 6.8: Assessment of Night-time Lighting - Assessment Criteria and Methodology (Volume 4 of this EIA Report)**.
- 6.348 These measures are proposed as embedded mitigation. They are likely to reduce the magnitude of visual effects particularly for distant receptors; however, this feature would not remove visibility of aviation lighting completely for any nearby receptors.
- 6.349 In the long term, when the proposed development is decommissioned, the turbines would be removed from the Site, and the hardstanding would be restored in accordance with a restoration plan to be approved by the relevant consultees.

Assessment of Residual Effects

- 6.350 In general terms, best practice for EIA, requires that the significance of potential effects be assessed, with mitigation proposals identified, and the residual effect (with mitigation in place) then re-assessed to demonstrate the effectiveness of the mitigation proposed.
- 6.351 In the case of LVIA for wind farms this presents two interrelated problems:
- Potential effects cannot be meaningfully assessed in the absence of an assumed layout; and
 - Landscape and visual mitigation is principally focussed on the refinement of the Site layout ('mitigation by design').
- 6.352 The residual landscape and visual effects have been assessed as a result of the primary mitigation embedded within the design of the proposed development, relating to avoiding and minimising landscape and visual effects during the evolution of the proposed development layout. Therefore, the residual landscape and visual effects are considered the same as those assessed in the main part of the LVIA.

Assessment of Cumulative Effects

- 6.353 For the cumulative assessment, consideration was initially given to a 60km radius from the Site, as recommended by NatureScot best practice guidance. After undertaken initial desktop analysis of preliminary ZTVs and wirelines from key design viewpoints, a 35km cumulative study area was considered sufficient to appraise potential cumulative effects attributable to the proposed development, and this was put forward for consideration in the EIA scoping report.
- 6.354 Following the EIA scoping exercise, the initial LVIA study area and cumulative study area was increased to 45km in response to the feedback from consultees. The initial cumulative study area for the LVIA is 45km radius from the turbines in all directions, as agreed with THC. The extent of this study area, and the other wind farms located within 45km of the Site, is illustrated in **Figure 6.29**.
- 6.355 All other wind energy developments that are operational, under construction, consented, subject to a valid full planning application, or a valid scoping request within 45km of the proposed development have been identified and reviewed as part of the cumulative baseline (see **Figure 6.29**). It is acknowledged that this list is constantly evolving and therefore a date of 09 May 2025 was used as an effective 'cut-off' date after which no further research was undertaken on the evolving status of wind energy development in

the study area, and the cumulative Landscape and visual Assessment (CLVIA) reflects the status of each wind farm at the time of this date.

- 6.356 When reviewing the list, analysis was undertaken to refine this list in order to ensure a proportionate approach focused on potentially significant effects, as advocated by NatureScot guidelines 'Assessing the Cumulative Impact of Onshore Wind Energy Developments' (2012) which states (page 8, paragraph 33) that:

"Assessments should focus on the most significant cumulative effects and conclude with a clear assessment of those which are likely to influence decision making."

- 6.357 In this regard, and following initial site work informed by analysis of preliminary ZTVs and wirelines from the agreed viewpoint locations, it was determined that any significant cumulative landscape and visual effects are likely to occur within a much narrower radius from the Site; therefore, the level of assessment work incrementally decreases with distance from the Site, with the greatest focus of assessment being within broadly 20km of the Site.
- 6.358 The intention is that the detail of the cumulative study remains proportional to the likely significance of effects and therefore focused on those developments which have the greatest potential to give rise to significant cumulative effects with the proposed development. It was also deemed appropriate to scope out any turbines under 50m to tip, or any turbines between 50m and 80m to tip which lie over 10km from the nearest proposed turbine. Developments that are at the scoping or pre-application stage are considered separately due to the uncertainty that these developments will come forward and the lack of adequate information about project details. This is in accordance with the approach advocated in GLVIA3.
- 6.359 At the time of preparing this LVIA, there were 11 no. other wind farms within the detailed 20km cumulative study area which were either operational, under construction, in-planning or at scoping/ pre-application stage, which are set out in the table below.

Table 6.12 Other Wind Farms within 20km of the Proposed Development

Site	Blade Tip Height (m)	Number of Turbines	Approximate Distance and Direction
Operational / Under Construction			
Creag Riabhach	125	22	7km north-east
Achany	100	19	16km south-east
Rosehall	90	19	17km south-east

Consented			
Sallachy – 2 nd Submission	149.9	9	3km south-west
Creag Riabhach Extension	149.9	3	8km north-east
Achany Extension	149.9	18	10.5km south
Strath Tirry	135	4	13km south-east
Chleansaid	200	16	14km south-east
In-Planning			
Shinness	200	16	5km south-east
Allt An Tuir	200	9	17km south
Scoping/ Pre-Application			
Invercassley	230	22	15km south south-west

- 6.360 For the avoidance of doubt, and to reiterate the methodology adopted in **Appendix 6.1: Landscape and Visual Impact Assessment Criteria**, the baseline against which the solus effects of the proposed development has been assessed includes all operational wind farms. An assessment of the proposed development with consideration of other operational wind farms has already therefore been presented in the main section of this LVIA.
- 6.361 The primary purpose of the cumulative impact assessment is therefore to consider the additional effects that might arise as a result of the proposed development if the other consented, under construction, in-planning (awaiting determination) and scoping/ pre-application developments were also operational. In addition, this cumulative assessment also includes a further consideration of the overall totality of the effect, when the proposed development is considered alongside the other operational, consented, or in-planning developments across the 20km detailed study area.
- 6.362 The baseline in the cumulative impact assessment is therefore extended to consider other developments that are not yet present in the landscape but are at various stages in the planning process. Three scenarios are generally considered which reflect the different degrees of certainty that these developments will be constructed:

- Scenario 1 assumes that other consented (but as yet unbuilt) wind farms are operational.
- Scenario 2 extends this further to assume that all developments in-planning are also operational. In reality, it is possible that other developments that are in-planning may not be approved and constructed but this scenario assumes that all in-planning developments are operational; and
- Scenario 3 extends this even further and assumes that all scoping/ pre-application developments are also operational, in addition to all consented and in-planning developments. Scoping/ pre-application developments may not even be constructed or even form part of a future planning application; however, this scenario considers the 'worst case' situation.

Cumulative ZTVs and Wireframes

- 6.363 Cumulative ZTVs (CZTVs) have been produced to illustrate the theoretical visibility of various other wind farms and combinations of wind farms with the proposed development.
- 6.364 It should be reiterated that ZTVs imply a much greater geographical extent of influence on the landscape and views of it than would actually be the case. It therefore follows that the cumulative ZTVs also exaggerate the actual impacts of the turbines on landscape character and visual amenity as they do not take account of vegetation or buildings in the landscape, which may restrict the nature and extent of views.
- 6.365 Cumulative ZTVs have been produced for the following combinations of existing, consented, and other wind farm sites in planning:
- Operational: Beinn nan Oighrean, Beinn Tharsuinn*, Bettyhill Phase 1, Coire na Cloiche, Gordonbush, Gordonbush Extension, Kilbraur, Kilbraur Extension, Lairg, and Strathlyon South Wind Farms (see **Figure 6.31: Cumulative ZTV within 45km with Operational and Constructed Wind Farms**).
 - Operational: Creag Riabhach, Rosehall, and Achany Wind Farms (see **Figure 6.34: Cumulative ZTV within 20km with Operational and Constructed Wind Farms**).
 - Consented: Bettyhill Phase 2, Garvary, Lairg 2 Resubmission, Meall Buidhe, and Strath Oykel Wind Farms (see **Figure 6.32: Cumulative ZTV within 45km with Consented Wind Farms**).
 - Consented: Achany Extension, Chleainsaid, Creag Riabhach Extension, Sallachy 2nd Submission, and Strath Tirry Wind Farms (see **Figure 6.35: Cumulative ZTV within 20km with Consented Wind Farms**).
 - In-Planning: Acheilidh, and Balblair Wind Farms (see **Figure 6.33: Cumulative ZTV within 45km with In Planning Wind Farms**).
 - In-Planning: Shinness and Allt an Tuir Wind Farms (see **Figure 6.36: Cumulative ZTV within 20km with In Planning Wind Farms**).

* Beinn Tharsuinn is currently operational but is soon to be decommissioned. Its operational status has been retained for the purposes of this assessment.

- 6.366 Whilst no cumulative ZTVs have been produced to show the combinations of theoretical visibility for scoping/ pre-application wind farms due to the increased uncertainty regarding a site design, the turbine layout information made publicly available has been used, so a version of all scoping/ pre-application developments within the 45km study area

can be incorporated into the cumulative wirelines for each viewpoint to provide an indication of location, scale, and intervisibility with the proposed development and other wind farms in the study area.

Cumulative Effects on Landscape Character

- 6.367 It is acknowledged that wherever more than one wind farm is visible at any given location in the landscape, there will be a greater overall or cumulative effect on landscape character than if just one wind farm was visible in the landscape.
- 6.368 It is also noted however that in any given landscape where turbines are already present, the additional effect on landscape character of introducing further turbines may not be as significant as the initial introduction of turbines. Furthermore, in general, the greater the number of turbines in the baseline landscape the less significant the addition of further turbines may be in landscape character terms as the landscape will be more heavily characterised by turbines in the baseline situation.
- 6.369 It has been assessed in the assessment of the solus effects of the proposed development set out earlier in this chapter that there would be some limited significant effects on landscape character as a result of the proposed development. The purpose of this section of the cumulative assessment is therefore to identify whether there would be any change to the assessments of significance previously set out in relation to the proposed development, once the other wind turbines which are not already operational, are considered to form part of the baseline landscape.
- 6.370 Generally speaking, such additional cumulative effects would arise when the addition of the proposed development to the baseline results in an increase in effects, when viewed in combination with the other wind turbines forming part of the baseline landscape.

Cumulative Scenario One – Other Consented Developments are also considered to be Operational

- 6.371 In this cumulative scenario (where other consented developments are also considered to be operational) there would be five additional developments: Creag Riabhach Extension, Chleansaid, Strath Tirry, Achany Extension, and Sallachy 2nd Submission. Each of the developments are located to the north-east, south-east, south, and south-west of the Site at varying distances between 3km and 14km.
- 6.372 Sallachy 2nd Submission is the closest of the other consented developments, located around 3km to the south-west of the Site, in the neighbouring landscape character typology (LCT 135: Rounded Hills - Caithness & Sutherland). The Chleansaid and Strath Tirry developments lie over 10km to the south-east of the Site, between the Creag Riabhach Extension and Achany Extension developments that lie approximately 8km north-east and approximately 10.5km south of the proposed development, respectively.
- 6.373 The CZTV prepared for the consented developments within 20km of the proposed development (see **Figure 6.35**) illustrates the potential for visibility of the proposed development with one or other of the developments from much of the landscape in all directions within 10km of the proposed development before fragmenting to more elevated areas to the north, east, and west of the Site. The combined visibility pattern remains relatively consistent to the south and south-east of the study area. The cumulative wirelines included with the visualisations (see **Volumes 3 and 5**) illustrate the relationship between the sites and show that in reality much of the theoretical visibility shown on the CZTV would be no more than blade tips, with greater visibility seen in viewpoints from more

elevated locations; albeit often at increased distances from the viewer (e.g. Viewpoints 6, 7, 10, 12, 13, 15, and A-D).

- 6.374 When reviewing the CZTV to ascertain the additional theoretical visibility the proposed development would add across the extents of the 20km study area, there is minimal new areas of land to consider, with the areas illustrating where the proposed development would theoretically be the only wind farm visible, largely concentrated at the edges of areas displaying combined visibility of the proposed development and one or other consented development. Conversely, **Figure 6.35** illustrates that there would be several large areas across the 20km study area where there is no theoretical prospect to view the proposed development, but where there would be visibility of one or other consented developments.
- 6.375 On this basis, it would appear that the introduction of the consented developments into the baseline landscape would extend the existing influence of wind farms present across the extents of the 20km study area.
- 6.376 Whilst the addition of the proposed development would extend the influence of wind turbines in LCT 134: Sweeping Moorland and Flows (Strath Fiag/Tirry unit) to the north, north-east, east, south-east, and upon LCT 135: Rounded Hills Caithness & Sutherland (Loch Shin Rounded Hills unit) to the south-east, south, south-west, and west; and across LCT 135: Rounded Hills Caithness & Sutherland (Loch Fiag Rounded Hills unit) in the north-west, north and north-east, the presence of the consented developments means the proposed development would not result in any change to the solus effects identified in the main assessment, nor would it introduce a cumulative significant effect.
- 6.377 Indeed, the future baseline conditions brought about the consented developments would have the potential to reduce the solus effects attributable to the proposed development.

Cumulative Scenario Two – Other In-Planning Developments are also considered to be Operational

- 6.378 In this cumulative scenario (where other developments in planning are also considered to be consented and operational) there would be two further additional developments to consider: Shinness, which would be located around 5km to the south-east, and Allt An Tuir, which would be located around 17km to the south of the proposed development.
- 6.379 The CZTV prepared for the in-planning developments within 20km of the proposed development (see **Figures 6.36**) illustrate the potential for visibility of the proposed development with Shinness or Allt An Tuir from large parts of the landscape.
- 6.380 In the context of the existing wind energy development at Achany and Rosehall, the Allt An Tuir development is judged to have minimal potential to result in any cumulative effects on landscape character with the proposed development, beyond those already set out in the main assessment.
- 6.381 In the case of the Shinness development, this has the potential to be seen simultaneously with the proposed development in Viewpoints 3, 6-16, and A-D. Indeed, in several viewpoints, including Viewpoints 8, 9, and 11, the Shinness development would be seen in the very foreground of the view. In these instances, the presence of the Shinness development would serve to reduce the potential for landscape effects from the proposed development, as it would exert a greater influence on the character of the landscape within its vicinity than the more distant proposed development.

- 6.382 Similar to the proposed development, the Shinness development would be located in LCT 134: Sweeping Moorland and Flows, increasing the presence of wind energy as a characteristic of this LCT. Whilst the presence of Shinness would serve to reduce the potential impact of the proposed development on the character of the 'host' LCT unit, there would however be some additional localised significant cumulative effects that would likely arise to the landscape character of LCT 134: Sweeping Moorland and Flows, and the neighbouring LCT 135: Rounded Hills - Caithness & Sutherland owing to Shinness and the proposed development appearing as discrete wind farms and adding turbines in a different – and additional – landscape from the existing baseline and consented developments.
- 6.383 When considering that the consented developments are predicted to lower the effects predicted when assessing the effects of the proposed development against the current baseline conditions, the resulting change – and predicted rise in effects – brought about by the introduction of the proposed development and Shinness is ultimately predicted to be no different to the judgements presented in the main assessment.

Totality of the Combined Effect of All Developments, including the other Operational Developments

- 6.384 Consideration has also been given to the overall totality of the effect, when the proposed development is considered alongside the other operational, consented, and in-planning developments found within the study area. Of most relevance to this, is a consideration of the overall impact on the LCTs where a significant effect was identified in the main assessment, namely LCT 134: Sweeping Moorland and Flows (Strath Fiag/Tirry unit) and LCT 135: Rounded Hills Caithness & Sutherland (Loch Shin Rounded Hills unit).
- 6.385 The closest operational developments to the proposed development are the Creag Riabhach development that comprises 22no. turbines and lies approximately 7.5km to the north-east of the Site, and the Achany and Rosehall developments that comprise 19no. turbines each, and that both lie approximately 16km-17km south-east of the proposed development. Other operational developments are located beyond 20km, to the north-east, south-east, and south of the proposed development.
- 6.386 The CZTV prepared for the operational developments (see **Figures 6.31 and 6.34**) illustrates the potential for visibility of the proposed development with one or other of the developments from much of the landscape, in particular from higher ground.
- 6.387 Overall, collectively the operational developments serve to result in wind energy being seen as a notable feature in the landscape of the wider study area to the north-east, south-east, and south of the Site. In particular, within LCT 134: Sweeping Moorland and Flows, and the neighbouring LCT 135: Rounded Hills - Caithness & Sutherland, where a significant effect on landscape character would arise across a notable area from the existing developments. The addition of the proposed development would serve to reinforce this pattern of wind energy within LCT: 134 – Sweeping Moorland and Flows (Strath Fiag/Tirry unit) and LCT 135: Rounded Hills Caithness & Sutherland (Loch Shin Rounded Hills unit), albeit extending the significant effects into a separate area further to the north and west.
- 6.388 It is acknowledged that the combined overall effect on the character of LCT: 134 – Sweeping Moorland and Flows (Strath Fiag/Tirry unit) and LCT 135: Rounded Hills Caithness & Sutherland (Loch Shin Rounded Hills unit), would be notable, were the proposed development and the other consented and in-planning developments constructed, reinforcing an existing documented characteristic feature. There would remain a considerable spacing between the proposed development and the operational Achany

and Rosehall developments, the consented Achany Extension, and the in-planning Allt An Tuir.

- 6.389 Whilst the physical separation between the proposed development and the other developments, namely the existing Creag Riabhach and its consented extension, the consented Chleansaigh, Strath Tirry, and Sallachy 2nd Submission, and the in-planning Shinness, would be reduced if all developments were constructed, it would not be the case that wind energy would become the single dominant characteristic of LCT: 134 – Sweeping Moorland and Flows (Strath Fiag/Tirry unit) or LCT 135: Rounded Hills Caithness & Sutherland (Loch Shin Rounded Hills unit), so as to prevent an understanding and appreciation of the character of the LCT.

Cumulative Effects on Views and Visual Amenity

- 6.390 As with cumulative landscape character effects, it is acknowledged that the addition of the proposed development to the baseline has the potential to result in an increase in effects, when viewed in combination with other wind turbines forming part of the visual baseline.
- 6.391 It is also noted however that in any given view where turbines are already present, the additional effect on visual amenity of introducing further turbines may not have as great an effect as the initial introduction of turbines. Furthermore, in general the greater the number of turbines in the baseline view, the less significant the addition of further turbines may be. It is also recognised however that a slight additional effect on top of an existing effect, which at present is not quite significant, could in theory tip the balance such that the overall effect is deemed to be significant.
- 6.392 Again, generally speaking, such additional cumulative effects would arise where a visual receptor would now lie between a cumulative wind farm in one direction and the proposed development in a different direction, such that the visibility of turbines as a result of the addition of the proposed development would become notable in multiple, usually directly opposite, directions.

Cumulative 'in combination' Visual Effects

- 6.393 An 'in combination' cumulative visual effect is the term used to refer to the situation where a viewer is able to see one or more further wind farms, in addition to the proposed development, whilst standing in the one location. These effects are either 'simultaneous,' where the viewer can see the additional turbines in the same angle of view, or 'successive,' where the viewer can see the additional turbines in a different angle of view by turning their head.
- 6.394 As set out in the main assessment, there are many locations where other existing wind turbines are seen in views from the landscape in and around the proposed development. In particular, the more elevated viewpoints such as Viewpoints 6, 7, 10, 12-16, and A-D have views of several existing developments at various more distant locations across the extent of the Caithness & Sutherland landscape, particularly from more hilly or mountainous areas.

Cumulative Scenario One – Other Consented Developments are also considered to be Operational

- 6.395 In this cumulative scenario (where other consented developments are also considered to be operational) there would be five additional developments: Creag Riabhach Extension, Chleansaid, Strath Tirry, Achany Extension, and Sallachy 2nd Submission. Each of the developments are located to the north-east, south-east, south, and south-west of the Site at varying distances between 3km and 14km.
- 6.396 The CZTV prepared for the consented developments within 20km of the proposed development (see **Figure 6.35**) illustrates the potential for visibility of the proposed development with one or other of the developments from much of the landscape in all directions within 10km of the proposed development before fragmenting to more elevated areas to the north, east, and west of the Site. The combined visibility pattern remains relatively consistent to the south and south-east of the study area. The cumulative wirelines included with the visualisations (see **EIAR Volumes 3 and 5**) illustrate the relationship between the sites and show that in reality much of the theoretical visibility shown on the CZTV would be no more than blade tips, with greater visibility seen in viewpoints from more elevated locations; albeit often at increased distances from the viewer (e.g. Viewpoints 6, 7, 10, 12, 13, 15, and A-D).
- 6.397 When reviewing the CZTV to ascertain the additional theoretical visibility the proposed development would add across the extents of the 20km study area, there is minimal new areas of land to consider, with the areas illustrating where the proposed development would theoretically be the only wind farm visible, largely concentrated at the edges of areas displaying combined visibility of the proposed development and one or other consented development. Conversely, **Figure 6.35** illustrates that there would be several large areas across the 20km study area where there is no theoretical prospect to view the proposed development, but where there would be visibility of one or other consented developments.
- 6.398 On this basis, it would appear that the introduction of the consented developments into the baseline landscape would extend the existing influence of wind farms present in views from across the extents of the 20km study area.
- 6.399 Whilst the addition of the proposed development would extend the influence of wind turbines in views from certain locations, the presence of the consented developments means the proposed development would not result in any change to the solus effects identified in the main assessment, nor would it introduce a cumulative significant effect.
- 6.400 Indeed, the future baseline conditions brought about the consented developments would have the potential to reduce the solus effects attributed to the proposed development either by:
- Introducing wind turbines into views void of visibility of any existing developments.
 - Owing to the proximity of the consented sites to the existing operational wind energy development which has already been considered in the main assessment, i.e. the extension developments at Creag Riabhach and Achany; or
 - Owing to one or other consented development appearing in the foreground of the view, serving to reduce the potential for visual effects as a result of the proposed development, as shown in Viewpoints 6, and 12.

- 6.401 Consequently, the predicted cumulative visual effects, are judged to be no greater than those identified in the main assessment during daylight and darkness hours.

Cumulative Scenario Two – Other In-Planning Developments are also considered to be Operational

- 6.402 In this cumulative scenario (where other developments in planning are also considered to be consented and operational) there would be two further additional developments to consider: Shinness, which would be located around 5km to the south-east, and Allt An Tuir, which would be located around 17km to the south of the proposed development.
- 6.403 The cumulative ZTV prepared for the in-planning developments within 20km of the proposed development (see **Figures 6.36**) illustrate the potential for visibility of the proposed development with Shinness or Allt An Tuir from large parts of the landscape.
- 6.404 In the context of the existing wind energy development at Achany and Rosehall, the Allt An Tuir development is judged to have minimal potential to result in any cumulative effects on views when witnessed with the proposed development, beyond those already set out in the main assessment.
- 6.405 In the case of the Shinness development, this has the potential to be seen simultaneously with the proposed development in **Viewpoints 3, 6-16, and A-D**. Indeed, in several viewpoints, including **Viewpoints 8, 9, and 11**, the Shinness development would be seen in the very foreground of the view.
- 6.406 The presence of the Shinness development would serve to reduce the potential for visual effects from the proposed development by its addition serving to further establish wind energy as a visual component in the wider landscape. Whilst true, it is recognised that Shinness and the proposed development would often appear in views as discrete wind farms, adding further turbines in a different part of the landscape from the existing baseline and consented developments.
- 6.407 When considering that the consented developments are predicted to lower the effects predicted when assessing the effects of the proposed development against the current baseline conditions, the resulting change – and predicted rise in effects - brought about by the introduction of the proposed development and Shinness is ultimately predicted to be no different to the judgements presented in the main assessment across daylight and darkness hours.

Cumulative 'Sequential' Effects

- 6.408 A 'sequential' cumulative visual effect is the term used to refer to the situation where a viewer is able to see one or more further wind farms in addition to the proposed development, whilst travelling along a linear route. This could be either on foot, whilst walking on a footpath, or by bicycle or car along the public highway. The main assessment focussed on the following routes which were identified as having the greatest potential to experience significant effects as a result of the proposed development and these were also used as the basis for the cumulative assessment:
- Core Path SU16.03 Ord Hill.
 - Core Path SU16.10 Loch Craggie.
 - Core Path SU16.05 Loch Shin Hide.
 - John O'Groats Cycle Route.

- A838.
 - A836.
 - A839.
 - Moray Firth Tourist Route.
- 6.409 The Core Paths listed above that were considered in the main assessment lie to the north-east, south-east, south, west, and north-west of the Site, at varying distances exceeding 15km from the proposed development. Along various points of the Core Paths there are views of existing turbines. The main assessment identified no more than **moderate/ minor**, not significant effects on the above Core Paths. There would be no further significant cumulative effects in addition to those identified for the proposed development in its own right.
- 6.410 The John O'Groats Cycle Route is a moderately long-distance recreational route. No sections of the route, which utilises the A836, lie in proximity of the proposed development, with the closest point of the route lying over 5km east of the nearest proposed turbine.
- 6.411 Along various points of its length there are views of existing turbines, with both the consented and in-planning developments also likely to be visible from the route to varying degrees as it passes through the eastern part of the 20km study area. The main assessment identified a **major/ moderate** and significant effect on the route during daylight hours from an approximately 5km stretch as the route passes near Crask Inn, with proposed turbines serving to reinforce the visibility of wind energy along the route as a whole. There would be no further significant cumulative effects in addition to those identified for the proposed development in its own right. For the remaining sections of the route, effects were judged as being no greater than **moderate/ minor** and not significant. Given the route utilises the A836, the results of this assessment for the John O'Groats Cycle Route are considered to be consistent with those that would be identified for the A836. No further assessment is therefore provided for A836.
- 6.412 The A838 is a long road that extends from Lairg to Tongue. The A838 extends from the junction with the A836 to the south-east of the Site, where it passes along the north-western edge of Loch Shin, up to the southern edge of the Site. Beyond the Site, the road heads to the north-west passing Loch a Ghriama, Loch Merkland and Loch More. The A838 extends up to Durness and then follows the northern coast where it terminates at Tongue.
- 6.413 Sections of the A838 lie in proximity to the proposed development, with the closest point of the road lying approximately 850m to the south at its closest point. Across the section of the route that extends between Lairg and the Site, there is periodic spells of visibility of existing wind energy; with visibility becoming more limited beyond approximately 4km to the west of the Site, which is also true when reviewing the visibility patterns attributable to the proposed development. The main assessment identified **moderate** significant effects during daylight and darkness hours across sections of the A838 south-east of the nearest proposed turbines up to approximately 5km, with further **moderate** significant effects predicted during daylight hours only between 5km and 8km to the south-east, with the proposed turbines serving to reinforce the visibility of wind energy along the A838 between the Site and Lairg. As a result, there would be no further significant cumulative effects in addition to those identified for the proposed development in its own right.
- 6.414 The A839 is a moderately short transport road that extends between Loch Fleet and Rosehall in southern Sutherland. The A839 passes through Lairg where it is located approximately 19km to the south-east of the proposed development at its closest point. The road provides a route from Rosehall to the A9 near Golspie where it follows Strath Fleet. Along various points of its length there are views of existing turbines. The main assessment

identified a **moderate/ minor**, not-significant effect. There is not considered to be any further significant cumulative effects in addition to those identified for the proposed development in its own right.

- 6.415 The Moray Firth Tourist Route also passes through the study area, approximately 19km to the south-east at its closest point. The route follows the A839 east of Lairg, as well as the A836 to the south of Lairg. Along various points of its length there are views of existing turbines. The main assessment identified a **moderate/ minor** not significant effect on the route. The potential for the effects of the proposed development to result in significant cumulative effects once the other consented and in-planning developments are also included has been considered and no further significant cumulative effects have been identified.

Totality of the Combined Effects of all Developments

- 6.416 Consideration has also been given to the overall totality of the cumulative visual effect when the proposed development is considered alongside the other operational, consented, and in-planning developments.
- 6.417 The closest operational developments to the proposed development are the Creag Riabhach development that comprises 22no. turbines and lies approximately 7.5km to the north-east of the Site, and the Achany and Rosehall developments that comprise 19no. turbines each, and that both lie approximately 16km-17km south-east of the proposed development. Other operational developments are located beyond 20km, to the north-east, south-east, and south of the proposed development.
- 6.418 The CZTV prepared for the operational developments (see **Figures 6.31 and 6.34**) illustrates the potential for visibility of the proposed development with one or other of the developments from much of the landscape, in particular from higher ground.
- 6.419 Overall, collectively the operational developments serve to result in wind energy being seen as a notable feature in many views in the landscape of the wider study area to the north-east, south-east, and south of the Site. The addition of the proposed development would serve to reinforce this pattern of wind energy, albeit extending the significant effects into a separate area further to the north and west.

Scoping/ Pre-Application Developments

- 6.420 As shown on **Figure 6.29**, there is only one scoping/ pre-application stage development located within 20km of the Site: Invercassley Wind Farm, which lies approximately 15km to the south south-west of the proposed development. As noted previously, due to the relative uncertainty and detail about scoping/ pre-application stage developments, the projects have not been included in the main cumulative assessment. This is in accordance with the approach advocated in GLVIA3. It is acknowledged however that were the development to become operational, then the overall totality of the landscape character and visual effects of wind turbines in the study area in the vicinity of the two sites would increase.
- 6.421 The visualisations prepared in support of the LVIA from the agreed viewpoint locations illustrate the limited potential for visibility of the proposed development with the Invercassley development from much of the landscape, with any simultaneous views primarily to the south and west of the Site and largely from more elevated areas. In particular, the Invercassley development would be seen simultaneously with the proposed development in **Viewpoints 2, 5, 7, 13, A-D**.

- 6.422 In **Viewpoint D**, the Invercassley would be seen in the middle-distance of the view. In that instance, the presence of the Invercassley development would serve to reduce the potential for visual effects from the proposed development; whilst acknowledging that the Coille Beith development would be a more prominent development in the foreground of the view than either the proposed development or Invercassley.
- 6.423 The Invercassley development would be located across LCT 135: Rounded Hills -Caithness & Sutherland, serving to establish the presence of wind energy as a characteristic of this LCT which would reduce the potential impact of the proposed development on the character of this area.
- 6.424 For both landscape character and visual receptors in the landscape between the two sites there is the potential for an increase in effects as a result of the proposed development being seen in views in the opposite direction to the Invercassley development. This would likely relate primarily to intervening landscapes, and recreational walkers on elevated areas of land; whilst acknowledging that potential successive views may be possible from the A836, the A838, the John O'Groats Cycle Route, and those residential properties which lie between the two developments.
- 6.425 Whilst the combination of the proposed development and the Invercassley development would add further turbines, increasing the influence of wind farms in certain landscapes and views, the majority of time there would be no or minimal prospect for intervisibility between the two sites owing to screening provided by intervening landform and tree cover, and/ or attenuation by distance.
- 6.426 When considering potential effects during darkness hours, the assumption is that one or both developments would be operating on a proposed aviation lighting mitigation design when viewed owing to distance; although, this would be dependent on any application coming forward for Invercassley and their proposed aviation lighting mitigation design.
- 6.427 When considering all the above factors, it is judged that there would not be any change to the results presented in the assessment during daylight or darkness hours when assessing the effects of the proposed development against the current baseline conditions.

Summary of Cumulative Effects

- 6.428 It is acknowledged that wherever more than one wind farm is visible at any given location in the landscape, there will be a greater overall or cumulative effect on landscape character and visual amenity than if just one wind farm was visible in the landscape. Likewise, it is acknowledged that the more wind turbines that are constructed in any given landscape, the greater the magnitude of overall (or combined) change to the landscape character or views.
- 6.429 At the time of preparing this LVIA, there were ten other wind farms within the detailed 20km cumulative study area which were either operational, under construction, or in-planning, plus the Invercassley development, which is at scoping/ pre-application stage.
- 6.430 Of these, the only development which the proposed development would have the potential to give rise to significant cumulative effects in combination with is the Shinness development. The cumulative wirelines included with the visualisations illustrate the relationship between the sites and show that in many views, both developments would be seen simultaneously.
- 6.431 Were Shinness included in the baseline landscape, alongside the proposed development, there would be the potential for additional localised significant cumulative effects on the

landscape character of LCT 134: Sweeping Moorland and Flows (Strath Fiag/Tirry unit) and LCT 135: Rounded Hills Caithness & Sutherland (Loch Shin Rounded Hills unit). The Shinness turbines would also reinforce the other localised significant effects identified on landscape character and on visual receptors in close proximity to the Site.

- 6.432 In saying that, when considering that the presence of the consented developments is judged to lower the effects predicted when assessing the effects of the proposed development against the current baseline conditions, the resulting change – and subsequent predicted rise in effects - brought about by the introduction of the proposed development and Shinness is ultimately predicted to be no different to the judgements presented in the main assessment across daylight and darkness hours.
- 6.433 Consideration has also been given to the overall totality of the cumulative landscape and visual effects when the proposed development is considered alongside the other operational, consented, and in-planning developments. Collectively, the various operational, consented, and in-planning developments would serve to result in wind energy being seen as a notable feature in many views in the landscape of the wider study area. The addition of the proposed development would serve to reinforce this pattern, particularly in combination with the proposed Shinness development, albeit extending the significant visual and character effects into a separate area further to the north and west within the landscape.

Summary

- 6.434 This chapter presents the findings of the Landscape and Visual Impact Assessment (LVIA) and identifies the likely significant effects arising from the proposed development on landscape character and visual amenity. It has been informed by field visits and by consultation undertaken with statutory consultees including The Highland Council and NatureScot.

Landscape and Visual Baseline Summary

- 6.435 The existing landscape and visual baseline has been documented, and the assessment has been supported by figures (see **Volume 2**) as well as visualisations produced to NatureScot (see **Volume 3**) and The Highland Council (see **Volume 5**) visualisation standards that show representative views from locations consulted on at scoping that illustrate existing and proposed views during daylight hours from all 20no. agreed LVIA viewpoints as well as viewing during darkness hours from a select number of viewpoint locations (presented in **Volumes 3 and 5**).
- 6.436 The Site forms part of an active commercial coniferous forestry plantation, dominated by a mixture of sitka spruce and lodgepole pine. The Site lies to the north of the A838 and Loch Shin, approximately 18.5km to the north-west of Lairg.
- 6.437 The closest settlement to the proposed wind farm is Overscaig, located approximately 3.25km to the south-west of the Site. The nearest main highway is the A838 which runs adjacent to the southern boundary of the Site.
- 6.438 There are no national landscape designations covering the Site. The nearest National Scenic Area (NSA) is Assynt-Coigach, which lies approximately 9.5km to the west. The proposed development is also not located within a locally designated landscape. The nearest locally designated landscape is the Ben Klibreck and Loch Choire Local Landscape Area (LLA) that lies approximately 9.5km to the east-northeast of the Site. A number of other NSAs and LLAs lie within 45km of the Site. The Site lies near Wild Land Area (WLA) 37. Foinaven - Ben Hee.

- 6.439 The proposed turbines and associated infrastructure are located within NatureScot Landscape Character Type (LCT) 134: Sweeping Moorland and Flows (*Strath Fiag/ Tirry unit*), with the southern boundary of the Site located adjacent to NatureScot LCT 135: Rounded Hills – Caithness & Sutherland.

Embedded Mitigation Summary

- 6.440 The primary mitigation adopted to reduce potential landscape and visual effects is embedded within the design.
- 6.441 The design rationale adopted sought to avoid inconsistent turbine spacing, large gaps, outliers or excessive overlapping of turbines, to reduce visual effects and ensure a balanced/ compact array from key views.
- 6.442 The number of turbines has been reduced from 22 turbines at 230m to 15 turbines at 250m for the final layout. The deletion of turbines resulted in a simple cohesive layout with reduced stacking. The increase in tip height was driven from analysis of the Zone of Theoretical Visibility which shows that the increase from 230m to 250m translated to a 0.5% increase in visibility across study area. It is considered that this can be accommodated within the receiving landscape due to the coherent design created through careful turbine placement. This increase in turbine tip height to 250m also resulted in an increase in energy yield for the proposed development.
- 6.443 A reduced visible aviation lighting scheme has been agreed with the CAA to reduce the number of aviation warning lights. Mitigation of visible turbine lighting has been embedded into the lighting design to reduce the intensity of the 2000 candela (cd) steady state lights in certain atmospheric conditions by reducing their intensity and attenuating the amount of vertical downward lighting in order to reduce the visual impact experienced by receptors below the lights (to 200cd).
- 6.444 As with almost any onshore wind farm development and acknowledged by Policy 11(e)(ii) of NPF4, it is recognised that the proposed development would give rise to some localised significant effects on landscape character and visual amenity.
- 6.445 Wind turbines give rise to a wide spectrum of opinions, ranging from strongly adverse to strongly positive, with a wide range of opinions lying somewhere between these two positions. Some people view wind turbines as incongruous or industrial structures whilst others view them as aesthetically pleasing, elegant structures, and a positive response to climate change. In the case of the proposed development, the turbines and associated ancillary development may be viewed by some as a symbol of continued progress by society towards a low carbon future.
- 6.446 In considering the effects of the proposed development, a precautionary approach has however been adopted, and it is therefore assumed that the effects identified would be adverse in nature even though it is recognised that for some people the impacts could be perceived to be beneficial.
- 6.447 There are no definitive quantifiable thresholds of acceptability in landscape and visual impact assessment (LVIA). The identified effects on landscape character and visual amenity therefore need to be balanced against the other benefits of the proposed development in the overall planning balance.

Summary of Effects on Landscape Character

- 6.448 The proposed development would result in direct and significant effects on the parts of the 'host' landscape character type, LCT 134: Sweeping Moorland and Flows (*Strath Fiag/ Tirry unit*), within which the proposed development is located as well as some indirect significant effects up to a distance of approximately 8km to the north-east, east, and south-east. Indirect and significant effects would occur to parts of the neighbouring LCT 135: Rounded Hills – Caithness & Sutherland including up to 5km to the south-west and south, up to 8km to the west and south-east, and up to approximately 5km to the north-west, north, and north-east. All other effects upon LCTs would be not significant.

Summary of Visual Effects

- 6.449 In relation to visual effects, it is accepted that the proposed development would be visible from various nearby properties and settlements, as well as parts of the surrounding road, footpath, and cycle networks.
- 6.450 It has been assessed that there would be significant visual effects experienced at eight of the 20. representative viewpoints during daylight hours. During darkness hours, significant effects are predicted at only three of the 20no. agreed LVIA viewpoints, namely at **Viewpoint 1: A838 near Fiag Bridge, Viewpoint 2: Loch Fiag and Viewpoint 4: A838 near Sithean Dubh Mor.**
- 6.451 In terms of the effects on residential properties within 4km, the Residential Visual Amenity Assessment (RVAA) (see **Technical Appendix 6.6**), found that one of the seven properties assessed would experience a significant visual effect from either a part of their house, garden, or principal access route (at Taigh Na Dreoilin/ East Overscaig). It is however concluded that none of the residents of any occupied private property would experience such an overbearing or overwhelming effect on their visual amenity that their properties would become unattractive places in which to live.
- 6.452 In relation to settlements, the assessment found that the settlement of Shinness, located approximately 8.5km to the south-east, would experience significant visual effects during daylight hours. An individual property, namely Aultnacoarach located approximately 4.7km to the south-east, would experience significant effects during daylight hours and hours of darkness.
- 6.453 The assessment of recreational receptors found receptors on the John o' Groats Cycle Route would experience significant effects during daylight hours on the section of the route that passes near Crask Inn to the east. All other effects upon recreational receptors during daylight and hours of darkness are deemed to be not significant.
- 6.454 The assessment of roads found that receptors would experience significant effects during daylight hours from sections of the A838 up to approximately 8km to the south-east of the proposed development. All other effects upon roads during daylight and hours of darkness are deemed to be not significant.

Summary of Effects on Assynt-Coigach NSA

- 6.455 In terms of effects on the Assynt–Coigach NSA. Five of the ten Special Landscape Qualities (SLQs) were identified as requiring further analysis and assessment. In summary, the assessment did not identify any significant effect on the five SLQs assessed in detail. Therefore, it is concluded that the overall integrity of the NSA would not be compromised.

Summary of Effects on Local Landscape Areas

- 6.456 Regarding Ben Klibreck and Loch Choire LLA. Whilst it is acknowledged that there would be some localised effects upon landscape character and visual amenity experienced from a small part of the LLA and some influence upon two out of the four SLQs of the LLA, overall, there would not be significant effects upon the special qualities of the Ben Klibreck and Loch Choire LLA. Therefore, the addition of the proposed development was judged to not undermine the understanding or appreciation of the underlying landscape of the LLA or its special qualities.

Summary of Cumulative Landscape and Visual Effects

- 6.457 Regarding cumulative effects, it is acknowledged that wherever more than one wind farm is visible at any given location in the landscape, there will be a greater overall or cumulative effect on landscape character than if just one wind farm was visible in the landscape. Likewise, it is acknowledged that the more wind turbines that are constructed in any given landscape, the greater the magnitude of overall (or combined) change to the landscape character.
- 6.458 At the time of preparing this LVIA, there were ten other wind farms within 20km of the Site which were either operational, under construction, or in-planning, plus the Invercassley development, which is at scoping/ pre-application stage.
- 6.459 In the first cumulative scenario considered (where other consented wind farms are also considered to be operational), there would be five additional developments: Creag Riabhach Extension, Chleansaid, Strath Tirry, Achany Extension, and Sallachy 2nd Submission. Each of the developments are located to the north-east, south-east, south, and south-west of the Site at varying distances between 3km and 14km.
- 6.460 In the cumulative assessment, it was recognised that the introduction of the consented developments into the baseline landscape would extend the existing influence of wind farms present in views within 20km of the Site.
- 6.461 Whilst the addition of the proposed development would extend the influence of wind turbines in views from certain locations, the presence of the consented developments means the proposed development would not result in any change to the solus effects identified in the main assessment, nor would it introduce a cumulative significant effect.
- 6.462 Indeed, the future baseline conditions brought about the consented developments would have the potential to reduce the solus effects attributed to the proposed development either by:
- Introducing wind turbines into views void of visibility of any existing developments.
 - Owing to the proximity of the consented sites to the existing operational wind energy development which has already been considered in the main assessment, i.e. the extension developments at Creag Riabhach and Achany; or
 - Owing to one or other consented development appearing in the foreground of the view, serving to reduce the potential for visual effects as a result of the proposed development, as shown in **Viewpoint 6: Maovally and Viewpoint 12: Ben More Assynt**.
- 6.463 Consequently, the predicted cumulative visual effects, are judged to be no greater than those identified in the main assessment during daylight and darkness hours.
- 6.464 In the second cumulative scenario (where other developments in-planning are also considered to be consented and operational) there would be two further additional developments to consider: Shinness, which would be located around 5km to the south-

east, and Allt An Tuir, which would be located around 17km to the south of the proposed development.

- 6.465 In the context of the existing wind energy development at Achany and Rosehall, the Allt An Tuir development is judged to have minimal potential to result in any cumulative effects on views when witnessed with the proposed development, beyond those already set out in the main assessment.
- 6.466 In the case of the Shinness development, this has the potential to be seen simultaneously with the proposed development in **Viewpoints 3, 6-16, and A-D**. Indeed, in several viewpoints, including **Viewpoints 8, 9, and 11**, the Shinness development would be seen in the very foreground of the view.
- 6.467 The presence of the Shinness development would serve to reduce the potential for visual effects from the proposed development by its addition serving to further establish wind energy as a visual component in the wider landscape. Whilst true, it is recognised that Shinness and the proposed development would often appear in views as discrete wind farms, adding further turbines in a different part of the landscape from the existing baseline and consented developments.
- 6.468 When considering that the consented developments are predicted to lower the effects predicted when assessing the effects of the proposed development against the current baseline conditions, the resulting change – and predicted rise in effects - brought about by the introduction of the proposed development and Shinness is ultimately predicted to be no different to the judgements presented in the main assessment across daylight and darkness hours.
- 6.469 There is only one scoping/ pre-application stage development located within 20km of the Site: Invercassley Wind Farm, which lies approximately 15km to the south south-west of the proposed development. Were Invercassley included in the baseline landscape, alongside the proposed development, the combination would add further turbines, increasing the influence of wind farms in certain landscapes and views. The majority of time there would however be no or minimal prospect for intervisibility between the two sites owing to screening provided by intervening landform and tree cover, and/ or attenuation by distance. As a result, it is judged that there would not be any change to the results presented in the assessment during daylight or darkness hours when assessing the effects of the proposed development against the current baseline conditions.
- 6.470 With regards to the Totality of the Combined Effects of all developments, the closest operational developments to the proposed development are the Creag Riabhach development that comprises 22no. turbines and lies approximately 7.5km to the north-east of the Site, and the Achany and Rosehall developments that comprise 19no. turbines each, and that both lie approximately 16km-17km south-east of the proposed development. Other operational developments are located beyond 20km, to the north-east, south-east, and south of the proposed development.
- 6.471 Overall, collectively the operational developments serve to result in wind energy being seen as a notable feature in many views in the landscape of the wider study area to the north-east, south-east, and south of the Site. The addition of the proposed development would serve to reinforce this pattern of wind energy, albeit extending the significant effects into a separate area further to the north and west.

Conclusions

- 6.472 It is important to acknowledge that localised significant effects on landscape character and visual amenity are inevitable as a result of commercial wind energy development anywhere in the UK. Whilst the LVIA identified some significant landscape and visual effects, it is considered that the landscape has the capacity to accommodate the effects identified.
- 6.473 Appropriate design mitigation has been embedded into the design of the proposed development to limit the extent of significant landscape character and visual effects to within 10km from proposed development; although, significant effects do not extend across the whole of this area.
- 6.474 The majority of effects within this area are **not significant**. There are extensive tracts of land beyond 10km of the proposed development to the north, east, and west in particular where there is no theoretical visibility of the proposed development and consequently no effects are experienced, as illustrated by the blade tip and hub height ZTVs at **Figure 6.3 to Figure 6.9** (see **Volume 2 of this EIA Report**).
- 6.475 Significant visual effects experienced by receptors using core paths, recreational routes and roads within this extent are confined to very short, limited sections of the overall routes and the remainder of the routes either experience effects that are **not significant** or no effects at all where there is no theoretical visibility, as detailed in **Table 6.13: Summary of Residual Effects** below.

Table 6.13: Summary of Residual Effects

Likely Significant Effect	Mitigation	Means of Implementation	Residual Effect
During Construction			
Effects on existing landscape features	No additional mitigation – consideration of landscape and visual matters was inherent in the design process	By design	Worst case Moderate/ minor non-significant effect to commercial coniferous forestry plantation and to watercourses and drainage channels.
Effects on LCTs within which the proposed development is located	No additional mitigation – consideration of landscape and visual matters was inherent in the design process	By design	Worst case Moderate significant effect to the part of LCT 134: Sweeping Moorland and Flows (<i>Strath Fiag/Tirry unit</i>) where the proposed development would be located in.
Indirect effects to other LCTs	No additional mitigation – consideration of landscape and visual matters was inherent in the design process	By design	Worst case Moderate not-significant effects to parts of surrounding LCTs, including LCT 135: Rounded Hills Caithness & Sutherland (<i>Loch Shin Rounded Hills unit</i>) and LCT

			135: Rounded Hills Caithness & Sutherland (<i>Loch Fiag Rounded Hills unit</i>).
LVIA Viewpoints	No additional mitigation – consideration of landscape and visual matters was inherent in the design process	By design	Worst case Moderate not-significant effects from six viewpoints.
Visual effects	No additional mitigation – consideration of landscape and visual matters was inherent in the design process	By design	Worst case Moderate non-significant temporary effect from the A838.
During Operation			
Effects on LCTs within which the proposed development is located	No additional mitigation – consideration of landscape and visual matters was inherent in the design process	By design	Worst case Moderate significant effects extending up to approximately 8km to LCT 134: Sweeping Moorland and Flows (<i>Strath Fiag/Tirry unit</i>).
Indirect effects to other LCTs	No additional mitigation – consideration of landscape and visual matters was inherent in the design process	By design	Worst case Major/ moderate significant effects extending to approximately 5km from the proposed development on LCT 135: Rounded Hills Caithness & Sutherland (<i>Loch Shin Rounded Hills unit</i>) and LCT 135: Rounded Hills Caithness & Sutherland (<i>Loch Fiag Rounded Hills unit</i>).
LVIA Viewpoints during daylight hours	No additional mitigation – consideration of landscape and visual matters was inherent in the design process	By design	Worst case Significant effects from 8no. of the 20no. LVIA Viewpoints Major significant effects from Viewpoint 2: Loch Fiag.

LVIA Viewpoints during darkness hours	Reduced aviation lighting design proposed	By design	Worst case Significant effects from 3no. of the 20no. LVIA Viewpoints Major/ moderate significant effects from Viewpoint 2: Loch Fiag.
Effects on settlements/ properties during daylight hours	No additional mitigation – consideration of landscape and visual matters was inherent in the design process	By design	Worst case Significant effects from Aultnacoarach and Shinness Major/ moderate significant effect from Aultnacoarach.
Effects on settlements/ properties during darkness hours	Reduced aviation lighting design proposed	By design	Worst case Significant effects from Aultnacoarach Moderate significant effect from Aultnacoarach
Effects on recreational receptors during daylight hours	No additional mitigation – consideration of landscape and visual matters was inherent in the design process	By design	Worst case Major/ moderate significant effect from John O'Groats Cycle Route – near Crask Inn to the east.
Effects on recreational receptors during darkness hours	Reduced aviation lighting design proposed	By design	Worst case No significant effects from recreational receptors.
Effects on road users during daylight hours	No additional mitigation – consideration of landscape and visual matters was inherent in the design process	By design	Worst case Moderate significant effects from the A838 up to 8km to the south-east.
Effects on Road Users during darkness hours	Reduced aviation lighting design proposed	By design	Worst case Moderate significant effects from the A838 up to 5km to the south-east.

Effects on designated landscapes	No additional mitigation – consideration of landscape and visual matters was inherent in the design process	By design	Worst case No significant effects from designated landscapes.

Bold text indicates a significant effect.

Coille Linne Wind Farm

Environmental Impact Assessment Report Volume 1 Chapter 7: Cultural Heritage and Archaeology

June 2025

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7 CULTURAL HERITAGE AND ARCHAEOLOGY

Introduction

- 7.1 This chapter has been prepared to consider the likely significant effects of the Coille Linne Wind Farm (the 'Proposed Development') on cultural heritage (historic environment sites and features, archaeology, and built heritage); hereafter referred to as 'historic assets.'
- 7.2 The chapter is supported by Appendix 7.1: Cultural Heritage and Archaeology Baseline and Figures 7.1 to 7.4:
- Figure 7.1 - Heritage Assets assessed within EIAR;
 - Figure 7.2 - Heritage Viewpoint locations;
 - Figure 7.3 to 7.4 Photomontages and wireline visualisations for Heritage Viewpoints 1 and 2; and,
 - Further photomontages provided by the landscape team which correspond with and/or provide indicative views from heritage assets, comprising Landscape Viewpoint 15, located in EIAR Volumes 3 and 5. .
- 7.3 The Cultural Heritage Chapter was prepared by Donald Sutherland, Principal Heritage Consultant at Pegasus Group. Donald has been a heritage professional for over 10 years and has extensive experience undertaking cultural heritage assessments. The assessment has been carried out in accordance with the Chartered Institute for Archaeologists 'Code of Conduct' (CIfA 2014, revised 2021) and with reference to the relevant statutory and planning framework for cultural heritage
- 7.4 The specific objectives of the Cultural Heritage Baseline and EIAR Chapter are to:
- Identify the cultural heritage baseline within and in the vicinity of the Site.
 - Assess the Site in terms of its archaeological potential.
 - Consider the effects of the construction, operation and decommissioning of the Proposed Development on heritage assets, within the context of the relevant legislation and planning guidance.
 - Identify significant effects arising from the Proposed Development.
 - Consider the cumulative effects of the Proposed Development in combination with other proposed developments, upon cultural heritage assets and identify any significant cumulative effects
- 7.5 It assesses the potential direct, physical effects on assets within the Site and the effects of the Proposed Development on the settings of heritage assets in the wider landscape.

Legislation and Policy Context

- 7.6 A full and detailed consideration of all relevant legislation and policy relevant to this application can be found in the Planning Statement which accompanies this application,

and a discussion of relevant policy and legislation can also be found in section 3 of Technical Appendix 7.1.

7.7 The following legislation was reviewed as part of the baseline study:

- Ancient Monuments and Archaeological Areas Act 1979;
- Planning (Listed Buildings and Conservation Areas (Scotland) Act 1997 (as amended by Historic Environment (Amendment) (Scotland) Act 2011); and,
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended).

7.8 The primary planning policy and guidance at the national level comprises:

- National Planning Framework 4 (NPF4) (2023);
- Historic Environment Policy for Scotland (HEPS) (2019);
- Scottish Natural Heritage (now NatureScot) & Historic Environment Scotland (2018) 'Environmental Impact Assessment Handbook';
- Chartered Institute for Archaeologists (revised edition, October 2020) 'Standard and Guidance for Historic Environment Desk-Based Assessment';
- Historic Environment Scotland (2020) 'Managing Change in the Historic Environment: Setting';
- Onshore Wind Sector Deal for Scotland 2023;
- Planning Advice Note 2/2011: 'Planning and Archaeology' (PAN 2/2011).

7.9 At the regional and local level, planning policy and guidance is set out in:

- The Highland-wide Local Development Plan, adopted April 2012;
- The Caithness and Sutherland Local Development Plan, adopted August 2018;
- Supplementary guidance in Onshore Wind Energy Development: Supplementary Guidance, November 2016, and Addendum Supplementary Guidance: 'Part 2b', December 2017; and,
- Supplementary guidance in The Highland Historic Environment Strategy, Supplementary Planning Guidance, 2013.

Scoping and Consultation

7.10 Consultation was undertaken with Historic Environment Scotland (HES) and Highland Council's Archaeology Service both as part of the 2024 Scoping Request and throughout the preparation of the application.

7.11 The details of the consultation are set out in the table below:

7.12 Table 7.1 below summarises the responses received relevant to the cultural heritage assessment.

Table 7.1: Consultation Responses

Consultee	Summary of Response	How / where addressed
Historic Environment Scotland 29/07/2024	Formal Scoping Opinion – Identified an initial list of historic environment assets with the potential to experience impacts: - Cnoc Olasdail, hut circles & field systems (SM4375) - The Ord, Chambered Cairns, Cairns, Settlements and Field Systems (SM1812) Photomontages were requested from these two assets. Queried the identification of assets within 10km of the Site utilised in the Scoping methodology, recommending use of a ZTV in the first instance.	The identified assets as well as other assets in the wider vicinity, both within, and beyond the 10km buffer have been considered within the baseline, and EIAR (paras. 7.66-7.80), where appropriate. Visualisations (including photomontages) have been prepared for the suggested assets, supplemented by landscape visualisations which have provided illustrative views from certain assets. A ZTV has been used to help to inform the assessment.
The Highland Council 13/09/2024	The EIAR needs to identify all designated sites which may be affected by the development either directly or indirectly. This will require you to identify: - the architectural heritage (Conservation Areas, Listed Buildings); - the archaeological heritage (Scheduled Monuments); - the landscape (including designations such as National Parks, National Scenic Areas, Areas of Great Landscape Value, Gardens and Designed Landscapes and general setting of the development; and - the inter-relationship between the above factors. We would expect any assessment to contain a full appreciation of the setting of these historic environment assets and the likely impact on their settings. Where the assessment finds that significant impacts are likely, appropriate visualisations such as photomontage and wireframe views of the development in relation to the sites and their settings should be provided. Visualisations illustrating views both from the asset towards the proposed development and views towards the asset with the development in the background would be helpful.	As above, designated heritage assets in the vicinity have been considered within the baseline and EIAR, informed by the ZTV and using professional judgement. Visualisations have been prepared where appropriate.

Consultee	Summary of Response	How / where addressed
	Historic Environment Scotland (HES) are anticipated to provide comment on the assessment methodology for heritage assets within their remit including the scope of the assessment and their requirements for supporting information (including visualisations) and the potential impacts on heritage assets in their consultation response. The Council's Archaeologist will provide further comments on archaeological matters for the PREMAJ Advice Pack, we therefore suggest that historic environment matters are not scoped out at this stage.	
The Highland Council 16/10/2024	Pre-Application Advice for Major Developments – Impact on the Historic Environment, Historic Environment Scotland HES recommend that any EIA report undertaken in support of the proposals should include a full assessment of impacts on the historic environment. The applicant should refer to the Environmental Impact Assessment Handbook Hist Env Scotland (historicenvironment.scot) for best practice advice on assessing cultural heritage impacts. The EIA report should provide an evidential base for the sieving of cultural heritage assets from any subsequent detailed assessment. This sieving exercise should give consideration for assets with long distance views which form part of their cultural significance and should be informed by a robust assessment and appropriate visualisations. There are no scheduled monuments, category A listed buildings, inventory battlefields, garden and designed landscapes or world heritage sites within the proposed development boundary. Based on the information provided so far, there is potential for significant adverse impacts on a number of assets. Further assessment and visualisations will be required to demonstrate the extent of any impacts and whether these are significant enough to warrant an objection from HES. Identified two specific assets with the potential to experience impacts:	As recommended, a full assessment of impacts has been undertaken, and the EIA handbook has been referenced (see para. 7.22). The asset sieving process is outlined in paras. 7.50 to 7.55 and within Appendix 7.1: Cultural Heritage and Archaeology Baseline – Technical Appendix. Consideration has been given to assets with long distance views, and visualisations have been used where appropriate. Further assessment of relevant assets has been undertaken within Appendix 7.1: Cultural Heritage and Archaeology Baseline – Technical Appendix, and the EIA (paras. 7.66-7.80). As above, visualisations have been used to inform assessments. Both assets have been assessed.

Consultee	Summary of Response	How / where addressed
	- Cnoc Olasdail, hut circles & field systems (SM4375) - The Ord, Chambered Cairns, Cairns, Settlements and Field Systems (SM1812) Impact on the Historic Environment, Historic Environment Team The THC's Historic Environment Officer has not responded to the preapplication. It is likely that a walkover survey would be recommended to fully inform the baseline at this location. In addition, it is considered appropriate to recommend that paleoenvironmental survey is carried out. Overall, direct impacts to cultural heritage are not envisaged to be a significant constraint for the proposed development. The ES chapter should consider the potential direct impacts of the development to cultural heritage as well as indirect impacts. Where indirect impacts are predicted, these will be illustrated using photomontages.	A programme of fieldwalking is proposed to take place in the first instance on the area of the proposed turbines, crane pads and access tracks to identify any archaeological assets which may be present within the areas and may be impacted by the proposed scheme. (see para 7.90). Both direct and indirect impacts are considered in this ES chapter.
HER Officer – Highland Council 20/12/2024	Email received in relation to HER search clarifying that there were no known archaeological sites within the Site, only a few records within 1km, and relatively little beyond. It was recommended that the online HER database was used to review records in the vicinity, and that, if required, datasets for designated assets should be downloaded from Historic Environment Scotland.	Data was reviewed using the online database, as requested, with shapefiles brought over to ArcGIS for figures. This data was supplemented by NRHE data from Historic Environment Scotland. Datasets for designated heritage assets were obtained from Historic Environment Scotland.

Elements Scoped Out of Assessment

- 7.13 No elements of the historic environment have been scoped out of the assessment. The Cultural Heritage and Archaeology Baseline (Technical Appendix 7.1) sets out the sieving process which has been used to reduce the number of historic assets considered within this Chapter to ensure that only those assets where an effect is considered likely are discussed.
- 7.14 It is noted that photomontages have not been carried out for every heritage asset identified by consultees. It was considered that not all of the assets warranted a full photomontage given the relative lack of visibility/predicted impact. The choice of photomontage/wireline was undertaken early in the assessment process following a desk-based review and analysis of the Zone of Theoretical Visibility. This was then cross-referenced with the assets, and a list was drawn up of photomontages and wirelines. Specific photomontages were requested from two assets by Historic Environment Scotland in their formal Scoping Opinion. These are included (Cultural Heritage Viewpoint 1, and

Landscape Viewpoint 15) and an additional wireline from Cultural Heritage Viewpoint 2 was added for robustness, to support the assessment.

Methodology

Study Area

- 7.15 All of the study areas used to assess effects from the Proposed Development have been measured from the red line boundary.
- 7.16 For designated assets, a search area of 10 km was taken from the Proposed Development boundary.
- 7.17 Professional judgement has been used to consider assets beyond this distance to ensure there were none within proximity to the study area which had the potential to experience impacts from the Proposed Development. No assets beyond their relevant study area have been assessed as having the potential to experience impacts from the Proposed Development.
- 7.18 The search area for non-designated historic assets (archaeological sites, findspots, locally significant buildings, locally historic landscapes) is 1 km from the Proposed Development. Data was also reviewed for regionally significant assets out to 5 km, and for potentially nationally significant assets, as identified by the DGHER, out to 10 km from the Proposed Development boundaries. A number of the identified potential nationally significant assets corresponded with designated assets which have been assessed as part of the EIA Chapter.

Desk Study

- 7.19 The following information sources were consulted as part of the desk-based assessment:
- Historic Environment Scotland data download portal – for up-to-date information on designated historic assets;
 - Highland Historic Environment Record - for data on non-designated historic assets;
 - Canmore/National Record of the Historic Environment (NRHE) - for data on non-designated historic assets;
 - Historic-Land-use Assessment Data for Scotland obtained from HES data download portal;
 - Mapping from the National Library of Scotland website and other sources;
 - Documentary sources, including online resources such as Scotland's Places and grey literature reports including EIAs and baselines for other wind farm schemes in the area;
 - Modern and historic aerial photographs held at the National Collection of Aerial Photography (NCAP) and using Google Earth; and,
 - Online resources including Ordnance Survey Open Source data; geological data available from the British Geological Survey.

Field Survey

- 7.20 A site visit was undertaken by a Principal Heritage Consultant on 3rd-4th March 2025. The purpose of this site visit was to visit identified historic assets to visually assess their setting and to analyse the views from these assets to establish if and to what extent these contributed to their cultural significance.

Assessment Methodology

- 7.21 The assessment has been carried out following the results of site visits, review of guidance documentation and the results of desk-based assessment and professional judgement.
- 7.22 The basis of assessment has been undertaken using guidance from a number of sources including the 2018 Environmental Impact Assessment Handbook produced by Historic Environment Scotland and Scottish Natural Heritage (now NatureScot). This process is intended to be an aide to assessment. It is acknowledged that tabular and matrix-led assessments can sometimes lead to an inflation or underestimation of the true effects of a development due to the mechanical process, however, professional judgement is used where appropriate to ensure a true reflection of the impact is considered on the historic environment resource. This includes a narrative consideration of the impacts and effects where necessary.

Assigning Sensitivity to Heritage Assets

- 7.23 The value/sensitivity of an historic asset for the purposes of Environmental Impact Assessments is determined by professional judgement guided by statutory and non-statutory designations, national and local policies, though the professional judgement is used for example if archaeological assets are shown to be of schedulable quality, the level of value will be a reflection of this. This process is outlined in Table 7.2.

Table 7.2 – Criteria for establishing the Value/Sensitivity of Heritage Assets

Sensitivity of Asset	Definition / Criteria
High	Remains of inscribed international importance, such as World Heritage Sites. Conservation Areas of high value. Category A Listed Buildings. Scheduled Monuments. Gardens and Landscapes which appear on the Inventory. Battlefields which appear on the Inventory. Designated historic landscapes of international sensitivity with exceptional coherence, time-depth. Non-designated assets of national importance.
Medium	Category B & C Listed Buildings. Conservation areas of local quality and regional value. Assets that can be shown to have particularly important qualities in their fabric or historical association or can contribute significantly to acknowledged international or national research objectives. Non-designated assets of regional importance.

	Designated landscapes of high quality and importance, and of demonstrable national sensitivity.
Low	Non-designated assets of local importance. Assets of limited value, but with the potential to contribute to local research Historic landscapes with specific and substantial importance to local interest groups, but with limited sensitivity.
Not Significant	Archaeological sites compromised by poor preservation. Sites of findspots (asset previously removed) with no contextual associations. Assets identified as having no historic, evidential, aesthetic, or communal interest.

7.24 As part of this assessment of value, the contribution made by setting will be set out in terms of a positive, negative, or neutral contribution and an assessment will be made of how sensitive the setting of the asset is to change. This will be set out within the narrative, rather than following a tabulated system. The reason for this is the setting of an asset is not homogenous – it will change and encompass many different elements, depending on the asset. Therefore, trying to assign a single level of sensitivity to setting would not be an effective way of assessing change.

Assessing Level of Impact

7.25 Once a level of value/sensitivity has been assigned, the level of impact from the development is assessed. Potential impacts are defined as a change resulting from the development which affects the cultural significance of an historic asset. These impacts are considered in terms of being either direct, indirect, or cumulative, from construction or operation, and temporary, long-term, or permanent. The assessment will include consideration of an asset's setting.

7.26 The level of an impact can be judged in a five-point scale as set out in Table 7.3 below. The impact score is arrived at without reference to the importance of the asset and the impact is assessed without taking into account any subsequent mitigation proposals.

Table 7.3 – Criteria for establishing Level of Impact

Impact	Criteria
High	Total removal or substantial alteration of asset, such that the physical resource or the key components of its setting are totally altered resulting in complete change to an asset's setting and heritage value of the asset.
Medium	Partial alteration of an asset, such that the heritage value of the resource or the key components of its setting are clearly modified.
Low	Minor alteration of an asset, such that the components of its setting are changed, but the physical characteristics are not affected, and the impact does not result in a loss of heritage value.
Minimal	Slight changes to historic elements that hardly affect the setting of an asset and do not result in any loss of value.
No impact	No change to fabric or a change to setting which results in no change to the key characteristics of the asset.

Criteria for Assessing the Significance of Effects

- 7.27 The assessment of effects will be undertaken in two stages. The magnitude of impact is cross-referenced with the value of the asset (sensitivity) to categorise the effect that is likely to result from the Proposed Development.
- 7.28 Following this stage, further consideration of mitigation is carried out, and the mitigation is assessed as to whether this would reduce the significance of the effect (the impact remains unchanged). Once further mitigation is applied, the asset is re-assessed, allowing the residual effect to be determined, as seen in Table 7.4.

Table 7.4 – Significance of Effect

Magnitude of Impact	Sensitivity of Asset			
	High	Medium	Low	Not Significant
High	Major	Major	Moderate	Neutral
Medium	Major	Moderate	Minor	Neutral
Low	Moderate	Minor/Moderate	Minor	Neutral
Minimal	Minor	Minor	Minor	Neutral
No Impact	Neutral	Neutral	Neutral	Neutral

- 7.29 NPF4 Policy 7 d) identifies that development proposals affecting the setting of a listed building should preserve its character, and its special architectural or historic interest.
- 7.30 When considering scheduled monuments, Policy 7 h) iii. of NPF4 sets out that where a proposed development has the potential to have an adverse effect on a scheduled monument or the integrity of its setting, exceptional circumstances must be demonstrated to justify the impact, and that impacts have been minimised. Therefore, it needs to be shown that even if an adverse effect is found, as long as the integrity of the setting is preserved, the effect is considered acceptable.
- 7.31 It is understood that a matrix-led approach can sometimes artificially inflate or diminish the actual levels of effect experienced by an asset through the rigidity of the process. Professional judgement will be applied to the use of the matrix and the conclusions will also be set out within the narrative of the report to ensure a true reflection of the level of effect arising from the scheme is set out.
- 7.32 A significant effect in the professional judgment of Pegasus, for the purposes of the EIA Regulations, is considered to be Major adverse. Moderate adverse effects can be considered 'significant' or 'not significant.' The distinction is made by applying professional judgement to the matrix-led process, allowing a true reflection of the effect to be considered, rather than a level of effect which has been artificially inflated due to the constraints of the EIA process.

Baseline Conditions

- 7.33 A full discussion of the historic and archaeological background of the Proposed Development Area and study area can be found in Technical Appendix 7.1: Cultural Heritage Baseline.
- 7.34 The topography of the Site is undulating, with the lowest points being located along the roadside of the A838 as it passes Loch Shin. Land here extends to approximately 100m - 105m AOD. Land along the eastern boundary routes through Glen Fiag; following the course of the River Fiag as it flows into Loch Shin. The remainder of the Site broadly ascends to the peak of Meall Odhar (285m AOD), which is located near the north-western corner of the Site. The Site incorporates moorland and coniferous forestry associated with the Fiag Plantation.
- 7.35 A number of unnamed watercourses run in a generally easterly direction across the Site, draining into the River Fiag. The River Fiag drains into Loch Shin which lies approximately 1.2km from the Site boundary.
- 7.36 The Site, which is actively managed for commercial coniferous forestry, lies in the Sutherland area of the Highlands. The closest densely populated settlement, the village of Lairg, lies approximately 18.5km to the south-east of the Site. Residences are largely limited to scattered properties, or small property clusters such as at Overscaig, Shinness, Achnairn, Tirryside, and Altnaharra. The closest property is located approximately 3km from the nearest proposed turbine. The Overscaig Hotel is sited close to the shoreline of Loch Shin over 2km west of the nearest proposed turbine.
- 7.37 The Proposed Development Area is located within the administrative area of Highland Council.

Designations

- 7.38 As stated above designated heritage assets comprise listed buildings, scheduled monuments, conservation areas, gardens listed on the Inventory and battlefields listed on the Inventory.
- 7.39 Despite the scale of the search areas set out above, only a very small number of designated assets were identified within the study area. The designated assets comprise:
- One Scheduled Monuments; and,
 - Two Category C listed buildings.
- 7.40 One World Heritage Site (WHS) lies within the 10km search area and within the ZTV, the Flow Country World Heritage Site (ref. WH7). The WHS extends into the north-western extent of the Site, but is outside the area of Proposed Development. The Flow Country World Heritage Site is Scotland's first WHS designated purely for natural Criteria (xi and x). This is not therefore a cultural heritage WHS, or one with Outstanding Universal Values (OUVs) relating to heritage. As such, it will not be considered in the Cultural Heritage baseline or ES Chapter. The WHS will be assessed in **Chapter 8: Ecology**.

- 7.41 No Category A or B listed buildings, conservation areas, gardens listed on the Inventory, and battlefields listed on the Inventory were located within the search area.

Historic and Archaeological Background

- 7.42 A full historic and archaeological background can be found in Technical Appendix 7.1. For brevity, a summary is provided below:
- 7.43 No earlier prehistoric archaeology is recorded within the Proposed Development area or its immediate vicinity. However, in the wider landscape a number of prehistoric features such as cairns, and settlement sites are identified, several of which are scheduled monuments.
- 7.44 No Iron Age archaeology is recorded within the Proposed Development area; however, the location of a submerged possible crannog is recorded c.685m to the south (ref. MHG11896; NRHE ref. 4881). It is however possible that this is a natural feature rather than archaeological (see Appendix 7.1).
- 7.45 No records from either the early medieval or medieval periods are identified within the Proposed Development area or in the immediate vicinity, either in HER, or NRHE datasets.
- 7.46 A single element of post-medieval and/or modern heritage is recorded within the Proposed Development area, comprising the Loch Shin, Fiag Bridge, a road bridge which lies within the south-east of the Site, but will not be impacted by the proposals.
- 7.47 No other features from these periods are recorded, or have been identified within the Proposed Development area, with recorded heritage from these periods in the vicinity largely relating to agricultural features and/or small-scale rural settlement. This includes the turf-covered footings of at least four shielings c.30m east of the Site (ref. MHG10562; NRHE ref. 73043). Historic maps suggest that the Site has comprised open moor/heathland from at least the mid-17th century prior to the majority of the land within the Site being utilised for commercial forestry from the mid-20th century. This is in keeping with the Old (1794) and New (1845) Statistical Accounts of Scotland which record the parish as largely comprising hills and extensive tracts of heath.
- 7.48 It is anticipated that any further unknown archaeology within the Proposed Development is likely to be of early modern date and would be related to the agricultural history and use of the Site. It is not considered that the Site has the potential to contain archaeology of national significance or commensurate to a Scheduled monument.

Historic Landscape

- 7.49 The Historic Landscape Assessment (HLA) mapping identifies the majority of the Proposed Development Site as being Woodland and Forestry, dating from the 20th century to the present. The north-western extent of the Site is recorded as Moorland and Rough Grazing, dating from the late-20th century to present. This is in line with the historic mapping and aerial photographs reviewed, although it is considered likely that the moorland and rough grazing use of the Site pre-dates the late-20th century by some time (see Appendix 7.1).

Asset Sieving Process

- 7.50 As part of Landscape and Visual Impact Assessment (Chapter 6), a ZTV was produced (see figures 6.3-6.7, and 6.21-6.28). It is acknowledged that the ZTV is merely an aide to assessment and that the setting of historic assets is not a purely visual consideration; the cultural significance of an asset can be affected through changes to setting without visibility of the turbines. Therefore, those assets which fell outside of the ZTV within the study area were analysed to establish their setting and whether they had issues of intervisibility or historic associations with assets within the ZTV. No assets which lay outside the ZTV were found to have a setting which would be impacted by the Proposed Development; therefore, their cultural significance would not be affected.
- 7.51 One Scheduled Monument is located within the wider 10km study area, which also lies within the ZTV. Scheduled Monuments beyond the 10km study area were also considered, a number of which fell within the ZTV. The results of this sieving exercise identified two additional scheduled monuments with the potential to experience impacts from the Proposed Development. These three monuments are:
- Cnoc Olasdail, hut circles & field systems – Scheduled Monument (ref: SM4375);
 - The Ord, chambered cairns, cairns, settlements, and field systems – Scheduled Monument (ref. SM1812); and,
 - Cnoc a' Bhreac-leathaid, shielings and cairnfield 700m NNE of – scheduled monument (ref. SM5300)
- 7.52 The 10km study area contained two Category C listed buildings, one of which fell within the ZTV. These comprise:
- The Crask Bridge Over Chraigs Burn (ref. LB8017); and,
 - The Allt a' Chraigs Bridge Over Allt A' Chraigs (Burn)(ref. LB7153).
- 7.53 The Category C listed buildings have been considered within the Technical Appendix 7.1, and it is considered the Proposed Development Area does not form part of the setting of the assets, and that neither of the Category C buildings have the potential to experience impacts from the Proposed Development. These are scoped out of further consideration and not considered within this EIAR.
- 7.54 The Highland HER and National Record of the Historic Environment (NRHE) were consulted with regard to non-designated heritage assets in the vicinity. On review, all non-designated assets were scoped out due to the fact that their setting did not include the Proposed Development Area, nor were views that may potentially contain the Proposed Scheme an important element of the key character of these assets.
- 7.55 Where assets have been scoped out, a fuller explanation of this is given within the Technical Appendix 7.1.

Assumptions and Limitations

- 7.56 Information relied upon in the production of the baseline and EIAR is assumed to have been correct at the time of writing. This describes data provided by third parties such as

the Highland HER and the digital datasets of HES. Assessment of cumulative effects has been reliant on the availability of information on other developments.

Future Baseline

- 7.57 Several designated heritage assets in the wider vicinity of the Proposed Development are located within or adjacent to areas of commercial forestry, which at present, screen the Proposals from these assets (see Technical Appendix 7.1).
- 7.58 It is acknowledged that this is a dynamic landscape, however there is no evidence to currently suggest that this woodland will be removed in the lifetime of the application, or that further areas of woodland will be planted.
- 7.59 In the event that such woodland is removed, effects are considered to be comparable to other assets assessed in detail as part of the baseline assessment and this Chapter. It is therefore considered that the Proposed Development would not result in any significant effects, even in the event that such woodland was removed.

Assessment of Effects

Construction Phase

- 7.60 A detailed description of the Proposed Development is set out in Chapter 3: Project Description. The description below summarises those details of the Proposed Development that have particular relevance to this Chapter:
- Excavations required for 15 no. turbine bases;
 - Establishment of crane pads adjacent to 15 no. turbine locations;
 - Excavations required for a substation, and energy storage compound;
 - Formation of new internal site access tracks connecting each turbine;
 - Formation of a new access onto the A838;
 - On-site underground cabling;
 - Up to three borrow pit workings; and,
 - Temporary construction and storage compounds and ancillary infrastructure.
- 7.61 The associated infrastructure for each scenario will be contained within the respective identified micro sited areas (micro siting of 100m).
- 7.62 The construction of all aspects of the Proposed Development has the potential to physically impact upon unknown archaeological deposits which are considered as assets of low value. It should however be noted that the Proposed Development will all take place within an area of commercial forestry, which will potentially have impacted and/or removed any archaeological remains, should they have been present. Turbines will also be constructed via keyhole felling which will limit any impacts. Should archaeological deposits survive within the area of Proposed Development, and should they be disturbed, this would reduce and/or remove their archaeological significance, though there would be a record made of these assets before their removal. Therefore, the level of impact of

the Proposed Development is considered to be medium, resulting in a **Minor Adverse**, and not significant effect.

Operational Effects

7.63 Cultural Heritage and Landscape visualisations have been used to assist with the assessment of impact. These are outlined below and referenced in relation to the relevant asset(s). Photomontages have been provided for some assets so as to illustrate the location, size, and degree of visibility of the Proposed Development from certain assets. For others, wirelines have been created, which show the location and massing of the Proposed Development as a simple outline.

Table 7.5: Cultural Heritage Visualisation Photomontages and Wirelines

Figure Ref.	Figure Title - Site Name (& Ref No)
7.3	Cultural Heritage VP1 – Photomontages and wirelines from Cnoc Olasdail, hut circles & field systems (ref. SM4375)
7.4	Cultural Heritage VP2 – Wirelines from Cnoc a' Bhreac-leathaid, shielings and cairnfield 700m NNE of (ref. SM5300)

7.64 The following Landscape visualisation was co-located to provide illustrative views from both a Landscape and Cultural Heritage perspective:

- Landscape VP15 – Photomontages and wirelines from The Ord, to provide illustrative views from The Ord, chambered cairns, cairns, settlements, and field systems – Scheduled Monument (ref. SM1812)

Cnoc Olasdail, hut circles & field systems

7.65 The scheduled monument of **Cnoc Olasdail, hut circles & field systems** (ref: SM4375) is an asset of **high** value. This is a small settlement of five round houses on the south-western slope of a low, rounded hill, with at least one hut circle, clearance cairns, low banks and lynchets and more recent features including an annular enclosure. The importance and key characteristics of this asset are formed by its physical fabric and its intrinsic archaeological characteristics. These provide evidence of the prehistoric land-use and rural settlement.

7.66 The setting of this asset is formed by the low hill upon which it is located, and its situation overlooking the Tirry River Valley. The elevated position of the asset provides a vantage point from which wide-ranging views are available which take in a wide variety of landscapes including surrounding hills and along and across the Tirry River valley. However, views northwards and eastwards are more limited due to the rising slope in these directions. Due to the asset's location on the southern slope of this hill, views are primarily focussed, and extend furthest to the south, down and across the river valley. Further prehistoric features including hut circles and a burnt mound are also recorded to the south of the scheduled area, along the river valley which potentially represent contemporary features and are considered to form part of the asset's setting.

7.67 Cultural Heritage Viewpoint 1 was located at the monument and photomontages and wirelines were created (Cultural Heritage Viewpoint 1, Figure 7.3). The visualisations show

that there will be distant visibility of the upper extents of all turbines. In the majority of cases, this will largely be limited to the hubs and blades, although there is a varying degree of visibility e.g. with only blades, and possible limited hub visibility anticipated the southern (Turbines 14-15) and northern (Turbines 1-2) extents of the Proposed Development. Conversely, upper portions of the towers associated with some turbines in the central area are anticipated to be visible from the asset (e.g. turbines 5, 8, and 12). Although all turbines will be visible to some degree, there are some clustered/overlapping turbines which will reduce the overall extent and visibility of the Proposed Development (e.g. turbines 14 and 15, 10 and 13, 6 and 9, and 3 and 4). Although the central turbines will largely be observed against the distant hills, some blades will break the skyline, particularly towards the southern (e.g. turbine 12) and northern (e.g. turbine 3) extents of the Proposed Development. The visibility of the turbines is however tempered due to the distance from the asset (c.8.82km from the closest part of the asset to the nearest turbine). The turbines will also be observed beyond modern commercial forestry and will only be observed in peripheral views from the asset. The most important and focussed views south-wards, along the Tirry River valley will be unaffected by the proposals.

- 7.68 It is the case that turbines associated with the Proposed Development will be a visible feature within views north-westwards from this asset. However, these will be peripheral, distant views. The introduction of distant views of the upper extents of turbines would not cause any change in the ability to understand or appreciate the cultural significance of asset, or its past relationship with the surrounding landscape.
- 7.69 The key characteristics of this asset, most important views, and the elements which contribute towards its cultural significance will not experience change. The integrity of the setting of the asset would not be adversely affected. The level of impact is considered to be no impact. The effect would be **Neutral**, and not significant.

The Ord, chambered cairns, cairns, settlements, and field systems

- 7.70 The scheduled monument of **The Ord, chambered cairns, cairns, settlements, and field systems** (ref. SM1812), is an asset of **high** value. The monument comprises a landscape of prehistoric sites including two chambered cairns, cairns, a homestead, several hut circles and accompanying field systems including cairns of field-cleared stones, with the scheduled area covering c.55.57ha of land. The importance and key characteristics of this asset are formed by its physical fabric and its intrinsic archaeological and historic characteristics. These provide evidence of the prehistoric land-use, ritual funerary activity, and settlement activity of this area. The cairns, and burnt mound also have potential to reveal evidence of the culture and society who constructed these monuments through artefactual material and the contemporary land surface beneath them.
- 7.71 The setting of this asset is formed by the hill upon which it is situated. The summit of the hill provides a vantage point from which panoramic views are available which take in a wide variety of landscapes including surrounding hills, along Achany Glen to the south, and along Loch Shin to the north-west. However, given the large area covered by the scheduling, and range of features included, views vary across the asset, with the hill summit within the centre of the scheduled area limiting views from the downward slopes. Therefore, while views form part of the setting, these are variable and, while generally extensive, the direction in which these views extend varies according to where within the

scheduled area they fall. The range of features included within the scheduled area also have a variety of elements of the surrounds which form part of their setting and contribute to their cultural significance. The two chambered cairns occupy the most prominent locations, sited around the summit, as a result, the most extensive views extend from these features.

- 7.72 Landscape Viewpoint 15 was located at the monument, and photomontages and wirelines were created (Landscape Viewpoint 15). The visualisations show that there will be very distant views of all turbines in north-westward views from the asset. The visualisations indicate that portions of the towers, along with the hubs and blades of all turbines will be visible, however the clustering/overlapping of certain turbines (e.g. turbines 5, 8, and 15, and 1, 4, 7, and 9) reduce the overall breadth and extent of the visibility of some turbines. However, such views are anticipated to be limited to the northern extent of the scheduled area, with views from the southern extent being screened by the rising topography and impacted by the telecoms mast which sits within the scheduled area.
- 7.73 It is the case that the turbines associated with the Proposed Development will be a visible feature within views north-westwards from this asset, and will be seen in the periphery, of views focussed along Loch Shin. The turbines would largely be seen against the hills beyond and do not generally break the skyline, although the blades and hubs of some turbines within the south-western extent of the Proposed Development do extend into the skyline (e.g. turbines 12, and 14). However, given the distance from the asset to the Proposed Development (c.18.7km from the nearest turbine), and as indicated by the photomontage, that the turbines would be barely perceptible.
- 7.74 The Proposed Development will not interrupt any views of the loch or affect our ability to appreciate the relationship between this feature and the siting of the asset. Due to the distance between the Proposed Development and the asset, the visibility will be limited to such an extent that it would make no material difference to the view in terms of the cultural significance of the asset. The integrity of the setting of the asset would not be adversely affected. The level of impact is considered to be no impact. The effect would be **Neutral**, and not significant.

Cnoc a' Bhreac-leathaid, shielings and cairnfield 700m NNE of – scheduled monument (ref. SM5300)

- 7.75 The scheduled monument of **Cnoc a' Bhreac-leathaid, shielings and cairnfield 700m NNE of** (ref. SM5300), is an asset of **high** value. The monument consists of a number of elements comprising a small prehistoric cairn field consisting of a group of peat covered clearance cairns, along with a prehistoric hut circle c.8.4m in diameter, with a probable south-eastern entrance. The hut circle is surrounded by a field system formed of clearance cairns which covers approximately 16ha. A group of rectilinear structures, representing possible medieval/post-medieval shielings, along with associated enclosures are also included within the scheduled area. The importance and key characteristics of this asset are formed by its physical fabric and its intrinsic archaeological and historic characteristics. These provide evidence of the prehistoric and medieval/post-medieval land-use, and settlement activity of this area. The cairn also has potential to reveal evidence of the culture and society who constructed this monument through artefactual material and the contemporary land surface beneath the cairn.

- 7.76 The setting of this asset is formed by the slope north-facing slope of Cnoc a Bhreac-leathaid, overlooking the Feith Osdail river, upon which it is situated, and its association with the river and river valley which runs broadly east-west to the north of the asset. The slightly elevated position provides a vantage point which affords long distance views to the north, and to the east and west, along the river valley. Views southwards are restricted due to the rising slope and commercial forestry in this direction. Views from the asset form part of the setting, however due to the nature of the asset, it is considered that views which fall on the immediately surrounding river and associated valley are the most important views, with wider ranging views making little contribution to the cultural significance of the asset.
- 7.77 Cultural Heritage Viewpoint 2 is located at the monument and wirelines were created (Cultural Heritage Viewpoint 2, Figure 7.4). The visualisations show that, without vegetation, the upper extents of some towers (e.g. turbines 12, 10, 8, 6, and 5), along with the hubs and blades of all turbines associated with the Proposed Development may be a visible feature in distant north-westerly views from the asset. While the majority of the turbines, if visible, would be observed with hills in the background, some turbine blades may break the skyline in views from the asset (e.g. turbines 6, 5, 4, 1, and 2). Views will also further be limited towards the north of the scheduled area due to the lower elevation, along with the anticipated screening by the commercial forestry on the northern edge of the river valley.
- 7.78 It is the case that turbines associated with the Proposed Development may be a visible feature within views north-westwards from this asset. However, given the distance from the asset to the Proposed Development (c.14.57km from the nearest turbine), the visibility will be limited. The turbines will also be observed beyond modern commercial forestry and will only be observed in peripheral views from the asset. The most important and focussed views onto, and eastwards and westwards, along the Feith Osdail river valley will be unaffected by the proposals.
- 7.79 The key characteristics of this asset, most important views, and the elements which contribute towards its cultural significance will not experience change. The integrity of the setting of the asset would not be adversely affected. The level of impact is considered to be no impact. The effect would be **Neutral**, and not significant.

Decommissioning Phase

- 7.80 No significant effects are predicted arising from the decommissioning phase. The only impact associated with the decommissioning phase would be the reversal of any impact to cultural significance caused by the operational scheme.
- 7.81 There would be no impact on any unknown archaeological assets as this would have been mitigated during the construction phase where required.

Cumulative Effects

- 7.82 For the cumulative assessment, wind farm schemes within a 20 km search area for selected heritage assets were considered. This search area reflects the detailed study area used within the LVIA Chapter 6 for consideration of cumulative effects.

- 7.83 The schemes considered as part of this section are those schemes which are consented, but not yet constructed, and those in the planning stages. Operational wind farms have been considered as part of the baseline.
- 7.84 The assets considered within this section are those assets which have been assessed in the main body of the text above. This is because a cumulative effect can only occur with this scheme in combination with other schemes. Any impact which may arise from another scheme alone is a matter of the assessment for that scheme. Any impacts which arise from the Proposed Development alone are a matter for the main body of the assessment which has been considered in detail above.
- 7.85 In order to aide in the cumulative effects assessment, key Cultural Heritage Viewpoints, and relevant Landscape Viewpoints, which provide illustrative views from heritage assets, have been made into photomontages, one element of which includes a wireline showing the consented and in planning schemes, therefore the cumulative impacts can be assessed. In addition, the cumulative ZTVs (CZTVs) produced to support Chapter 6 – Landscape and Visual Assessment (EIAR Volume 2 Figure 6.34 – 6.36) have been utilised to assist in the assessment.
- 7.86 It should be reiterated that ZTVs imply a much greater geographical extent of influence on the landscape and views of it than would actually be the case. These cumulative ZTVs are based on a 'bare-earth' scenario – that is they have been created using terrain data only and do not include any buildings or vegetation as would be the case with a 'screened' ZTV. It therefore follows that the cumulative ZTVs also exaggerate the actual impacts of the turbines as they do not take account of vegetation or buildings in the landscape, which may restrict the nature and extent of views.

Cnoc Olasdail, hut circles & field systems

- 7.87 No impacts to the cultural significance of Cnoc Olasdail, hut circles & field systems are anticipated as a result of the Proposed Development, therefore no cumulative effects will occur.

The Ord, chambered cairns, cairns, settlements, and field systems

- 7.88 No impacts to the cultural significance of The Ord, chambered cairns, cairns, settlements, and field systems are anticipated as a result of the Proposed Development, therefore no cumulative effects will occur.

Cnoc a' Bhreac-leathaid, shielings and cairnfield 700m NNE of

- 7.89 No impacts to the cultural significance of Cnoc a' Bhreac-leathaid, shielings and cairnfield 700m NNE of are anticipated as a result of the Proposed Development, therefore no cumulative effects will occur.

Mitigation Measures

- 7.90 It is proposed that a programme of fieldwalking take place on the area of the proposed turbines, crane pads and access tracks to identify any archaeological assets which may

be present within the areas and may be impacted by the proposed scheme. Should archaeological remains be identified, consultation will be undertaken with Highland Council's Archaeologist, to assess whether archaeological investigation would yield results which could provide information to the archaeological record. If archaeological investigation was warranted, the scope of such works would be agreed with Highland Council prior to commencement.

Residual Effects

- 7.91 This assessment has concluded that there would be no adverse residual effects upon the cultural significance of any identified historic assets.
- 7.92 No residual effects which would be considered as significant in EIA terms have been identified as arising from the Proposed Development.

Summary of Effects

- 7.93 Table 7.6 provides a summary of the effects detailed within this chapter.

Table 7.6: Summary of Effects

Receptor	Value	Description of Impact (temporary or permanent, physical, or setting)	Magnitude of Impact	Level of Effect	Mitigation Proposed	Residual Effect (Significant/Not Significant in EIA terms)
Construction Phase						
Unknown archaeological deposits	Low	Physical, permanent from construction of turbines and ancillary features	Moderate	Minor Adverse	Programme of archaeological fieldwork	Minor Adverse – Not significant
Operational Phase						
Cnoc Olasdail, hut circles & field systems – Scheduled Monument (ref: SM4375)	High	Temporary, setting	No impact	Neutral	None	Neutral – Not significant
The Ord, chambered cairns, cairns, settlements, and field systems – Scheduled Monument (ref. SM1812)	High	Temporary, setting	No impact	Neutral	None	Neutral – Not significant
Cnoc a' Bhreac-leathaid, shielings and cairnfield 700m NNE of – Scheduled Monument (ref. SM5300)	High	Temporary, setting	No impact	Neutral	None	Neutral – Not significant

Coille Linne Wind Farm

Environmental Impact Assessment Report Volume 1 Chapter 8: Ecology

May 2025

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8 ECOLOGY

Introduction

- 8.1 This chapter considers the potential effects of Coille Linne Wind Farm (the proposed development') on Ecology.
- 8.2 This chapter is also supported by the following figures as contained within Volume 2: Figures:
- Figure 8.1: Site and designated sites
 - Figure 8.2: Habitat survey results
 - Figure 8.3: GWDTE locations and buffers
 - Figure 8.4: Areas for proposed mitigation
 - Figure 8.5: Carbon and peatland class map
 - Figure 8.6: Bat detector locations
 - Figure 8.7: Protected species survey results
 - Figure 8.8: Fish habitat survey locations
- 8.3 The chapter is supported by a number of Technical Appendices (as set out within Volume 4: Technical Appendices), comprising:
- Technical Appendix 8.1: Habitat Survey Report
 - Technical Appendix 8.2: Fish Habitat Survey Report
 - Technical Appendix 8.3: Outline Habitat Management Plan (OHMP)
 - Technical Appendix 8.4 : Bat Survey Report
 - Technical Appendix 8.5 : Biodiversity Net Gain Assessment
- 8.4 Protected species survey results are included in full in this chapter.
- 8.5 Other relevant chapters include Chapter 3: Project Description and Chapter 10: Geology, Hydrology and Peat.
- 8.6 The ecology survey and assessment have been undertaken by WildLife Consulting Limited and associates. Specifically, the botanical assessment has been undertaken by Rory Whytock Principal Botanist and Director (Whytock Ecology Ltd). Rory has a BSc in Wildlife Conservation and has been a habitat specialist for 13 years. He has served as vice county bryophyte recorder for Stirling, Ayrshire and Clyde Islands for the British Bryological Society and he is a member of CIEEM. The bat assessment has been undertaken by Lorraine Hamilton MSc, BSc, MCIEEM - Director (Cairn Ecology Ltd). Lorraine specialises in bats and has been an ecological consultant for 16 years. The remainder of the ecology assessment and overall approach and review has been undertaken by Colin Nisbet MSc, BSc, MCIEEM – Director (WildLife Consulting Ltd). Colin has 20 years' experience in ecological consultancy.

8.7 The aims of this assessment are as follows:

- Consider relevant legislation, policy, and guidance.
- Assess baseline data from desk-studies and site surveys to establish existing ecological interests on site, and within its immediate vicinity.
- Assess potential effects from the Proposed Development and their ecological significance, both directly and indirectly.
- Identification of cumulative effects with other wind developments.
- Identification of appropriate measures for mitigation and avoidance of potentially adverse effects from the Proposed Development.
- Identification of residual, significant effects from the Proposed Development following mitigation.

Legislation, Policy, and Relevant Guidance

8.8 Relevant legislation, policy and guidance has been consulted to inform the assessment of impacts. A list of pertinent documents are provided below; where specific documents have been consulted; these are referenced in the relevant section.

8.9 Scottish Natural Heritage (SNH) has been rebranded as NatureScot as of the 24th of August 2020. As such some guidance documents or consultation may refer to the original name used at the time of publication.

- Directive 2009/147/EC on the Conservation of Wild Birds (the Birds Directive) 1979;
- The Conservation of Natural Habitats and Wild Flora and Fauna (the Habitats Directive) 1992 (92/43/EEC);
- The Wildlife and Natural Environment (Scotland) Act 2011;
- Nature Conservation (Scotland) Act 2004;
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);
- The Protection of Badgers Act 1992;
- The Water Environment and Water Services (Scotland) Act 2003 (as amended);
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended);
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
- Scottish Planning Policy 2014;
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017;
- Environmental Impact Assessment Directive 2014/52/EU4;
- Chartered Institute of Ecology and Environmental Management. (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, and Coastal;
- Chartered Institute of Ecology and Environmental Management. (2013). Guidelines for Preliminary Ecological Appraisals;

- Institute of Environmental Management and Assessment. (2005). Guidelines for Environmental Impact Assessment; and
- Scottish Natural Heritage (2013) A handbook on environmental impact assessment.

Policy

8.10 Chapter 5: Renewable Energy and Planning Policy of the EIA Report sets out the planning policy framework that is relevant to the EIA process and the proposed development. The policies set out include those from the Highland Council Local Development Plan (LDP) relevant aspects of National Planning Framework 4 (NPF4) (Scottish Government, 2023), Planning Advice Notes and other relevant guidance.

- NPF4: Policy 1 - Tackling the climate and nature crises;
- NPF4: Policy 2 - Climate mitigation and adaptation;
- NPF4: Policy 3 - Biodiversity;
- NPF4: Policy 4 Natural Places;
- NPF4: Policy 5 – Soils;
- NPF4: Policy 11 Energy; and
- The Highland Council LDP: Policy 58 Protected Species.

Legislation and Guidance

- Directive 2009/147/EC on the Conservation of Wild Birds (the Birds Directive) 1979;
- The Conservation of Natural Habitats and Wild Flora and Fauna (the Habitats Directive) 1992 (92/43/EEC);
- The Wildlife and Natural Environment (Scotland) Act 2011
- Nature Conservation (Scotland) Act 2004;
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);
- The Protection of Badgers Act 1992;
- The Water Environment and Water Services (Scotland) Act 2003 (as amended);
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended);
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017;
- Environmental Impact Assessment Directive 2014/52/EU4;
- Chartered Institute of Ecology and Environmental Management. (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, and Coastal;
- Chartered Institute of Ecology and Environmental Management. (2013). Guidelines for Preliminary Ecological Appraisals;
- Institute of Environmental Management and Assessment. (2005). Guidelines for Environmental Impact Assessment; and

- Scottish Natural Heritage (2013) A handbook on environmental impact assessment.

Methodology

- 8.11 This section provides detail of the methods employed for the collection and analysis of data and the completion of the impact assessment. For general methodology in relation to the EIA please refer to EIA Volume 1, Chapter 2.

Desk Study

- 8.12 A desk study was undertaken to obtain records of sites designated for nature conservation within 5km of the site boundary and to obtain background records relating to protected species within 1km of the site. The site boundary is illustrated on Figure 8.1. The following sources were consulted as part of the desk study process:

- NBN Atlas (nbnatlas.org)
- Highland Biological Recording Group (HBRG); and
- NatureScot SiteLink (SiteLink@nature.scot).

Baseline survey

Habitats and vegetation

- 8.13 Habitats and vegetation were surveyed by Whytock Ecology Ltd. over a total of eight days. Surveys were carried out between the 30th of April to the 3rd of May 2024, then on the 16th, 17th, 25th and 26th of May 2024. The survey area comprised all land within the developable area and an additional 250m buffer zone.
- 8.14 A National Vegetation Classification (NVC) survey was undertaken in accordance with *British Plant Communities* (Rodwell, 1991-2000¹) and related guidance (Rodwell, 2006²) to precisely identify the vegetation across the surveyed area. This is necessary to meet the requirements of modern legislation, especially in the identification of Groundwater Dependent Terrestrial Ecosystems (GWDTE). Habitat types (composed of one or more NVC communities) are classified according to the 'Phase 1' system (JNCC, 2010)³ that provides a well-established overview.
- 8.15 Small scale habitat and vegetation variability and zones of transition result in mosaics or gradations of two or more NVC communities. In these areas, an approximate percentage cover for each community is provided.

¹ Rodwell, J.S. (1991-2000). *British plant communities*. 5 Volumes. Cambridge University Press.

² Rodwell, J.S. (2006). *NVC Users' Handbook*. Download available at <http://jncc.defra.gov.uk/page-3724>.

³ JNCC 2010. *Handbook for phase 1 habitat survey - a technique for environmental audit and other relevant information* available from <http://jncc.defra.gov.uk/page-2468>

- 8.16 Botanical nomenclature follows that of the standard sources (Atherton et al., 2010⁴; Coppins et al., 1992⁵; and Stace, 2019⁶).

Protected species

- 8.17 Protected species surveys (including detailed bat surveys) were undertaken by Wildlife Consulting and Cairn Ecology (bats) in 2024.
- 8.18 Protected species surveys were based on the site boundary. Protected species surveys were undertaken across all accessible land within 250m of the site.
- 8.19 Protected species surveys focussed on searches for the presence of otter *Lutra lutra*, water vole *Arvicola amphibius*, badger *Meles meles*, pine marten *Martes martes*, red squirrel *Sciurus vulgaris* and wildcat *Felis silvestris*. A watching brief was also kept, and signs recorded for other protected species potentially inhabiting the site, i.e. native reptiles such as adder *Vipera berus*, common or viviparous lizard *Zootoca vivipara*, and slow worm *Anguis fragilis*.
- 8.20 The site was assessed as low habitat risk to bats in line with the description of habitat provided in best practice guidance. As such the site was surveyed for ten consecutive nights in each of the spring summer and autumn seasons. Surveys were completed using Wildlife Acoustics Songmeter mini (full spectrum), Wildlife Acoustics Songmeter 4 and Wildlife Acoustics Songmeter 2. The devices were deployed at 13 predetermined locations (Figure 8.6). Each device was set up to record 30 minutes before sunset to 30 minutes after sunrise. The devices record in WAV and WAC formats.
- 8.21 Data was analysed using Wildlife Acoustics proprietary software, Kaleidoscope. A suitability qualified ecologist manually checked all species.
- 8.22 The Mammal Society's Ecobat online tool⁷ was also used to assist with bat analysis and assessment.

Consultation

- 8.23 As part of the Scoping exercise, a consultation exercise was undertaken to inform the design of the proposed development and to seek agreement on potential significant environmental effects that result from the proposed development as well as the scope of any assessment work required as part of this EIA.
- 8.24 The Scoping Opinion was received from ECU on 20th of September 2024.
- 8.25 A summary of these consultation responses relating to ecology is provided in Table 8.1.

⁴ Atherton, I., Bosanquet, S. & Lawley, M. (2010). Mosses and Liverworts of Britain and Ireland: a field guide. British Bryological Society.

⁵ Purvis, O. W., Coppins, B.J., Hawksworth, D. L. H., James, P.W. and Moore, D.M. (1992). The Lichen Flora of Great Britain and Ireland. Natural History Museum, London.

⁶ Stace, C.A. (2019). New Flora of the British Isles. 4th Edition. Cambridge University Press.

⁷ Mammal Society (2017). Ecobat. Available at: [http:// www.ecobat.org.uk](http://www.ecobat.org.uk)

Table 8.1: Consultation Responses

Consultee	Date Received	Consultation Response	Where and how is this addressed?
Highland Council	13 th September, 2024	The EIA should provide an up-to-date ecology baseline for habitats and protected faunal species. Effects on peatland and restoration and enhancement measures should be set out. Effects on sites designated for nature conservation should also be included in the assessment. The assessment should include effects on wild deer. The EIA should consider effects on watercourses and set out measures to safeguard these features. It should also take account of the consultation response from the local fishery board. Effects on Groundwater Dependent Terrestrial Ecosystems (GWDEs) should be included in the assessment.	An ecology baseline has been collected for the development. Effects of peatland, together with restoration and enhancement measures are set out within this chapter and also within the Outline Habitat Management Plan (Technical Appendix 8.3). Effects on sites designated for ecology are considered in this chapter and effects on sites designated for ornithology are presented in Chapter 9: Ornithology. A draft Deer Management Plan is included in Technical Appendix 8.3. Measures to safeguard watercourses are set out in this chapter, as well as in Chapter 10: Geology, Hydrology and Peat, and in Technical Appendix 8.3. Should the project be consented, surface water pollution prevention measures would also be committed to in a Construction and Environmental Management Plan (CEMP).
Fisheries Management Scotland	1 st August, 2024	The development should consider input from the Kyle of Sutherland District Salmon Fishery Board and Fisheries Trust.	Input from these organisations is considered in this assessment.
Kyle of Sutherland District Salmon Fishery Board (KDSFB)	7 th August, 2024	The KDSFB highlighted the importance of the River Fiag and associated watercourses, particularly in respect of its Atlantic salmon population. They highlight that the River Fiag and the Strath Duchally Burn are key receptors for salmon and	A Fish Habitat Survey has been undertaken to inform the development and is included as Technical Appendix 8.2 of the EIA. A fish habitat survey and a peat slide risk assessment (assessed as low risk due to shallow slopes and shallow peat depths) have been undertaken to inform the EIA.

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		represent important spawning and nursery areas. Baseline fish habitat, peat slide risk assessment, water quality, aquatic invertebrate, fish, and freshwater pearl mussels should be undertaken to inform the development. KSDSFB raised concerns about turbine blade movement triggering predator responses in fish and suggested 'Snell's Window' be considered when assessing potential effects on fish.	It is recommended that, following a consent and prior to construction baseline surveys are undertaken for fish fauna, water quality, aquatic invertebrates and freshwater pearl mussel. Such surveys should be undertaken, prior to, during and following construction. The minimum distances from the turbine bases to the Strath Duchally Burn and the River Fiag are 100m (115m to blade tip when factoring in hub height). Avian fish predators such as osprey scan for fish at heights of c. 70m⁸, which presumably does not trigger a flight response from fish. Accordingly, it is considered extremely unlikely that the fish using these watercourses will react to movement from operational turbines over 100m away.
NatureScot	26 th August, 2024	Assessment to consider potential effects on the Caithness and Sutherland Peatlands Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site, and Strath Duchally Site of Special Scientific Interest (SSSI) and the Flow Country World Heritage Site (WHS). Assessment to consider effects on peatland (bog) habitats and follow NatureScot guidance relating to compensatory restoration areas. National Vegetation Classification (NVC) level survey to be undertaken to inform development layout and micro-siting.	An assessment of potential effects on ecologically designated sites are included in this chapter, with effects ornithology assessed in Chapter 9. The OHMP sets out peatland restoration and enhancement measures within the SAC and WHS, which would serve to improve peatland habitats within these designations. The assessment of effects on peatland has been undertaken in line with NatureScot published guidance as advised. An NVC was undertaken to identify the locations and extents of areas of sensitive habitats and vegetation communities and thus inform the evolution of the development layout.

⁸ <https://forestryandland.gov.scot/learn/wildlife/osprey>

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		Protected species mitigation to be set out in the EIA. Effects of deer to be considered in the EIA.	Protected species mitigation measures are set out in this EIA chapter as required. A draft deer management plan is included in the OHMP.
SEPA		SEPA are content that the baseline surveys have identified GWDTEs and led to the application of appropriate buffers as part of the evolution of the development. SEPA referred the applicant to NatureScot guidance on peat. SEPA advised a commitment to oversized bottomless culverts or traditional style bridges for watercourse crossings. SEPA also provided guidance on an Outline Peat Management Plan; and handling of peat and pollution prevention during construction.	The evolution of the development design and the assessment of effects on peatland has been undertaken in line with NatureScot published guidance as advised. Oversized bottomless culverts or traditional style bridges will be used for watercourse crossings. Guidance on peat and pollution prevention is noted and applied where applicable.

Assessment Methodology and Significance

Assessment of effects

8.26 Effects are assessed against the habitat/species baseline in accordance with best practice guidance (CIEEM, 2018)⁹ and professional judgement in a methodology that is evidenced and appropriate to the proposed wind farm. Assessment involves the following stages:

- Identification of the potential development effects.
- Consideration of the likelihood of potential effects.
- Defining the conservation importance of ecological features, to determine a level of sensitivity.
- Establishing the spatial and temporal magnitude of effects.

⁹ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine v1.1. Available at <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.1Update.pdf>.

- Identification of significant effects (as defined by the EIA Regulations).
- Identification of mitigation measures to address significant effects.
- Opportunities for enhancement are considered where appropriate.
- Residual effects are identified, and their cumulative effect is assessed (in combination with neighbouring developments).

Identification of effects

8.27 Ecological features may be directly or indirectly affected by construction, operation and/or decommissioning in one or more of the following ways⁹:

- Direct and indirect habitat loss.
- Disturbance to/loss of breeding sites, resting places, roosts etc. for protected species.
- Direct/indirect loss of foraging resource for protected species.
- Displacement/disruption to habitat and species population connectivity.
- Direct effects upon protected fauna, i.e. road traffic accidents, etc.
- Environmental effects, i.e. pollution of watercourses, etc.
- Changes to habitat composition or quality through land-use change, increased human presence, etc.
- Collision mortality, barotrauma, and other injuries.
- Loss or damage to commuting and foraging habitat.
- Displacement of individuals or populations.

8.28 The potential for effects is identified from comparison of the Proposed Development characteristics outlined in the Scoping Report and Chapter 3: Project Description, contained within this EIA; and the behaviour and/or ecology of the habitats and species.

8.29 In line with the CIEEM EcIA guidance⁹, consideration is given to the following characteristics when identifying potential effects of the Development on Important Ecological Features:

- Nature of effect: whether it is positive (beneficial) to any important ecological features (IEF), e.g. by increasing species diversity or extending habitat, or negative (detrimental), e.g. by loss of, or displacement from, suitable habitat;
- Extent: the space over which the effect may occur;
- Magnitude: the size, amount, intensity, and/or volume of the effect;
- Duration: the persistence of an effect in relation to IEF characteristics (such as a crucial stage in a species' life cycle) as well as human time-frames;
- Frequency: the number of times an activity occurs in a given period may influence the resulting effect;
- Timing: this may result in an impact on an IEF if it coincides with critical life stages or seasons (e.g. breeding or summer drought); and
- Reversibility: a reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation (within a reasonable timescale).

Conservation importance

- 8.30 CIEEM guidance **Error! Bookmark not defined.** requires that nature conservation importance is defined in a geographical context as defined in **Error! Reference source not found.** Table 8.2. Evaluating a designated site is straightforward because the designation(s) indicate the importance. In the case of habitats and species, assigning value is dependent upon contextual information about designations, distribution, extent/abundance, historical records, and national trends. Consequently, even though a habitat or species may be protected through legislation at the national or international level, the importance of the population on a site may be quite different. For example, a single transitory animal or isolated patch of degraded habitat within the context of a thriving metapopulation or wider extent is of less importance than its designation.

Table 8.2: Geographical context for assessing conservation importance

Context	Criteria
International	• An internationally designated site. • Site meeting criteria for international designations or there is qualifying habitat/species connectivity with such a site. • Habitat/species present in internationally important numbers/extents (>1 % of national resource).
National	• A nationally designated site (e.g. SSSI or National Nature Reserve), or there is qualifying habitat/species connectivity with such a site. • Habitat/species present in nationally important extents/numbers (>1 % national resource).
County - Regional	• Habitat/species present in county or regionally important numbers (>1% of county or Biodiversity Action Plan resource, for example). • Areas of habitat falling below criteria for selection as a SSSI (e.g. areas of semi-natural ancient woodland >0.25 ha).
Local	• Local Nature Reserves (LNR). • Areas of semi-natural ancient woodland <0.25 ha. • Areas of habitat or species that contribute to the local ecological resource within the local context, (e.g. species-rich flushes or hedgerows).
Negligible	• Widespread, common, and/or reproducible habitats/species. • Negligible features are not normally considered in the assessment process.

Magnitude of effects

- 8.31 Effect magnitude relates development-related changes in the extent/abundance and/or the integrity of an ecological feature (habitat or species). 'Integrity' is defined by the European Commission as "the lasting preservation of the constitutive characteristics of the site that are connected to the presence of a priority natural habitat"¹⁰. This definition that is related to the Habitats Directive can be extended more widely to include species and non-designated habitats, and it is reiterated in Scottish Planning Policy. For example, the Scottish Executive circular 6/1995¹¹ states that "The integrity of a site is the coherence of its

¹⁰ European Commission Notices (2019/C 33/01). *Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC*. Available at: [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019XC0125\(07\)&rid=2](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019XC0125(07)&rid=2).

¹¹ <https://www.gov.scot/publications/foi-201900008726/>.

ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified".

- 8.32 Determining the magnitude of likely effects is therefore based on assessment of how inter-related ecological features (habitats or species) and their supporting process (e.g. water supply or prey availability) will respond to the Proposed Development at its different stages (i.e. construction, operation & decommissioning). Effects can be adverse, neutral, or beneficial and are assessed in relation to their spatial extent and temporal magnitude. The latter includes consideration of the duration, frequency, and persistence of effects; and their reversibility (passively or through mitigation). There are five magnitudes of spatial or temporal effect, respectively described in Table 8.3 and Table 8.4.

Table 8.3: Spatial effect magnitude levels

Magnitude	Definition
Very high	Almost complete loss of a feature (>80 %) or its supporting processes (e.g. water supply) that affects its long-term persistence.
High	Major loss of a feature (>20 %) or its supporting processes (e.g. water supply) that affects its long-term integrity.
Moderate	Moderate loss (10 % to 20 %) of a feature or its supporting processes that may result in its degradation.
Low	Minor loss (<10 %) of a feature or its supporting processes that may result in its modification.
Negligible	Minimal change or loss (<1 %) with effects not dissimilar to those expected within the semi-natural variability of the 'do nothing' scenario (e.g. drought).

Table 8.4: Temporal effect magnitude levels

Magnitude	Definition
Permanent	Effects continuing indefinitely beyond the lifespan of wind farm (35 years), except where there is likely to be substantial improvement after this period in which case 'Long Term' is appropriate.
Long term	Effects persisting for up to 35 years.
Medium term	Effects persisting for up to 15 years.
Short term	Effects persisting for up to 5 years.
Negligible	No effect.

Cumulative effects

- 8.33 NatureScot's current guidance¹² informs the cumulative assessment of effects in combination with neighbouring developments, plans, or projects. To focus on significant effects, this assessment considers the potential for impacts with other EIA developments. The context in which these effects are considered is dependent on the behaviour and/or ecology of the feature. For example, an animal population is considered in the context of its habitat (e.g. a catchment or woodland) and the connectivity of this with additional,

¹² SNH (2012). Guidance - Assessing the cumulative impact of onshore wind energy developments. Available at: <https://www.nature.scot/guidance-assessing-cumulative-impact-onshore-wind-energy-developments>.

necessary resources (e.g. for foraging, roosting, or breeding). Alternatively, extensive blanket bog may require to be considered at a larger/regional scale. Accordingly, assessment of cumulative impacts for each feature is undertaken at the scale appropriate to its behaviour and ecology.

Significance

- 8.34 Habitats/species of negligible or low conservation importance and those that are unaffected by the development are screened out of further assessment. The significance of impacts upon the remaining Important Ecological Features is determined through a combination of their conservation importance; the magnitude (nature, extent, and timescales) of the predicted effect; and professional judgement.
- 8.35 The latest CIEEM EclA guidance **Error! Bookmark not defined.** discourages use of the matrix approach to determine significance and describes only two categories: 'significant' or 'not significant.' A 'significant effect' is an effect that either supports or undermines conservation objectives for ecological features.
- 8.36 Maintenance of favourable conservation status involves a series of inter-connected principles¹³. These are summarised in the CIEEM EclA guidance for habitats and species as follows:
- Habitat conservation status is determined from impacts on distribution, extent, structure, and function, as well as typical species/communities.
 - Species conservation status is determined from impacts on abundance, behaviour, and distribution.

Assessment Limitations

- 8.37 No limitations to the baseline habitat surveys are identified.

Mitigation

- 8.38 As outlined in the CIEEM impact assessment guidance, the following mitigation hierarchy is adopted:
- Avoidance;
 - Reduction;
 - Compensation; and
 - Remediation.
- 8.39 As a result of this mitigation, all GWDTE assessed to be groundwater-dependent, including springs, are avoided and peatland impacts are limited to wet heath on shallow peat, and marginal areas of bog protected by confinement within closed basins. In addition, consideration is given to opportunities for enhancement. These are addressed in the

¹³ Favourable Conservation Status: UK Statutory Nature Conservation Bodies Common Statement 2018. Available at <https://data.incc.gov.uk/data/b9c7f55f-ed9d-4d3c-b484-c21758cec4fe/FCS18-InterAgency-Statement.pdf>.

Outline Habitat Management Plan (Technical Appendix 9.3) that proposes measures to enhance the ecological condition and extent of blanket bog at the site.

Residual impacts

- 8.40 As a result of the evolution of the design of the project and the implementation of the mitigation measures set out in this report it is predicted that there will be no significant impacts resulting from the development on the ecological resource.

Scope of Assessment

Effects Assessed in Full

- 8.41 The following effects were considered to be potentially significant in relation to Ecology at the scoping stage and have been assessed in full within this chapter:

- Direct habitat loss of important peatlands and related habitats;
- Direct habitat loss of wetlands and related habitats including base-rich flushes and Groundwater Dependent Terrestrial Ecosystems (GWDTEs);
- Direct effects on severance/fragmentation of the above habitats;
- Indirect effects on the above habitats; and
- Cumulative effect on the above habitats.

Effects Scoped Out

- 8.42 On the basis of the desk based and field survey work undertaken, the professional judgement of the EIA team, experience from other relevant projects and policy guidance or standards, and feedback received from consultees, the following topic areas have been 'scoped out' of detailed assessment, as proposed in the Scoping Report:

- Effects on common and widely distributed habitats outwith the following categories:
 - Habitats listed in Annex I to the Habitats Directive, and species listed in Annex II to the Habitats Directive.
 - Biodiversity Action Plan (UKBAP) or Scottish Biodiversity List (SBL) Priority Habitats.
 - Habitats or species protected by legislation such as The Wildlife and Countryside Act 1981 (as amended), the Nature Conservation (Scotland) Act 2004 (as amended).
- Loss of commercial conifer plantation, which has negligible ecological value.

Baseline Conditions

Desk Study

- 8.43 HBRG provided records of an otter *Lutra lutra* spraint on the Strath Duchally Burn, and a pine marten *Martes martes* scat within a 1km grid square within the desk study search area. No records of any resting places for either species was returned.

Field Survey Results – Habitats and Vegetation

8.44 The results of the Phase 1 Habitat and NVC surveys are provided in EIAR Volume 4, Technical Appendix 8.1. This data has been analysed and interpreted highlighting two elements within the overall habitat assemblage that are of local or greater than local nature conservation importance. These are:

- Peatland and related habitats, and
- Wetlands and related habitats.

8.45 The following sections describe these IEFs in more detail below.

8.46 A desk-based search for species records was carried out using the NBN atlas¹⁴. The search results yielded 555 plant records, consisting of 186 species. The majority of these species are found to be widespread locally and regionally. Some have a more restricted distribution nationally such as great sundew *Drosera anglica*, stag's-horn clubmoss *Lycopodium clavatum* and *Sphagnum strictum* (a moss).

Peatlands and related Habitats

8.47 This receptor has three main components that were recorded within the survey area; blanket bog, wet modified bog, and heath.

8.48 Blanket bogs within the survey area have been evaluated using the guidelines for the selection of SSSIs¹⁵. This guidance provides criteria and thresholds that is used to assess areas of peatlands that qualify for selection as a SSSI. Within this guidance, functioning hydrological peatland units are assessed based upon a range of criteria including size, peat formation capabilities, surface patterning, vegetation, and indicator species. In addition, the geographical location of the peatlands is taken into consideration. This is due to blanket bogs in the north and west of the UK typically supporting a different range of vegetation types to those in the south and east.

8.49 Using these criteria, some areas of blanket bogs within the Survey Area meet these thresholds and are considered to be of national importance for nature conservation. The blanket bogs present within the survey area corresponds to M2 *Sphagnum cuspidatum/fallax* and M3 *Eriophorum angustifolium* bog pool communities, M17 *Trichophorum germanicum* - *Eriophorum vaginatum* and M19 *Calluna vulgaris* - *Eriophorum vaginatum* blanket mires. The effects upon blanket bogs will be detailed in this assessment.

8.50 Wet modified bogs (specifically M25 NVC communities in the survey area) are often derived from blanket bogs that have been degraded through a combination or a mixture of drainage, grazing and commercial forestry plantations. From the information collected during the field surveys regarding composition and quality, wet modified bog vegetation is important for nature conservation at a regional level.

¹⁴ NBN atlas (2024) Accessed at <https://nbnatlas.org/>

¹⁵ JNCC (2024) Accessed at <https://jncc.gov.uk/our-work/guidelines-for-selection-of-sssis/>

- 8.51 The NVC survey has also identified wet dwarf shrub heaths within the Survey Area. Upland heath communities recorded on the site such as the M15 *Trichophorum germanicum* – *Erica tetralix* wet heath NVC community are listed on the Scottish Biodiversity Action Plan and the Highland Biodiversity Action Plan lists. Taking into consideration their composition, quality, and the relative frequency in the surrounding wider area, wet heaths within the Survey Area are considered to be of regional importance.
- 8.52 In summary, the main component (habitat considered to be most sensitive to effects and highest value) of the peatland and related habitats IEF is blanket bogs. Wet modified bog and wet heath do have regional value particularly when hydrologically connected to blanket bogs or considering the assemblage as a whole.

Wetlands and related habitats

- 8.53 Wetland habitats are widespread within the survey area. Many of these communities are associated with peatland communities or valley bottoms that are predominantly acidic in nature. These communities are species poor and are widespread locally, regionally, and nationally.
- 8.54 Two wetland communities are of high distinctiveness. Both are types of base-rich springs/flushes that are dependent upon groundwater that have been correspond to the NVC communities M32 *Philonotis fontana* – *Micranthes stellaris* spring and M10 *Carex dioica* – *Pinguicula vulgaris* mire. These communities support a species-rich assemblage, some of which are locally uncommon. Wetlands of high distinctiveness are considered to be of regional importance for nature conservation.

Field Survey Results – Bats

- 8.55 Full details of the results of the bat surveys are provided in Technical Appendix 8.4: Bat Survey report. This appendix includes the results of analysis using the online tool 'Ecobats.'
- 8.56 In summary, at least four species of bats were identified utilising the site;
- Common pipistrelle (*Pipistrellus pipistrellus*);
 - Soprano pipistrelle (*Pipistrellus pygmaeus*);
 - Brown long-eared bat (*Plecotus auritus*); and
 - Myotis spp.
- 8.57 The highest number of bat passes were attributed to common pipistrelle followed by soprano pipistrelle. The location with the most bat passes recorded was L1 (n= 291, 18.9% of the total bat passes) (Appendix 9.4).
- 8.58 Bat pass times indicate that it is unlikely that roosts are located within the site.

Field Survey Results – Otter

- 8.59 The field survey recorded otter spraints on both the Strath Duchally Burn and the River Fiag, confirming the presence of foraging/commuting otter within the survey area. No otter resting places were recorded.

Field Survey Results – Reptiles

- 8.60 Common lizards were recorded in the north of the protected species survey area, in the moorland to the west of the forestry and in a forestry ride in the north of the survey area.
- 8.61 No evidence of the presence of any other protected species was recorded during the protected species survey.

Identification and Evaluation of Key Effects

Construction Effects - Habitats

Predicted direct effects of construction on peatlands and related habitats

- 8.62 The most notable effect of construction on peatlands and related habitats will be direct loss from the footprint of the infrastructure (prior to any habitat reinstatement or restoration). Two broad types of infrastructure will contribute to the footprint of the windfarm: permanent and temporary. Permanent infrastructure such as crane pads, access tracks, substations, etc will remain in place throughout the construction and operational phases. Temporary infrastructure, such as the construction compound and borrow pits, will only be in place for the construction phase.
- 8.63 Temporary infrastructure may result in temporary disturbance of habitats but will be re-instated during the operational phase. In some cases, considerable earthworks will be required for the construction of temporary infrastructure that may result in permanent change or loss of the habitat despite re-instatement. This can be due to a variety of factors, but changes in topography or hydrology to peatlands are rarely likely to lead to full re-establishment of the habitat type.
- 8.64 As blanket bogs are considered to be one of the primary components of the peatland and related habitats IEF in the evaluation of this assessment, a conservative approach to calculating direct loss of peatlands is taken, where losses are considered permanent whether infrastructure is permanent or temporary (Prior to any re-instatement or enhancement). This is justified by the poor reversibility of damage to blanket bog habitats where recovery is long term.
- 8.65 Some sections of the Proposed Development are located on Class 1 peatlands as defined by the NatureScot Carbon and Peatland Map¹⁶. The crane pads for Turbines 7 and 9 are both situated partially within a polygon which has been identified as a Class 1 peatland (See Figure 9.5). Currently, Class 1 peatlands that will be potentially negatively impacted by the Proposed Development are all located within mature commercial forestry plantations or by purple moor-grass *Molinia caerulea* dominated wet modified bog.
- 8.66 As a result, the composition of the vegetation is poor or very poor in these areas. In addition, the peat depth data indicates that there is not a continuous layer of deep peat (>0.5m in depth) throughout the polygon. The condition of deep peat areas will likely have

¹⁶ NatureScot Carbon and Peatland map (2016) Accessed at: <https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/soils/carbon-and-peatland-2016-map>

been compromised due to the activities associated with the commercial forestry plantation such as drying of the soil, drainage, and fertiliser input. Furthermore, there is some degree of inaccuracy within the Class 1 peat maps which show some areas as Class 1 peatland that contains the River Fiag which runs directly over bedrock, where no peat is present, though this particular polygon is not where the infrastructure is proposed.

- 8.67 Further Class 1 peatlands are located within the developable area and lie to the west, immediately adjacent to the Proposed Development. Much of this area is encompassed within the Caithness and Sutherland Peatlands SAC (& Ramsar), Strath Duchally SSSI, Cnoc an Alaskie SSSI and the Flow Country World Heritage Site (WHS). Direct impacts on these have been avoided through the design process by siting infrastructure outwith these areas.
- 8.68 Direct effects involving habitat loss due to land take from permanent infrastructure is detailed in Table 8.5 below. Full details of relevant peatland and related habitats IEF are listed by their respective habitat type (e.g. blanket bog and wet modified bog).

Table 8.5: Permanent Infrastructure habitat loss

Phase 1 code	Habitat type	NVC code	Area of habitat loss (Ha)	% of survey area
A1.2.2	Coniferous plantation woodland	N/A	21.23	2.27
E1.6.1	Blanket bog	M15b, M17b & M19a	0.03	>0.01
E1.7	Wet modified bog	M25	1.34	0.14
J4	Bare ground/tracks	N/A	0.86	0.09
		Total (Ha)	23.46	2.51

- 8.69 As noted in Table 8.5 above, direct loss of blanket bog from the Proposed Development is 0.03Ha or >0.01% of the total survey area. This figure is very small both in relative size and proportion to the overall survey area. It is however important to assess these figures in relation to the overall blanket bog coverage within the site. Direct loss of blanket bog is predicted to be 0.01% of total blanket bog coverage within the Survey Area.
- 8.70 Direct loss of modified bog from the proposed development is predicted to be 1.34Ha or 0.14% of the total survey area. This equates to 1.32% of the total extent of the wet modified bog resource within the survey area.
- 8.71 Additional habitat losses resulting from temporary infrastructure is detailed in Table 8.6 below.

Table 8.6: Temporary Infrastructure habitat loss

Phase 1 code	Habitat type	NVC code	Area of habitat loss (Ha)	% of survey area
A1.2.2	Coniferous plantation woodland	N/A	2.69	0.29

Phase 1 code	Habitat type	NVC code	Area of habitat loss (Ha)	% of survey area
		Total	2.69	0.29

- 8.72 Blanket bog has been almost entirely avoided through the design process, the Proposed Development has however infringed on some very small edges of blanket bog communities that occur in the forest rides. While some of these areas may be hydrologically connected to areas of very high-quality blanket bog, the specific locations of the proposed blanket bog losses are where the vegetation is in transition to poor or very poor-quality stands as a result of the hydrological gradient from the commercial forestry plantation and the increased gradient in the topography. The total habitat loss of blanket bog (prior to re-instatement or enhancement) is 0.03Ha or less than 0.01% of all blanket bog communities identified within the survey area.
- 8.73 The direct loss of 0.02% of total blanket bog habitats within the Survey Area prior to reinstatement and enhancement works is considered to be of a **negligible** magnitude in the long term. As such, direct effects on blanket bogs are considered **not significant**.
- 8.74 The direct loss of 0.14% of wet modified bogs habitats within the Survey Area prior to reinstatement and enhancement works is considered to be of a **negligible** magnitude in the long term. As such, direct effects on wet modified bogs are considered **not significant**.
- 8.75 The direct loss of the both the peatlands (blanket bogs and wet modified bog) equals 0.15% prior to reinstatement and enhancement works, this is considered to be of a **negligible** magnitude. As such, direct effects on peatlands as a whole within the survey area are considered **not significant**.

Predicted indirect effects of construction on peatlands and related habitats

- 8.76 Indirect effects on habitats are expected to occur from the Proposed Development. Indirect effects include temporary disturbance of habitats surrounding permanent and temporary infrastructure, alterations to topography, hydrology, and vegetation composition. Temporary disturbance is expected to occur within the following Zones of Influence (ZOI):
- A precautionary 30m radius surrounding all deeper excavations such as turbine bases and borrow pits, and
 - A 15m radius surrounding all other infrastructure such as access tracks, hardstandings construction compounds and storage areas.
- 8.77 Indirect effects are predicted to be wide ranging and are often difficult to quantify. Disturbance from earthworks surrounding infrastructure will result in temporary disturbance of sensitive habitats occurring in the ZOIs stated above. Reinstatement of habitats is proposed to mitigate for some of this disturbance (Details are provided in the Peat Management Plan and the Outline Habitat Management Plan), however, peatland habitats are often slow to recover. With embedded reinstatement, mitigation and good practice measures recovery is expected in the medium to long term.

8.78 Table 8.7 below details the expected temporary disturbance of habitats within the predicted ZOIs.

Table 8.7 Predicted extent of temporary disturbance on habitats within ZOIs across all infrastructure

Phase 1 code	Habitat type	NVC code	Area of habitat loss (Ha)	% of survey area
A1.2.2	Coniferous plantation woodland	N/A	48.3	5.17
E1.6.1	Blanket bog	M15, M19 & M17	0.26	0.3
E1.7	Wet modified bog	M25	3.65	0.39
J4	Bare ground/tracks		2.71	0.29
		Total	65.62	7.02

8.79 The Proposed Development is expected to cause temporary disturbance to 0.26Ha of Blanket bog. This amounts to >0.1% of blanket bog resource within the Survey Area.

8.80 Blanket bogs considered to be of very high sensitivity have been identified through a combination of the peatland condition assessment and notes gathered in the field regarding vegetation composition, structure, and indicator species. The specific locations of blanket bog lost avoid these areas of high sensitivity and occur where the blanket bog transitions into wet modified bog or coniferous plantation woodland. A total of 0.26Ha of blanket bog will be affected by temporary disturbance.

8.81 The magnitude of the impacts on blanket bog are classed as **negligible**. As such, the impact of temporary disturbance on blanket bog is **not significant**.

8.82 The Proposed Development is expected to cause temporary disturbance 3.65Ha of wet modified bog or 3.59% of the wet modified bog resource within the survey area. Wet modified bog within the survey area is dominated by the NVC M25 *Molinia caerulea-potentilla erecta* community. Most stands are very species poor and dominated by purple moor grass *Molinia caerulea* to the exclusion of most other species.

8.83 The magnitude of the impacts on wet modified bog are classed as **low** prior to mitigation and restoration. Following mitigation measures and proposed restoration of 63Ha of blanket bog within the OHMP, the impact is reduced to **negligible**. As such, the impact of temporary disturbance on blanket bog is **not significant**.

8.84 A total of 1.4% of all peatland communities (blanket bog and wet modified bog combined compared to 377.93Ha of peatland habitats recorded) within the Survey Area will be indirectly affected by the Proposed development. This is categorised as a **Low** magnitude of impact. Following proposed peatland restoration of 62Ha of peatland, the overall impact of indirect effects on the peatland and related habitats IEF is **not significant**.

- 8.85 The oversail area contains one pinch at the junction of the A836 and Manse road in the centre of Lairg (Grid reference: NC 58276 06670). No habitat loss is expected at this location, but the road will need to be kept clear of obstructions. No negative effects upon habitats are predicted along the oversail route.

Temporary disturbance and changes to composition of plant communities resulting from hydrological changes

- 8.86 Predicted hydrological impacts upon surface water is described in detail within Chapter 10. Intact or active blanket bogs communities often have a high-water table, with a water table close to the surface of the substrate (c. 10cm from the surface).
- 8.87 A high-water table in blanket bogs is essential for peat formation due to the ecological niches that the dominant peat forming Sphagnum require. Blanket bogs can cover large areas that are hydrologically connected, any changes to the hydrological mechanisms can impact the community as a whole.
- 8.88 Changes to hydrology including disturbance of the peat substrate, pollution, or alteration to surface or groundwaters can occur during the construction phase for a variety of reasons including:
- Physical disturbance of peat substrate from construction of infrastructure
 - Dewatering activities leading to a reduction in groundwater levels
 - Disruption to flow paths or changes to drainage regimes during construction (and operation) can lead to increases in run-off and a lowering of the water table
 - Pollution events from construction, operation and decommissioning activities which can contaminate surface waters
 - Pollution from increased sediment load during construction and operation.
- 8.89 Through the implementation of good practice measures as set out in the SEPA GPPs the risk of pollution events or contamination from increased sediment load to surface waters are minimised.
- 8.90 Considering the specific location of the blanket bogs potentially lost in relation to the proposed development. They are in a situated where they are in vegetational transition to other communities such as wet modified bog (NVC M25 *Molinia caerulea* – *Potentilla erecta* mire) and commercial forestry plantations. This transition has manifested itself by the increased frequency of indicators of poor quality including *Molinia caerulea* and a fewer Sphagnum species.
- 8.91 If no reinstatement or mitigation works are carried out, increased surface run-off may result from the installation of drainage features. This could lead to a lowering of the water table within connected blanket bog communities. Taking consideration of the degraded nature of the blanket bog communities potentially lost which is mainly due to the specific location within commercial forestry plantation and subsequent hydrological degradation resulting from this, proposals are predicted to increase surface run-off prior to mitigation and reinstatement works. Implementation of procedures such as following SEPA GPPs will ensure integrity of blanket bog connected to the areas lost will not be compromised.

8.92 Blanket bog areas potentially lost through the Proposed Development are situated at a lower altitude on a steep slope beneath the main body of blanket bog to which it is connected. As hydrological changes are largely going to negatively affect areas of blanket bog downstream (which is not present in this particular instance) rather than upstream. Negative impacts such as pollution events predicted upon the wider blanket bog community are considered to be **negligible**. Implementing good practice measures mentioned above are followed, will further safeguard blanket bog communities, particularly those within the Strath Duchally SSSI and Caithness and Sutherland Peatlands SAC & Ramsar. Potential impacts upon these designated sites are described in more detail in section 'Predicted indirect effects of construction on designated sites' below.

8.93 Impacts as a result of hydrological changes to blanket bog communities are considered to be **not significant**.

Summary of construction effects on peatlands and related habitats

8.94 The main potential effects from the Proposed Development are predicted to be:

- Direct loss of **0.03Ha** of blanket bog
- Indirect effects to **0.26Ha** of blanket bog
- Direct loss of **1.34Ha** of wet modified bog
- Indirect effects of **3.65Ha** wet modified bog

8.95 The combined total of direct and indirect losses of blanket bog and wet modified bog combined amounts to **5.28Ha**.

8.96 Impacts on peatland and related habitats, and their individual constituent parts are considered **negligible** and not significant.

8.97 However, following proposed mitigation and peatland restoration measures, a **moderate, long-term positive effect** is predicted.

8.98 No negative effects upon habitats are predicted upon habitats along the oversail route.

Predicted direct effects of construction on designated sites (Caithness and Sutherland Peatlands Special Area of Conservation Caithness and Sutherland Peatlands RAMSAR, Strath an Loin SSSI, Cnoc an Alaskie SSSI & Strath Duchally SSSI)

8.99 This part of the assessment has followed guidance as set out in the Habitats Regulations Assessment¹⁷. This involves evaluating whether the Proposed Development is likely to compromise the integrity of the designated features.

8.100 Within a 5km radius from Developable boundary, there are five sites (occupying three broad areas) designated for habitats (See Figure 8.1). These are detailed in Table 8.8 below.

¹⁷ NatureScot (2024) Habitats Regulations Appraisal (HRA). Accessed at: <https://www.nature.scot/professional-advice/planning-and-development/environmental-assessment/habitats-regulations-appraisal-hra>

Table 8.8: Designated sites and their relation to the Proposed Development

Site Name	Designation	Distance and location	Citations	Comments
Flow Country	WHS	Immediately adjacent to west	• Blanket bog and peatland habitats	One section of the WHS occurs within the Developable Area. Infrastructure has avoided direct impacts upon this feature. Direct and indirect impacts are considered to be negligible and not significant
Caithness and Sutherland Peatlands	SAC	Immediately adjacent to west	• Blanket bog • Depressions on peat substrates • Natural dystrophic lakes and ponds • Northern Atlantic wet heaths with <i>Erica tetralix</i> • Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels • Marsh saxifrage • Transition mires and quaking bogs	One section of this SAC occurs within the Developable Area. Infrastructure has avoided direct impacts upon this feature. Direct and indirect impacts are considered to be negligible and not significant
Caithness and Sutherland Peatlands	RAMSAR	Immediately adjacent to west	• Blanket bog • Mire • Oligotrophic lochs • <i>Sphagnum lindbergii</i> • <i>Sphagnum majus</i> • Bog orchid • <i>Hammarbya paludosa</i> • <i>Oreodytes alpinus</i> • Otter <i>Lutra lutra</i> • Freshwater pearl mussel <i>Margaritifera margaritifera</i>	One section of this RAMSAR occurs within the Developable Area and occupies the same area as the SAC detailed above. Infrastructure has been sited to avoid direct impacts upon this feature. Direct and indirect impacts are considered to be negligible and not significant
Strath Duchally	SSSI	Immediately adjacent to west	Blanket bog	Direct effects have been avoided by siting infrastructure beyond the designated area boundaries

Site Name	Designation	Distance and location	Citations	Comments
				Indirect impacts are considered to be negligible
Cnoc an Alaskie	SSSI	c. 1.2km to the north-east	Blanket bog	Due to the separation distance, topography location, no direct or indirect effects are considered likely
Strath an Loin	SSSI	c. 1.8km to the south	Blanket bog	Due to the separation distance, topography location, no direct or indirect effects are considered likely

- 8.101 The Caithness and Sutherland Peatlands Special Area of Conservation is a large area covering designated for several qualifying interest as listed in the table above. One section of the SAC lies immediately adjacent to the Strath Duchally SSSI boundaries and lies within the Developable Area. Another section of the SAC which corresponds to the Cnoc an Alaskie SSSI is located to the north and east of the survey area and is situated approximately 1.2km from the survey area at its closest point. The location of the designated sites in relation to the proposed development can be found in Figure 8.1.
- 8.102 Strath Duchally SSSI is designated for one habitat type (blanket bogs) and several bird species. During the last round of monitoring, the condition of the blanket bog within Strath Duchally SSSI was described as 'Favourable, maintained'¹⁸.
- 8.103 Part of this SSSI is located within the northwest of the site, but outwith the footprint of the development. Blanket bog was recorded as being widespread within the area of the SSSI which lies within the survey area (Technical Appendix 8.1). The condition of blanket bog varied throughout the survey area from near natural to actively eroding. Using the criteria for guidelines for the selection of SSSIs, areas of blanket bog are considered to be of national importance.
- 8.104 Due to some areas being classed as nationally important and being of high sensitivity, the proposed development has sited infrastructure to avoid all blanket bog communities within the Caithness and Sutherland Peatlands SAC & Strath Duchally SSSI boundaries which are both within the Development Area.
- 8.105 As a result, no direct impacts are predicted. The effect is therefore **not significant** for Caithness and Sutherland Peatlands SAC (& Ramsar) and Strath Duchally SSSI.
- 8.106 Due to the distance, habitats, and topography between the Proposed Development and the Cnoc an Alaskie SSSI and that particular section of the Caithness and Sutherland Peatlands SAC (& RAMSAR), there is no pathway for direct effects identified within this

¹⁸ NatureScot Sitelink (2024) Strath Duchally SSSI. Accessed at: <https://sitelink.nature.scot/site/1489>

assessment. As such, direct impacts and are considered to be **not significant** for Cnoc an Alaskie SSSI and the Caithness and Sutherland Peatlands SAC (& Ramsar).

- 8.107 It is concluded that the Proposed Development will not negatively affect any of the identified designated sites or the integrity of the citations for which they are designated. Following proposed mitigation and peatland restoration measures, a moderate positive long-term effect is predicted for Strath Duchally SSSI and a small positive long-term on the Caithness and Sutherland SAC & Ramsar.

Predicted indirect effects of construction on designated sites (Caithness and Sutherland Peatlands SAC & RAMSAR, Strath an Loin, Cnoc an Alaskie SSSI & Strath Duchally SSSI)

- 8.108 Two paths for hydrological connectivity between peatlands proposed to be lost from the Proposed Development and the peatlands within the Caithness and Sutherland Peatlands SAC (& RAMSAR), the Flow Country WHS and the Strath Duchally SSSI.
- 8.109 There may also be some hydrological connectivity between the peat soils between the designated areas through the forestry plantation (which contains peat soils) and the proposed area of blanket bog to be lost. Trees reduce moisture levels from peat soils and create a hydrological gradient in the water table. The flow of water is further disrupted through these areas due to drainage ditches which diverts the flow of water and will reduce connectivity. It is considered that hydrological connectivity through the peat soils in the plantation are considered **negligible**.
- 8.110 There is also a continuous, narrow strip of blanket bog with a peat layer extending from the blanket bog recorded in the designated sites down two commercial forestry plantation rides where the very edges of blanket bog polygons are proposed to be lost from permanent infrastructure. The potential impacts regarding hydrological changes between these areas have been detailed in the 'Temporary disturbance and changes to composition of plant communities resulting from hydrological changes' section above.
- 8.111 In summary, due to the specific location of the blanket bog proposed to be impacted, their condition and the magnitude of potential hydrological changes, indirect effects involving hydrological changes as a result of the proposed development are considered **negligible**. As a result, indirect impacts and are **not significant** for both the Caithness and Sutherland Peatlands SAC and Strath Duchally SSSI.
- 8.112 Due to the distance, habitats, and topography between the Proposed Development and the Cnoc an Alaskie SSSI and that particular section of the Caithness and Sutherlands SAC, there is no pathway for indirect effects identified within this assessment. As such, indirect impacts and are considered to be **not significant**
- 8.113 It is considered therefore that the integrity of each of the designated sites will be maintained. Following offsetting and enhancement work which is proposed to restore 50Ha of actively eroding blanket bog within Strath Duchally SSSI and Flow Country WHS in replacement (at a ratio of 1:10) for what is predominantly purple moor-grass *Molinia caerulea* dominated wet modified bog proposed to be lost as part of the proposals, it is predicted that the integrity of Strath Duchally SSSI, and the relevant sections of the

Caithness and Sutherland Peatlands SAC (& RAMSAR) will be improved. A moderate positive effect is predicted in the long-term.

Predicted direct effects of construction on Wetlands and related habitats

- 8.114 The habitat surveys identified two communities that are of high distinctiveness, both of which are Groundwater Dependent Terrestrial Ecosystems (GWDTEs). Through the design process, these have been avoided and are beyond the 250m Zone of Influence and buffer distances recommended by SEPA¹⁹ from proposed infrastructure.
- 8.115 Considering the separation distance between the proposed excavations, topographical and hydrological settings mean that the risk of direct effects are considered to be a **negligible** magnitude. Taking the embedded mitigation measures into account, the impact of direct effects from the Proposed Development are **not significant**.

Predicted indirect effects of construction on wetlands and related habitats

- 8.116 Considering the separation distance between the proposed deep excavations and other construction related activities, topographical and hydrological settings mean that the risk of indirect effects are considered to be **negligible**. Indirect effects on wetlands and related habitats are deemed **not significant**.

Construction Effects - Species

Construction impact: otter and pine marten direct mortality due to construction activities

- 8.117 The construction of the wind farm will require the movement of heavy plant and machinery. During the operation phase vehicular access may be required to maintain or manage the windfarm.
- 8.118 In the absence of mitigation increased vehicular movements and plant operation has the potential to result in direct mortality of these species due to road traffic accident (RTA) with site vehicles or animals becoming trapped in excavations.
- 8.119 This effect is temporally limited to the construction period. The effect would be permanent in terms of any individual animals, but is considered to be negligible in terms of the regional populations of these species.
- 8.120 The effect is considered to be a negative significant effect; significant only at a Local (site) level.

¹⁹ SEPA (2017) Land Use Planning System SEPA Guidance Note 31 – Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems

Operational Effects

- 8.121 Beyond the effects identified with respect to construction, no further direct loss of habitat or degradation is anticipated during the operational phase of the Proposed Development. Therefore, no further impacts are predicted.
- 8.122 Furthermore, no additional indirect effects other than those identified during the construction phase are expected upon peatland communities or other habitats during the operational phase. Providing good practice measures are adhered to, pollution or sedimentation events are considered negligible and reversible during maintenance work.

Bats direct mortality due to collision.

- 8.123 Bats species considered to be at 'high' collision risk²⁰ were recorded using the site, in particular common and soprano pipistrelle bats. These species were noted at static detector locations 1, 7 and 9 (in proximity of proposed turbines 15, 2 and 12 and 14 respectively). Studies have shown that where clear felling has been used in forestry, edge foraging bat species (which includes pipistrelle bats) use of the area has increased^{21,22}.
- 8.124 Both common and soprano pipistrelles are considered to be 'common' species¹⁸. In Scotland, both species are considered to have a stable population with a widespread distribution²³. The current population estimates for common pipistrelle 875,000 and for soprano pipistrelles it is 1,210,000²¹ as such, these populations are of medium vulnerability to collision²⁰. This effect is, therefore, is considered to be a negative significant effect; significant only at a Local (site)level.

Bats direct effect of habitat loss – felling operations.

- 8.125 Clear felling to facilitate the proposed development will result in the loss of habitat for narrow/ closed habitat foragers such as brown long eared bats and myotis spp²⁰. In addition, these species may be displaced from a wider area extending beyond the felled area which may be as a result of operational noise²⁰. This effect is, therefore, is considered to be a negative significant effect; significant only at a Local (site)level.

Bats direct effect of habitat creation – felling operations.

- 8.126 Conversely, the felling of spruce plantation may result in increased foraging by edge and open space foraging bat²⁰. Pipistrelle bats are edge foraging species, and the works may increase activity within the plantation¹⁹. This is not considered to be a significant effect.

²⁰ NatureScot (Scottish Natural Heritage), Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, The University of Exeter & Bat Conservation Trust (BCT) (2021). Bats and onshore wind turbines – survey, assessment, and mitigation [online] Available at: <https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation>

²¹ Kirkpatrick, L., Oldfield, I.F., and Park, K. (2017) Responses of bats to clear fell harvesting in Sitka Spruce plantations and implications for wind turbine installation. *Forest Ecology and Management*. 395, pp1-8.

²² Ellerbrok, J.S., Farwig, N., Peter, F., Rehling, F., and Voigt, C.C. (2023) Forest gaps around wind turbines attract bat species with high collision risk. *Biological Conservation*. 288. 110347.

²³ Bat Conservation Trust (2024) The national bat monitoring programme annual report 2023. Bat Conservation Trust, London. [online]. Available at: <http://bats.org.uk/our-work/national-bat-monitoring-programme/reports/nbmp-annual-report>.

Decommissioning Effects

- 8.127 Potential effects during the decommissioning of the Proposed Development would be of a similar nature to those identified during the construction and operational phases. As the Proposed Development timeline spans 35 years, any new legislation and guidance prior to decommissioning will be adhered to.

Mitigation Measures and Monitoring

- 8.128 Generic mitigation measures that would apply during construction and operational phases are outlined below. The following measures represent general best practice and would reduce potential effects on a number of receptors:
- Not more than 16 weeks prior to construction of the Proposed Development and within the correct survey season, the Applicant will engage a Suitably Qualified Ecologist (SQE) to undertake a series of repeat ecological surveys to update the baseline data.
 - The aim of the repeat ecological surveys will be to provide up to date information in order to confirm required mitigation, including the need for protected species licensing and species protection plans for the site. The result of the pre-construction surveys will be communicated to the Contractor by the SQE and will be fed into the CEMP. The recommendations will ensure compliance with the necessary wildlife legislation.
 - Adherence to SEPA Guidance on Pollution Prevention (GPP) in respect to working in and around watercourses.
 - Adherence to NatureScot (formally SNH) guidance on upland track construction
 - All vehicles will be restricted to 5mph while within 100m of watercourses and 15mph within the wider site.
 - Avoidance of unnecessary disturbance to habitats by minimising the extent of vegetation clearance and other construction practices.
 - Restriction of plant and personnel to a prescribed working corridor through the use of temporary barriers or fences, minimising damage to habitats and potential direct mortality and disturbance to species.
 - Adherence to best practice guidance with respect to culvert and bridge design.
 - Any trenches dug during construction and decommissioning operations will be covered at the end of each day to prevent mammals becoming trapped. Alternatively, mammal ramps will be positioned in such a way that trapped mammals may be allowed to escape.
 - All exposed pipes and trenches will be checked each morning prior to starting construction activities. If trapped animals are found, the SQE will be contacted.
- 8.129 Ecological toolbox talks will be provided to all new site staff on the potential presence of protected species and any measures that need to be undertaken.

Construction

- 8.130 The Proposed Development has sought to implement the mitigation hierarchy in relation to the effects on habitats through the design process. Embedded mitigation has been largely effective in implementing avoidance of IEFs.
- 8.131 An Outline Habitat Management Plan (OHMP) and an Outline Peat Management Plan (OPMP) (EIA Volume 4, Technical Appendix 10.3) details the proposed mitigation and enhancement measures designed to reduce negative impacts. In summary, these proposals include:
- Monitoring of deer numbers to inform the requirement for any reduction of grazing through deer management.
 - Peatland restoration of suitable areas involving hag re-profiling (50Ha of potentially suitable areas are shown in Figure 8.4).
 - Translocate any surplus excavated peat within the Developable Area.
 - Not re-stocking sections of commercial forest plantation that are proposed to be felled

Bats

- 8.132 A minimum of 50m buffer distance will be applied from the turbines to the edge of the woodland including those woodland edges created from felling. The 50m distance is from blade tip and is calculated using the formula provided in the NatureScot guidance document¹⁸.
- 8.133 In addition, the following measures should be implemented:
- Should any suitable features for roosting bats or bat roosts be identified within 30 m of any working areas or 200m of turbine locations, during the preconstruction surveys or during construction, all works will cease until the ECoW is contacted for advice. It may be necessary to obtain a licence from NatureScot.
 - All site lighting (if required) will be directed to the area required and light spill minimised. No lighting of woodland edges or tree/structures with suitable features should be undertaken.

Operation

- 8.134 Monitoring of the proposed mitigation and enhancement activities outlined above will be carried out to measure effectiveness during the lifespan of the windfarm (35 years). There is currently not a strict timeline for the peatland restoration proposals, though these should be carried out during either construction phases or at the beginning of the operational phase.

Decommissioning

- 8.135 During the decommissioning of the Proposed Development, potential effects on IEFs will be similar to those during the construction phase. Similar measures to minimise impacts will

be employed but will use any updated published guidance or legislation which will be incorporated into the relevant management plan/s prior to decommissioning.

Cumulative Effects

- 8.136 In line with NatureScot's guidance on cumulative assessment in relation to wind farms²⁴, this assessment process focuses upon the likely significant impacts. Cumulative impacts are considered at the Caithness and Sutherland Peatlands Natural Heritage Zone area.
- 8.137 In this case, the Caithness and Sutherland Peatlands SAC & Ramsar designated sites IEF are considered to be the most likely to be negatively affected from significant impacts. However, two peatland habitats are also considered separately, these are Blanket bog and wet modified bog.
- 8.138 In order to evaluate whether a cumulative impact on the Caithness and Sutherland SAC & Ramsar is likely, a search for information relating to all wind farms (consented, constructed and in planning) within a 2km distance (considered an appropriate ZOI) from the designated IEF. Unfortunately, information was not available for all sites. A summary of each site (where information was publicly available) and their predicted impact upon the Caithness and Sutherland SAC & Ramsar is provided in table 8.9 below.

Table 8.9 Wind farm developments and predicted impacts upon the Caithness and Sutherland Peatlands SAC & Ramsar

Site Name	Status	Predicted effects	Type of effect
Achany Extension Wind Farm	Approved	Non-technical summary states that significant effects for blanket bog were predicted. Following habitat management and restoration, no significant residual effects are predicted. No specific reference to impacts to the Caithness and Sutherland SAC & Ramsar are provided within the Non-technical summary. The full Achany EIA Report could not be found.	N/A
Creag Riabhach Extension Wind Farm	In Planning	Negligible impact on Caithness and Sutherland SAC & Ramsar - not significant Significant positive effect of a medium magnitude reported following habitat restoration	Positive
Golticlay Wind Farm	Approved	Negligible - not significant residual effect on Caithness and Sutherland SAC & Ramsar after embedded mitigation	Negligible
Golticlay Redesign Wind Farm	In Planning	Beneficial long-term impact on blanket bog at a regional level Beneficial long-term impact on Caithness and Sutherland SAC & Ramsar after embedded mitigation	Positive
Gordonbush Extension Wind Farm	Constructed	Minor residual significant impact on blanket bog. No residual negative effects on the Caithness and Sutherland SAC & Ramsar are predicted following mitigation measures	Negligible

²⁴ SNH (2012). Guidance - Assessing the cumulative impact of onshore wind energy developments. Available at: <https://www.nature.scot/guidance-assessing-cumulative-impact-onshore-wind-energy-developments>.

Site Name	Status	Predicted effects	Type of effect
Halsary Wind Farm	Constructed	Non-technical summary states that a major significant beneficial effect in the long-term following embedded mitigation.	Positive
Melvich Wind Energy Hub	In Planning	Moderate beneficial effect on blanket bog and wet modified bog following upon implementation of HMP and restoration. Effects on Caithness and Sutherland SAC & Ramsar scoped out	N/A
Sallachy Wind Farm 2nd Submission	Approved	Non-technical summary states that no-significant effects on peat receptors are anticipated. Full ecology chapter of EIA not found. No reference to impacts on the Caithness and Sutherland SAC & Ramsar are described	N/A
Shinness Wind Farm	In Planning	No negative impacts are predicted on Caithness and Sutherland SAC & Ramsar. Beneficial impacts from restoration and enhancement are predicted following implementation	Positive
Strathy Wood Wind Farm	Approved	Moderate significant residual impact on Caithness and Sutherland SAC & Ramsar Minor residual significant impact on blanket bog	Negative
Tormsdale Wind Farm	In Planning	Following embedded mitigation, negligible negative effect on the Caithness and Sutherland SAC & Ramsar are predicted.	Negligible
Watten Wind Farm	In Planning	Minor negative, not significant on blanket bog. Effects on the Caithness and Sutherland SAC were scoped out	N/A

- 8.139 Information was found for twelve sites that could have potential adverse effects upon the Caithness and Sutherland SAC & Ramsar. Of this total, four sites scoped out potential effects on this IEF and so were not assessed. Positive effects were predicted for four sites, negative effects were predicted for one site (Strathy Wood) and the remainder were negligible. The predicted effect following embedded mitigation for Coille Linne wind farm is predicted to be positive. As a result of this review, a cumulative effect on the Caithness and Sutherlands SAC & Ramsar is not considered to result in a significant negative impact.
- 8.140 Considering the mitigation proposals that involve restoring 62Ha of blanket bog, which is a key component of the peatland and related habitats IEF and the predicted moderate positive effect in the long-term, cumulative impacts are evaluated as being **not significant**.
- 8.141 Similarly, with both blanket bog and wet modified bog, no measurable negative impacts have been identified during the assessment process. The impact has been classified as **not significant**. The proposed development will therefore not contribute to any cumulative impact and the potential impacts on blanket bog and wet modified bog communities are considered **not significant**.

Residual Effects

Construction

- 8.142 Mitigation measures have been outlined in the OHMP, these involve (but are not limited to) the restoring approximately 62Ha of blanket bog. NatureScot currently recommends a ratio of 1:10 for the area of peatland lost to that which is restored. A combined loss (including direct and indirect effects equals 5.28Ha of blanket bog and wet modified bog would therefore require a minimum restoration area of 52.8Ha. The OHMP has proposed an area of restoration of approximately 62Ha, which exceeds the recommended ratio of blanket bog lost to that which is proposed for peatland restoration.
- 8.143 Peatland and related habitats within the Survey Area have been identified as an IEF of national importance. Primarily through avoidance, but also through the implementation of embedded mitigation, direct and indirect effects are considered to have a **negligible** impact, and the effect is **not significant**.
- 8.144 The primary IEF of wetlands and related habitats within the Survey area is the two identified GWDTE communities (NVC communities: M10 & M32). These communities are widespread throughout the Highland region²⁵. Taking into consideration the mitigation measures (avoidance, topographical and hydrological details), a negligible magnitude is predicted, and the effect is **not significant** on wetlands and related habitats.
- 8.145 Following the implementation of peatland restoration measures, a moderate positive effect is predicted for peatlands, the Strath Duchally SSSI and the relevant section of the Caithness and Sutherland SAC & Ramsar.

Operation

- 8.146 Beyond the effects identified with respect to construction, no further effects are predicted.

Bats

- 8.147 The low risk of direct mortality of bats cannot be mitigated and as such there remains a negative significant effect only at a Local (site) level.
- 8.148 Compensatory planting to ameliorate the loss of foraging habitat would, in the medium to long term provide new foraging areas for bats.

Decommissioning

- 8.149 Beyond the effects identified with respect to construction, no further effects are predicted.

²⁵ Averis, A., Averis, B., Birks, J., Horsfield, D., Thompson, D. & Yeo, M. (2014) An Illustrated Guide to British Upland Vegetation, JNCC, Peterborough, ISBN 1 86107 553 7.

Summary

8.150 Table 8.10 below summarises the effects on key receptors, together with any mitigation measures and residual effects.

Table 8.10: Summary of Effects

Receptor	Sensitivity	Predicted Impact Characterisation	Significance before mitigation	Summary of Mitigation	Residual Effect
Construction Phase					
Peatlands and related Habitat	National Importance	Direct habitat loss of 0.03Ha of Blanket bog	Negligible impact.	Generic Mitigation	Moderate positive, long-term.
		Direct habitat Loss of 1.34Ha of wet modified bog	Not significant at a national level.	Outline Habitat Management Plan (OHMP). Outline Peat Management Plan Reduction of grazing through deer management 62Ha of peatland restoration Translocate any surplus excavated peat within the Development Area. Not re-stocking some areas of commercial forestry plantation adjacent to designated areas	
		Indirect effect of construction to 0.26 Ha of blanket bog	Low impact.	Generic Mitigation	Moderate positive, long-term.
		Indirect effect of construction to 3.65Ha of wet modified bog	Not significant at a national level.	Outline Habitat Management Plan (OHMP). Outline Peat Management Plan Reduction of grazing through deer management 62Ha of peatland restoration Translocate any surplus excavated peat within the Development Area.	

Receptor	Sensitivity	Predicted Impact Characterisation	Significance before mitigation	Summary of Mitigation	Residual Effect
				Not re-stocking some areas of commercial forestry plantation adjacent to designated areas	
		Combined effects on blanket bog and wet modified bog	Low magnitude. Not significant at a national level	Generic Mitigation Outline Habitat Management Plan (OHMP). Outline Peat Management Plan Reduction of grazing through deer management 62Ha of peatland restoration Translocate any surplus excavated peat within the Development Area. Not re-stocking some areas of commercial forestry plantation adjacent to designated areas	Moderate positive, long-term.
Caithness & Sutherland Peatlands SAC and Flow Country WHS	International importance	Change to hydrological connectivity.	Negligible impact. Not significant at a national level.	Generic Mitigation Outline Habitat Management Plan (OHMP). Outline Peat Management Plan Reduction of grazing through deer management 62Ha of peatland restoration Translocate any surplus excavated peat within the Development Area. Not re-stocking some areas of commercial forestry plantation adjacent to designated areas	Small positive, Long-term.
Caithness & Sutherland Peatlands RAMSAR	National Importance	Change to hydrological connectivity	Negligible impact.	Generic Mitigation	Small positive, Long-term.

Receptor	Sensitivity	Predicted Impact Characterisation	Significance before mitigation	Summary of Mitigation	Residual Effect
			Not significant at a national level.	Outline Habitat Management Plan (OHMP). Outline Peat Management Plan Reduction of grazing through deer management 62Ha of peatland restoration Translocate any surplus excavated peat within the Development Area. Not re-stocking some areas of commercial forestry plantation adjacent to designated areas	
Strath Duchally SSSI	National Importance	Change to hydrological connectivity	Negligible impact. Not significant at a national level.	Generic Mitigation Outline Habitat Management Plan (OHMP). Outline Peat Management Plan Reduction of grazing through deer management 62Ha of peatland restoration Translocate any surplus excavated peat within the Development Area. Not re-stocking some areas of commercial forestry plantation adjacent to Strath Duchally SSSI	Moderate positive, long-term.
Strath an Loin SSSI	National Importance	Change to hydrological connectivity	Negligible impact. Not significant at a national level	Generic Mitigation Outline Habitat Management Plan (OHMP). Outline Peat Management Plan	Negligible impact. Not significant.

Receptor	Sensitivity	Predicted Impact Characterisation	Significance before mitigation	Summary of Mitigation	Residual Effect
				Reduction of grazing through deer management 62Ha of peatland restoration Translocate any surplus excavated peat within the Development Area.	
Cnoc an Alaskie SSSI	National Importance	Change to hydrological connectivity	Negligible impact. Not significant at a national level	Generic Mitigation Outline Habitat Management Plan (OHMP). Outline Peat Management Plan Reduction of grazing through deer management 62Ha of peatland restoration Translocate any surplus excavated peat within the Development Area	Negligible impact. Not significant.
GWDTEs – M10 & M32 Communities	Regional Importance	Indirect effect of construction	Negligible impact. Not significant at a regional level	Generic Mitigation Outline Habitat Management Plan (OHMP). Outline Peat Management Plan Reduction of grazing through deer management Peatland restoration of 62Ha Translocate any surplus excavated peat within the Development Area	Negligible impact. Not significant.
Wetlands and related Habitats	Regional Importance	Indirect effect of construction	Negligible impact.	Generic Mitigation	Negligible impact. Not significant.

Receptor	Sensitivity	Predicted Impact Characterisation	Significance before mitigation	Summary of Mitigation	Residual Effect
			Not significant at a regional level.	Outline Habitat Management Plan (OHMP). Outline Peat Management Plan Reduction of grazing through deer management Peatland restoration of 62Ha Translocate any surplus excavated peat within the Development Area	
Operational Phase					
Bats	Local Importance	Direct Mortality	Negligible impact. Significant at local level		Negative impact significant at local level.
		Foraging habitat loss	Negligible impact. Significant at local level	Compensation planting to provide additional foraging areas	Negligible impact in the medium to long term.

Coille Linne Wind Farm

Environmental Impact Assessment Report Volume 1 Chapter 9: Ornithology

June 2025

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9 ORNITHOLOGY

Introduction

- 9.1 This chapter considers the potential effects of Coille Linne Wind Farm (the Proposed Development) on Ornithology.
- 9.2 It is supported by the following figures as contained within Volume 2: Figures:
- Figure 9.1 a-c – Site and Designated Sites
 - Figure 9.2 – Ornithology Survey Areas
 - Figure 9.3 – Vantage Point Viewsheds
 - Figure 9.4 – Breeding Bird Survey Results 2023
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 - Figure 9.6a – Raptor Flights
 - Figure 9.6b – Other Species Flights
 - Figure 9.7 – **CONFIDENTIAL** Ornithology Results
- 9.3 The chapter is also supported by a number of Technical Appendices (as set out within Volume 4: Technical Appendices), comprising:
- Technical Appendix 9.1: Ornithology Technical Appendix
 - Technical Appendix 9.2: Collision Risk Modelling
 - Technical Appendix 9.3: Confidential Annex
 - Technical Appendix 9.4: Golden Eagle Topography (GET) Model Report
 - Technical Appendix 8.3: Outline Habitat Management Plan
- 9.4 Ornithology survey results are included in full in the chapter.
- 9.5 Other relevant chapters include Chapter 8: Ecology, Chapter 11: Noise and Chapter 14: Forestry.
- 9.6 The author of this Chapter, Simon Zisman BSc (Hons) MSc, PhD, has 25 years of relevant experience in the assessment of wind farm effects on birds in Scotland and in the preparation of EIA Reports and Habitats Regulations Assessments (HRA) for a range of onshore wind farms in the Highlands. Liaison on overall approach and review has been undertaken by Colin Nisbet MSc, BSc, MCIEEM – Director (WildLife Consulting Ltd). Colin has 18 years' experience in ecological consultancy.
- 9.7 The aims of this assessment are as follows:
- Consider relevant legislation, policy, and guidance;
 - Assess baseline data from desk-studies and site surveys to establish the existing ornithological interests on site and within the relevant survey buffers;

- Assess potential direct and indirect effects from the Proposed Development and the ornithological significance of these effects;
- Identification of cumulative effects with other relevant developments;
- Identification of appropriate measures for avoidance and mitigation of potentially adverse effects from the Proposed Development;
- Identification of residual, significant effects from the Proposed Development following mitigation;
- Provide sufficient information for the Appropriate Authority to carry out a Habitat Regulations Assessment (HRA) of the impact of the proposed development, to it does not cause an adverse effect on the integrity of Special Protection Areas (SPAs), alone or in combination with other plans or projects.

Legislation, Policy and Guidance

- 9.8 Relevant legislation, policy and guidance has been consulted to inform the assessment of impacts. A list of pertinent documents is provided below. Where specific documents have been consulted, these are referenced in the relevant section.
- 9.9 For the sake of clarity, it is worth noting that Scottish Natural Heritage (SNH) was rebranded as NatureScot on 24th of August 2020. Guidance documents or consultations carried out before the name change may refer to the original SNH name.

Legislation

- 9.10 The main legislation that has been considered for this ornithological assessment is listed below:
- The Council Directive on the Conservation of Wild Birds 2009/147/EC (the Birds Directive);
 - The Council Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora 92/43/EEC (The Habitats Directive);
 - The Conservation (Natural Habitats, &c) Regulations 1994 (as amended) ('The Habitats Regulations');
 - The Environmental Impact Assessment Directive 2014/52/EU (the EIA Directive);
 - The Wildlife and Countryside Act 1981 (as amended);
 - The Nature Conservation (Scotland) Act 2004 (as amended);
 - Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.
 - The Wildlife and Natural Environment (Scotland) Act 2011;
 - Environmental Impact Assessment Directive; and
 - The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

Policy

- 9.11 Chapter 5: Renewable Energy and Planning Policy of the EIA Report sets out the planning policy framework that is relevant to the EIA process and the proposed development. The

policies set out include those from the Highland Council Local Development Plan (LDP) relevant aspects of the 2023 National Planning Framework 4(NPF4), Planning Advice Notes and other relevant guidance. The key relevant policies relating to the ornithology policy are:

- NPF4: Policy 3 - Biodiversity;
- UK Post-2010 Biodiversity Framework (2012);
- Scottish Government (2017) Planning Advice Note 1/2013-Environmental Impact Assessment, Revision 1.0;
- Scottish Government (2000) PAN 60: Planning for Natural Heritage;

Guidance

9.12 The key guidance and references used to inform the ornithological assessment for the proposed development were:-

- CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Chartered Institute of Ecology and Environmental Management (CIEEM);
- European Commission (2011) NatureScot Guidance: Assessing the cumulative impact of onshore wind energy developments;
- European Commission (2011) Wind Energy Developments and Natura 2000;
- Gilbert *et al.* (1998) Bird Monitoring Methods; A Manual of Techniques for UK Key Species. RSPB, Sandy, Bedfordshire;
- Goodship and Furness (2022) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species;
- Hardey *et al.* (2013) Raptors: a field guide to survey and monitoring;
- Ruddock and Whitfield (2007) A Review of Disturbance Distances in Selected Bird Species;
- SNH (2000) Windfarms and birds: calculating a theoretical collision risk assuming no avoidance action;
- SNH (2016a) Assessing connectivity with Special Protection Areas (SPAs);
- SNH (2016b) Environmental Statements and Annexes of Environmentally Sensitive Bird Information; Guidance for Developers, Consultants and Consultees;
- SNH (2017) Recommended bird survey methods to inform impact assessment of onshore wind farms;
- SNH (2018a) Assessing significance of impacts from onshore wind farms on birds out with designated areas;
- SNH (2018b) Assessing the cumulative impacts of onshore wind farms on birds; and
- SNH (2018c) Environmental Impact Assessment Handbook.
- SNH Guidance (2018d): Use of avoidance rates in the SNH wind farm collision risk model (2010, update 2018);
- SNH (2020) The Scottish Biodiversity List (SBL);
- NatureScot (2025) Guidance on using an updated collision risk model to assess bird collision risk at onshore wind farms (up-dated 17th March 2025);

- Stanbury *et al.* (2021) Birds of Conservation Concern (BoCC) 5: The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain.

9.13 Additional sources of information used are referenced in the text where relevant.

Assessment Methodology and Significance

Scope of Assessment

Consultation

- 9.14 As part of the Scoping exercise, key stakeholders were consulted. Feedback was used to inform the design of the proposed development and agreement was sought on the scope of the Environmental Impact Assessment (EIA) Report and the HRA.
- 9.15 The Scoping Opinion was received from the Energy Consents Unit/Scottish Ministers on 20th September 2024.
- 9.16 Consultation relevant to this ornithology assessment was undertaken with NatureScot and the Royal Society for the Protection of Birds (RSPB). Whilst the latter did not respond, NatureScot commented on aspects of methodology, sources of information, scope of assessment and cumulative development. A summary of these consultation responses is provided in Table 9.1.

Table 9.1: Consultation Feedback and Response

Consultee	Date Received	Consultation Response	Where and how is this addressed?
Energy Consents Unit	20 th September 2024	Biodiversity enhancement:- The Company should take note of the requirements of Policy 3(b) of National Planning Framework 4 whereby biodiversity enhancements are to be provided in addition to any proposed mitigation. Information on predicted losses and proposed offsetting and delivery of positive effects on biodiversity should be clearly set out in the EIA report.	Biodiversity enhancements are set out in the EIAR in the Technical Appendix 8.3: Outline Habitat Management Plan.
		Bird surveys: It is recommended by the Scottish Ministers that decisions on bird surveys – species, methodology, vantage points, viewsheds and duration – site specific and cumulative – should be	Consultation was undertaken with NatureScot and standard guidance followed in the design and implementation of bird surveys, with details of survey dates reported in

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		made following discussion between the Company and NatureScot.	Technical Appendix 9.1, and methods and results and any limitations summarised in this Chapter.
		Designated areas, protected areas and protected species: The Scottish Ministers recommend that the Company seek the agreement of the Highland Council ... and NatureScot regarding the designated sites, protected areas and protected species to be included in the EIA report. The Company should ensure that assessment in respect of impacts on the Flow Country World Heritage Site (WHS) should be carried out and included in the EIA report. Where required, sufficient information should be included in the EIA report regarding Habitat Regulation Appraisals (HRA).	Information to inform the HRA for the Caithness and Sutherlands Peatlands Special Protection Area (SPA) has been provided in several places, for the project alone and in the cumulative/in combination section, but most particularly in 9.312 to 9.318. Consideration has been given to the universal values of the Flow Country World Heritage Site (WHS) but as these relate to habitat criteria, this designation is assessed in Chapter 8: Ecology.333
		Ecology and ornithology and designated and protected areas: The EIA report should provide a baseline survey of bird interests on site. Before an application is submitted it needs to be categorically established which species are present on the site, and where they are present. Further, the EIA report should provide an account of the habitats present on the site of the proposed Development. It should identify rare and threatened habitats, and those protected by European or UK legislation, or identified in national or local Biodiversity Action Plans.	Comprehensive ornithology baseline surveys were completed from October 2022 to August 2024, and are reported in detail in Technical Appendix 9. 1 Habitats have been mapped, with results reported in Chapter 8: Ecology and its accompanying Technical Appendix 8.1.
		The mitigation measures suggested for any significant environmental impacts identified should	Details of embedded mitigation are given in 9.78 to 9.86. Given the absence of significant

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		be presented as a conclusion to each chapter in the EIA report.	effects on birds as a result of this mitigation, no further measures are required, as stated in 9.320.
NatureScot	26 th August 2024	Designated Sites: The EIA should assess the direct and indirect impacts on the following protected sites and their qualifying interests in context of their conservation/management objectives - : Caithness and Sutherland Peatlands Special Area of Conservation SPA and Ramsar site, and Strath Duchally Site of Special Scientific Interest (SSSI) . The assessment should also consider the impact of the proposal as a single development and cumulatively with other developments affecting these protected areas.	The effects of the proposed development on these designated sites are included in this assessment. This includes an HRA for the Caithness and Sutherlands Peatlands SPA, which also covers the Ramsar Site. An assessment is also included on the bird-related universal values of the Flow Country World Heritage Site (WHS). As well as effects from the proposed development, consideration is also given to cumulative effects and in combination effects with other plans and projects in the relevant sections of this Chapter.
		Impacts on the Flow Country WHS: The proposal is located partially within the World Heritage Site (WHS). The EIA should assess the proposal's impacts, (direct, indirect and temporary) including cumulatively, on the site's Outstanding Universal Value (OUV).	The Flow Country was inscribed under Criterion (ix), due to its Outstanding Universal Value as a blanket bog ecosystem. Unlike Criterion x, Criterion ix makes no specific reference to birds and therefore the proposed development's effects on the WHS is assessed in Chapter 8: Ecology, with no further consideration given to the WHS in Chapter 9: Ornithology.
		We recommend the results of survey and assessment are used to inform the design and layout, seeking to avoid impacts to the sensitivities outlined in Annex 1 and in the Scoping Report. If avoidance of impacts is not possible, we advise any impacts are minimised through appropriate mitigation,	The evolution of the design of the proposed project is described in Chapter 4: Design Evolution. The mitigation measures proposed to minimise impacts on birds from the proposed development are set out in 'Mitigation Measures and Monitoring'

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		details of which should be provided in the EIA Report (EIAR).	section of this Chapter and are also summarised in Chapter 16: Schedule of Mitigation.
		Strath Duchally SSSI: The application area is located partially within this SSSI, protected for its blanket bog, breeding golden plover, dunlin and greenshank. Where impacts to this SSSIs features are identified, this should be considered further within the EIAR. In relation to the site's bird interests, the Developer may find the SSSI's Site Management Statement useful in identifying which species regularly breed on the SSSI.	The effects of the proposed development on this SSSI are included in this assessment, including consideration of its Site Management Statement.
		The site was inscribed as a WHS due to it being the most outstanding example of a blanket bog ecosystem globally. Assessment of impacts to the WHS only needs to consider criterion (ix) for peatland ecosystem quality.	The Flow Country was inscribed under Criterion (ix), due to its Outstanding Universal Value as a blanket bog ecosystem. Unlike Criterion x, Criterion ix makes no specific reference to birds and therefore the proposed development's effects on the WHS is assessed in Chapter 8: Ecology, with no further consideration given to the WHS in Chapter 9: Ornithology.
		Ornithology: Overall, the proposed survey methodology looks to be satisfactory.	Noted.
		We recommend surveys for roosting raptors are undertaken in accordance with our guidance;	These were undertaken.
		Consideration should be given to habitat suitability for capercaillie.	Habitat suitability for capercaillie has been assessed using data from three sources. Baseline Phase 1 Habitat survey results of the site reported in Chapter 8: Ecology was reviewed, and the characteristics of the forestry on site was considered using details in

Consultee	Date Received	Consultation Response	Where and how is this addressed?
			Chapter 14:Forestry. From examination of this information and from the results of baseline bird surveys, it is evident there is no suitable capercaillie habitat present on site. Furthermore, the data search obtained for the site and its surroundings from RSPB contains no capercaillie records.
		Once survey work is complete an assessment of potential impacts through habitat loss/change, disturbance and/or displacement, barrier effects, and collision risk to any SPA and wider countryside bird populations will be required, both for the proposal on its own and in combination with other projects.	The effects of the proposed development on important ornithological features have been assessed for habitat loss/change, disturbance/displacement during construction and operation of the proposed project, and for collision risk and barrier effects during the 35-year operational lifetime of the proposed development.
		We advise that the cumulative assessment is carried out at the level of the relevant Natural Heritage Zone (NHZ) 5 for this proposal) or SPA population.	The cumulative assessment has been carried out for NHZ5, at the Scottish scale and UK scale, where relevant. The in-combination assessment for the Caithness and Sutherland Peatlands SPA/Ramsar Site has been carried out for plans and projects for which Likely Significant Effects may occur. In determining these plans and projects, use has been made of NatureScot's cumulative spreadsheet, with desk study work to up-date it.
		Depending on submission timescales we may be able to provide additional data to assist with the cumulative assessments, on request from the applicants.	Noted.

Effects Assessed in Full

9.17 In light of relevant guidance and consultation feedback, and the known potential effects of wind farms on birds, the following effects were scoped into this assessment:-

- Direct habitat loss as a result of wind farm construction;
- Displacement of bird populations from the site and surrounding area from construction, operation and decommissioning of the proposed wind farm; and
- Death or injury from rotating turbine blades and other structures associated with wind farms.

9.18 These potential effects have been assessment in detail on:-

- The integrity of the Caithness and Sutherlands Peatlands SPA, designated for ornithological features of UK importance;
- The integrity of the Caithness and Sutherlands Peatlands Ramsar Site, designated for wetland and ornithological features of international importance;
- The ornithological features of the Strath Duchally SSSI;
- Bird populations at a regional scale, specifically the Peatlands of Caithness and Sutherland Natural Heritage Zone (NHZ) 5; and
- The conservation status of bird species afforded the highest level of statutory protection via inclusion in Annex I of Directive 2009/147/EC on the Conservation of Wild Birds ('the Birds Directive') and/or Schedule I of the Wildlife and Countryside Act 1981 (as amended).

9.19 These potential effects on birds have been assessed for the Proposed Development alone and cumulatively/in-combination with other plans and projects, in particular that have been predicted to have a potential effect on the Caithness and Sutherlands Peatlands SPA/Ramsar Site or the Strath Duchally SSSI.

Effects Scoped Out

9.20 Bird species considered as being of local or less than local importance (as defined in Table 9.2) are scoped out of the assessment.

Cumulative Effects

9.21 The proposed development's cumulative effects (or 'in combination effects' in the terminology of the Habitats Directive and Regulations) have been assessed, notably the potential effects of territory displacement and collision on the qualifying species of the Caithness and Sutherland Peatlands SPA/Ramsar Site. NatureScot maintains a compilation of predicted collision impacts from proposed wind farm developments around the SPA and this was obtained and up-dated to help inform the EIA and HRA cumulative/in combination assessment.

9.22 The resulting cumulative/in combination assessment has been undertaken following NatureScot guidance, and in consideration with the SPA and relevant NHZ (NHZ5 Caithness and Sutherland Peatlands Highlands) bird populations.

- 9.23 The plans and projects considered in the cumulative/in combination assessments are those already in the planning system. Where predicted effects on birds from developments have not been quantified, a qualitative assessment has been made.

Study Area

- 9.24 The Ornithology Survey Areas are illustrated on Figure 9.2, located in Volume 2 of the EIAR.
- 9.25 The survey areas were based on best practice guidance as recommended by NatureScot (SNH, 2017), with the following survey buffers used around the proposed development:
- 500m for the moorland breeding bird survey;
 - 1.5km for black grouse;
 - 2km for breeding raptors, other than golden and white-tailed eagle, which was 6km; and
 - 2km for breeding red and black-throated divers.

Desk Based Study and Data Sources

- 9.26 Information from publicly available survey data, scientific publications, grey literature and EIA/HRAs for nearby wind farm developments was searched to help build a full understanding of bird communities in and around the Site.
- 9.27 In addition to the key references listed above, other sources of contextual data also included:
- The Birds of Scotland (Forrester *et al.*, 2007);
 - Natural Heritage Zone Bird Population Estimates (Wilson *et al.* 2015);
 - Bird Atlas 2007-11: the Breeding and wintering Birds of Britain and Ireland (Balmer *et al.* 2013);
 - Population estimates of birds in Great Britain and the United Kingdom (Woodward *et al.* 2020);
 - Population estimates of wintering waterbirds in Great Britain (Frost *et al.* 2019);
 - Scottish Raptor Monitoring Scheme Report 2023 (Challis *et al.* 2023); and
 - The Status of UK SPAs in the 2000s: the Third Network Review (Stroud *et al.* 2016).

Statutory Sites

- 9.28 A search for all SPAs/Ramsar sites within 20km of the proposed development and 10km for other designated sites with bird interests was made using standard online sources, namely:-
- NatureScot Sitelink;
 - Joint Nature Conservation Committee (JNCC) website; and
 - Scottish Environment website.

- 9.29 The designated sites identified are shown in Figures 9a-c. The proposed development is adjacent to the Caithness and Sutherlands Peatlands SPA/Ramsar Site and Strath Duchally SSSI.

Existing Records

- 9.30 Any records of black grouse, waders or Red and Amber-listed Birds of Conservation Concern from within 2km of the Site and within the last five years were requested from the RSPB.
- 9.31 Raptors recorded within 2km of the Site in the last five years (extended to 6km for golden and white-tailed eagles) were requested from the Highland Raptor Study Group (HRSG).
- 9.32 Where relevant, pre-submission, construction and post-construction bird data from nearby wind farms were also referred to, to add further insights into potential impacts from the proposed development. This included use of bird surveyor results and observations from Ecological Clerks of Works (ECoW) on how birds responded to wind farm construction activity.

Target species

- 9.33 In line with NatureScot guidance, the assessment of effects from the proposed development focussed on species of conservation important or that are particularly susceptible to adverse effects. The target species therefore included:-
- Annex 1 species listed in the Birds Directive;
 - Schedule 1 birds protected under the Wildlife and Countryside Act 1981 (as amended); and
 - Red-listed Birds of Conservation Concern (BoCC 5).
- 9.34 Consideration was also given to whether the site and its surrounding survey buffers held particular concentrations of other species, including any on the Scottish Biodiversity list or Local Biodiversity Action Plan (LBAP). However, the site is of poor-quality habitat for birds, being almost entirely a non-native conifer plantation, so there were no such concentrations present.
- 9.35 Therefore, following consultation and desk study, the following species/groups were identified as target species:
- All qualifying species of the Caithness and Sutherlands Peatlands SPA and Ramsar Site;
 - All raptors/owls listed on Annex I of the Birds Directive/Schedule I of WCA;
 - All wild goose, swan and duck species (with the exception of Canada goose); and
 - All wader species.
- 9.36 The following species/groups were identified as secondary species;
- All other raptor and owl species;

- Raven; and
- Gulls.

Ornithology Baseline Surveys

9.37 Baseline ornithology surveys were completed between October 2022 and August 2024 (inclusive) and comprised:-

- **Flight activity Vantage point (VP) surveys:** Flight activity surveys of target species, using three VP locations (from October 2022 to August 2024);
- **Breeding raptor surveys:** Survey area included a 2km buffer around the site (and to 6km for golden and white-tailed eagles) and covered two breeding seasons (April to July 2023 and April to June 2024);
- **Breeding diver surveys:** Survey area included a 2km buffer around the site and covered two complete breeding seasons (April to September 2023 and April to August 2024);
- **Moorland breeding bird surveys (MBBS):** Survey area included a 2km buffer around the site and covered two complete breeding seasons (April to July 2023 and April to July 2024); and
- **Black grouse surveys:** Survey area included a 1.5km buffer around the site and covered two complete breeding seasons (mid-April to mid-May 2022 and mid-April to mid-May 2024).

9.38 The survey area extents are illustrated on Figure 9.2. An overview of the methods followed for each survey is provided below. Details of survey dates and weather conditions are provided in Technical Appendix 9.1.

Flight Activity Surveys (Vantage Point Surveys)

9.39 Flight activity (VP) surveys were completed by experienced field ornithologists to map and quantify flight activity over and around the proposed development, with results used to carry out collision risk modelling (CRM). The distribution and nature of flight activity also helped inform breeding territory distribution and habitat use by target species.

9.40 These surveys covered two full breeding seasons (March to August 2023 and 2024) and two non-breeding seasons (October 2022 to February 2023 and September 2023 to February 2024), with a minimum of 36 hours of survey during each season per VP. Each watch lasted up to three hours with a minimum 30-minute break in between watches. Visit details of the vantage point surveys are provided in Technical Appendix 9.1.

9.41 VP locations and viewsheds showing the visible air space above 20m from each of the three VPs used are illustrated on Figure 9.3.

9.42 As can be seen from Figure 9.3, the recommended 500m buffer around turbines could not be fully included because of the presence of the plantation for T1, T2, 3, T4, T8, T10, T12 and T15. T14 was outside VP coverage altogether. However, as explained in Technical Appendix 9.2, the habitat and topography in the area surrounding Turbine 14 was similar to that around other nearby turbine locations and therefore flight activity around T14

would be expected to be similar. Furthermore, being well within the conifer plantation and therefore in unsuitable habitat for target species, there would be no flight activity expected for these species (with the possible exception being goshawk, but there was no evidence of this species breeding within the survey area). Therefore, the position of T14 outside the vantage points' viewsheds is not considered to have diminished the detection of flight activity of target species.

9.43 In accordance with NatureScot guidance, flight lines of all target species passing through the VP viewshed were mapped in the field. Each recorded flight line was numbered and cross-referenced to the following flight information, which was recorded on standardised survey forms:

- Species, age and sex (where identification of age/sex was possible);
- Number of birds;
- Time (when first seen);
- Duration of flight within the viewshed; and
- Flight height on detection and at 15 second intervals, recorded in the following height bands:
 - i. Band 1 – 0m to 75m
 - ii. Band 2 - 75m – 255m;
 - iii. Band 3 – > 255m

9.44 Birds recorded as flying within Band 2 were considered to be flying at potential collision height, as this represents the height range at which birds could be interacting with rotating turbine blades. Flights were digitised and entered onto a Geographical Information System (GIS), to help generate the outputs needed for collision risk modelling.

9.45 Flight activity of secondary species was summarised by recording activity (number of flights) in five-minute increments throughout the VP survey. Recording of target species took priority over that of secondary species, in accordance with guidance.

Black Grouse Surveys

9.46 Black grouse surveys were completed in April and May of 2023 and 2024, based on standard methods detailed in Gilber *et al.* (1998). This requires that all suitable habitat for displaying black grouse is searched between one hour prior to sunrise and two hours after sunrise.

9.47 In accordance with NatureScot guidance, the black grouse survey area comprised the developable area plus a 1.5km buffer (Figure 9.2). The dates, times and weather conditions of the black grouse surveys are given in Technical Appendix 9.1.

Breeding Bird Surveys

Moorland Breeding Bird Survey

9.48 The moorland breeding bird survey (MBBS) was undertaken monthly between April and July (inclusive) in 2023 and 2024, using the four-visit version of the Brown and Shepherd

(1993) methodology recommended in NatureScot guidance. Coverage was open moorland within the site and surrounding 500m survey buffer (Figure 9.2).

- 9.49 Surveyors approached all open ground to within 100m and spent 20-25 minutes surveying each 500m × 500m grid square. All target species seen or heard were recorded accurately onto large-scale field maps, using standard British Trust for Ornithology (BTO) Common Bird Census (CBC) notation. This notation indicates both species and observed behaviour. Territorial and breeding behaviours can therefore be highlighted.
- 9.50 Dates, times and weather conditions for each survey visit are given in Technical Appendix 9.1.
- 9.51 Using the data from each of the four monthly visits, putative territory centres of breeding target species were mapped and the number of territories determined by convention, using the consistency and separation of territorial behaviour across all four survey visits. If a bird exhibiting territorial behaviour was recorded at a particular location within the survey area on at least one of the survey visits, then the location is taken to be a breeding territory. For wader territorial registrations within 500m of each other, a combination of analysis of each record and professional judgement was used to determine whether the observations were of birds from the same or separate territories. Further criteria used to classify territorial/breeding behaviour were:
- Presence of nest, eggs and/or chicks;
 - Alarm calling indicative of nest, young or territory;
 - Singing males;
 - Displaying or song-flighting;
 - Distraction display;
 - Birds aggressively defending territories;
 - Birds are seen carrying food to nest or young; and
 - Birds carrying faecal sacs away from active nests.
- 9.52 Where extra insights on territory distribution could be gained from observations during other breeding season survey work, these incidental records from surveyors were also considered, to help refine the interpretation of territory distribution.
- 9.53 As greenshank can be difficult to survey, given their complex use of the landscape for displaying, nesting and chick rearing (Nethersole-Thompson and Nethersole-Thompson 1979), consideration was given to the timing of surveys so that at least one visit each year fell within the two peak detectability periods for this species (Hancock *et al.* 1997).
- 9.54 Specifically, a minimum of two visits are recommended, the first in the period 10 April to 25 May (with the highest detectability being between 15th April to 8th May), and the second in the period 26th May to 11th July (the highest detectability period being 1st – 23rd June). The 2023 survey dates fell within both peak detectability periods, although this was not the case in 2024. To account for this in the assessment, so that greenshank territory numbers are not under-estimated, the number of greenshank territories for 2024 has been assumed to be the same as in 2023.

Breeding Raptor Survey

- 9.55 The breeding raptor survey was completed between April and July 2023 and April and the end of June 2024 (inclusive) to identify breeding raptors and owls within the survey buffer. Raptor breeding territories and activity are detected through a combination of walk-over surveys and fixed-point watches, carried out using the survey methods specified in Hardey *et al.* (2013).
- 9.56 The breeding raptor surveys covered all suitable habitat in accessible areas within 1 km of the proposed development for barn owl and goshawk, within 2km for all other raptor species, and extending up to 6km for golden and white-tailed eagles (access permitting).
- 9.57 The survey area is shown in Figure 9.2 and survey dates, times and weather conditions are given in Technical Appendix 9.1.

Collision risk modelling

- 9.58 Collision risk modelling (CRM) estimates the number of birds that may collide with turbines over time, based on flight activity, flight speed, bird length and turbine specifications. It uses a number of precautionary assumptions, including applying a precautionary 200m buffer distance from the outer turbines to define the Turbine Envelope where birds at Potential Collision Height (PCH) are at risk.
- 9.59 CRM is only undertaken when a species has a minimum of three flights per season where the flight is both at PCH and within the Turbine Envelope. Using fewer flights fails to give a statistically reliable collision rate.
- 9.60 The method and results from the CRM are detailed in Technical Appendix 9.2, with summary results presented in this Chapter.

Assessment of Significance

- 9.61 This section describes the process by which the significance of any predicted impact on bird populations is assessed. The assessment follows the guidance produced by Chartered Institute of Ecology and Environmental Management (CIEEM). This sets out the process for assessment as a series of stages as listed below:-
- Describing the ornithological baseline in the Zone of Influence (Zol) through survey and desk study;
 - Identifying Important Ornithological Features (IOFs), defined as the species of the highest ornithological importance present in the Zol;
 - Determining the nature conservation importance of the IOFs present within the Zol;
 - Identifying and characterising the potential impacts on these IOFs, based on the nature of the construction, operation and decommissioning activities associated with the proposed development. The potential effects are assessed both for the proposed development alone and in combination with other developments in the surrounding area (cumulative effects);

- Determining the magnitude of the impacts including consideration of the sensitivity of the ornithological feature and the duration and reversibility of the effect;
- Determining the significance of the impacts based on the effect's magnitude and duration, the likelihood of the effect occurring and the nature conservation value of the IOF.
- Identifying embedded mitigation that will counteract or avoid adverse impacts;
- Determining the residual impact significance after embedded and additional mitigation measures have been applied;
- Identification of any monitoring requirements; and
- Identification of any residual significant impacts.

9.62 Further details relating to the methods used for evaluating the importance of ornithological features, characterising potential impacts, and assessing the significance of residual effects follow below.

Nature Conservation Importance

9.63 The nature conservation importance of each target and secondary species potentially impacted by the proposed development was defined in accordance with the definitions set out in Table 9.2.

Table 9.2: Nature Conservation Importance Definitions Used in this Assessment

Importance	Definition
International (Very High)	Species listed as qualifying feature of an internationally designated site (SPA/Ramsar Site). This includes birds outside the internationally designated site but when there is clear connectivity with the designated population.
National (High)	Species present at nationally significant numbers (normally >1% of UK population) and/or listed as a qualifying feature of a nationally designated site (SSSIs and NNRs). This includes birds outside of a nationally designated site, where the site has clear connectivity with the qualifying population.
Regional (Medium)	A bird species present in numbers of regional importance, notably >1% of regional or NHZ population.
District (Low)	A bird species present in numbers of district or lower level, notably >1% of the district population.
Local (Negligible)	A bird species that is of nature conservation value in a local context only.

Magnitude

9.64 The magnitude of an impact on target species is the level of change caused by the proposed development.

9.65 Assessing the magnitude of an impact firstly requires consideration of a range of factors, notably the birds' behavioural sensitivity to human activity (and any habituation birds may have developed), its population size and trends, the populations' isolation, the species' ecological niche (notably its reliance on a particular habitat or prey source), and the degree to which its productivity and survival are density dependent.

9.66 In addition, the magnitude of an impact is influenced by the duration of the impact, with the definitions used in this assessment being:-

- Permanent (beyond the 35 years duration of the development),
- Long-term (15-35 years),
- Medium-term (5-15 years); or
- Short-term (up to 5 years).

9.67 Knowledge of birds' ability to recover from impacts is also required to assess the duration of the effect, and whether it is reversible or not. For example, mortality events for species with small population sizes and low reproductive output (such as raptors) will take considerably longer to recover and result in a greater magnitude of effect compared to abundant and widespread species that have high output and will fill vacant territories and replace numbers rapidly (e.g. small passerines such as skylark and meadow pipit).

9.68 In light of these considerations, this assessment has considered the following characteristics of potential effects on birds:-

- **Nature of effect:** whether it is positive (beneficial) to the IOF, e.g. by increasing species diversity or extending habitat, or negative (detrimental), e.g. by loss of, or displacement from, suitable habitat;
- **Extent:** the spatial or geographical area over which the effect may occur, also known as the Zone of Influence of the effect;
- **Magnitude:** the size, level, intensity, or volume of the effect;
- **Duration:** the duration of the activity with potential to cause effect;
- **Frequency:** the number of times an activity occurs may cause the effect;
- **Timing:** when the potential effect is likely to occur, for example during or outside the breeding season, or during dusk or dawn, as this could determine if the activity coincides, for example, with a critical life stage (e.g. nest building or chick rearing); and
- **Reversibility:** a reversible effect is one from which recovery is possible within the lifetime of the species undergoing the effect from the proposed development.

9.69 Taking these factors into account, the criteria used to define magnitude of change are provided in Table 9.3, accompanied by examples of the level of change in bird populations that each could involve.

Table 9.3: Magnitude of Effect

Magnitude	Criteria
Very high	The loss of all or a major proportion of the bird's population, sufficient to irreversibly compromise its viability in the long term. As a result, the distribution of the population is affected over a significant area. For example, the immediate loss of >80% of the bird's population, or a rapid increase in mortality sufficient to cause the loss of that population well within the lifetime of the project.
High	The reduction of the bird's population or its productivity sufficient to irreversibly harm its long-term viability. The distribution of the population is also affected over a significant area. For example, the immediate reduction

Magnitude	Criteria
	of >20% of the bird's population or an increase in mortality sufficient to risk the elimination of that population over the lifetime of the project.
Medium	The reduction of the bird's population or productivity sufficient to alter its short, medium or term viability but not risking its long-term viability over the lifetime of the project. The distribution of the population is reduced at a substantial but not extensive area. For example, the immediate reduction of 10-20% of the population but the population remaining at that lower level during the remainder of the project's lifetime.
Minor	Sufficiently small-scale or short-duration effects that cause no long-term decline in the population. The distribution of the population may be reduced locally but it does not alter the overall extent of habitat it could potentially occupy. For example, less than 10% decline in the population or a minor reduction in productivity that would not lead to a decline of >10% in the population over the lifetime of the project.
Negligible	A potential impact that is not expected to affect the population in any meaningful way, with no detectable decline in population or distribution. For example, there may be a localised loss or redistribution of the population within or adjacent to the site, but it would affect <10% of the local population and not reduce its viability over the lifetime of the project.

Significance of Effects

- 9.70 The combined assessment of both the nature conservation importance of the receptor and the magnitude of the effect determined whether or not an effect was significant. This matrix is shown in Table 9.4, and the description of each effect is explained in more detail in Table 9.5.
- 9.71 Effects categorised as moderate or major significance are judged to be significant under EIA Regulations, whilst those categorised as minor or negligible significance are not considered significant in EIA terms.
- 9.72 Where potential effects are identified as being significant, mitigation measures to avoid, reduce or remedy are recommended where possible.

Table 9.4: Significance of Effects Matrix

Magnitude	Sensitivity				
	International (Very High)	National (High)	Regional (Medium)	District (Low)	Local (Negligible)
Very High	Major	Major	Major	Moderate	Minor
High	Major	Major	Moderate	Minor	Minor
Medium	Major	Moderate	Minor	Negligible	Negligible
Minor	Moderate	Minor	Negligible	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible	Negligible

Table 9.5: Explanation of Significance of Effects Categories

Significant Criteria	Description
Major	Significant effect as the impact will result in permanent and very high adverse effects on the integrity of the bird population and extensively impact its distribution.
Moderate	Significant effect as the impact will result in medium- or long-term adverse effects on the integrity of the bird population and impact its distribution.
Minor	The effect will not significantly impact the medium- or long-term viability of the bird population or have a substantive effect on its distribution or the habitat which the species could occupy. This is not a significant effect.
Negligible	There are not material effects on the bird population or its distribution or the or the habitat which the species could occupy. This is not a significant effect.

Approach to Assessing Cumulative/In Combination Effects

- 9.73 In line with NatureScot guidance (2024) on assessing cumulative/in combination effects in relation to wind farms, projects already operational and those in planning are included in the cumulative/in combination assessment. NatureScot's cumulative spreadsheet was obtained and up-dated for all developments with a potential effect on the Caithness and Sutherland Peatlands SPA/Ramsar site, and for NHZ5 bird populations.
- 9.74 Small projects with three or fewer turbines are also excluded from the cumulative assessment. This is because being so small, they are not subject to the same level of detailed ornithological assessment and therefore typically lack EIA Reports or bird survey and CRM data. Due to the small scale of such projects, effects are likely to be negligible on the ornithological features assessed in this Chapter in any case. Other small-scale renewable projects such as micro hydro schemes have also been scoped out for similar reasons.

Assumptions and Limitations

- 9.75 As explained in paragraph 9.42 and Technical Appendix 9.2 , limited and justifiable assumptions have been made to ensure that the localised variations in viewshed coverage from NatureScot guidelines do not affect the validity of the CRM results. It is not unusual for there to be such variation in viewshed coverage where evolution of turbine layouts could not have been foreseen or where there were limitations on access outside the red line boundary.
- 9.76 The possible consequences of the 2024 MBBS dates not coinciding with greenshank peak detectability periods have been accounted for, as explained in paragraph 9.53.
- 9.77 The breeding raptor survey dates did not include the February to March inclusive period in 2023 or 2024, or cover July 2024, but these omissions are not considered to limit the validity of breeding raptor findings. This reasoning for this conclusion is that the habitat on site is poor quality for breeding raptor target species, together with the insights from February to August flight activity surveys and the lack of incidental records of raptors during other surveys over 2023 and 2024. Also, although coverage by Raptor Study Groups

cannot be comprehensive because of the reliance on volunteers, the absence of HRSG (and RSPB) records of raptors from the proposed development and its search areas over the last five years add some credence to the limited raptor activity in this area.

Embedded Mitigation

- 9.78 Embedded mitigation covers the standard measures incorporated into a development to ensure compliance with legislation and good practice.
- 9.79 With respect to birds, the main legislation which embedded mitigation needs to comply with is the Wildlife and Countryside Act 1981 (as amended). Under this legislation, it is an offence to kill or injure any bird, or to damage or destroy nests and eggs. Breeding species listed on Schedule 1 of the Act are afforded extra protection from disturbance while breeding.
- 9.80 The other component of embedded mitigation with the proposed development is the restriction of its footprint to within the pre-existing conifer plantation, a habitat of negligible ornithological value. Whilst the plantation is extant, this has minimised potential effects on the surrounding moorland habitat, including the Caithness and Sutherland Peatlands SPA/Ramsar Site and the Flow Country World Heritage Site (WHS).

Construction Phase Embedded Mitigation

- 9.81 **Timing of works:** Although no firm commitment can be given unfortunately due to uncertainties over the timing of any consent and financial close, and potential supply chain constraints, as far as possible:-
- Forest felling works will be undertaken outside the April to July breeding season of the qualifying species recorded on adjacent open habitats during baseline surveys. This is a firmer commitment, because the works are more straightforward, with a less restricted supply chain.
 - The foundation excavations and erection of turbine numbers 1, 3, 5, 8, 10 and 12 will be scheduled, if possible, outside the April to July breeding season for the same reason. If that whole period cannot be avoided, an effort will be made to avoid April and May, when sensitivity by nesting birds to disturbance is greatest.
- 9.82 **Pre-felling checks for all nesting species in the conifer plantation and open habitats within it (such as rides and riparian corridors):** Pre-felling checks will be carried out by a suitably qualified and experienced ornithologist so that active bird nests are avoided and cordoned off to prevent damage or disturbance.
- 9.83 **Pre-construction survey for breeding SPA qualifying species, Schedule 1 and Red and Amber-listed BoCC:** In addition, a pre-construction breeding bird survey of open habitat outside the conifer plantation and within 1km of works will be completed ahead of any operations, by a suitably experienced and qualified ornithologist, consisting of a four visit Brown and Shepherd (1989) moorland breeding bird survey and a breeding raptor survey. All records will be digitised and mapped, and putative territories marked on, and made available to the ECoW (see below). Prior to construction (including any site investigation works carried out during the bird breeding season), a Breeding Bird Protection Plan will be

submitted for approval by NatureScot and The Highland Council setting out all detailed measures to ensure nesting birds will be fully protected and wildlife legislation will be complied with. The Breeding Bird Protection Plan will include such details as the exclusion distances from nests, stipulations that no works will be permitted within the exclusion zone and no personnel or vehicles will be allowed to enter or pass through until the ECoW has confirmed that the chicks have fledged, or the breeding attempt has failed.

- 9.84 **Deployment of a full-time Ecological Clerk of Works throughout the construction period:** To ensure implementation and compliance of the Breeding Bird Protection Plan throughout the construction period, a suitably qualified and experienced ECoW, approved by NatureScot and The Highland Council, will be appointed by the applicant to be on site full-time. They will issue weekly reports of implementation and compliance with the Breeding Bird Protection Plan to NatureScot, The Highland Council and RSPB. As part of their duties, the ECoW will deliver 'toolbox talks' to all site forestry and construction staff to ensure that all contractors working on the proposed development are aware of ornithological sensitivities and relevant legislation.

Operational Phase Embedded Mitigation

- 9.85 Routine maintenance required during operation is expected to be minimal, limited to small areas and of temporary duration. However, should significant operational works be required during the nesting bird season, or any Schedule 1 nesting birds be observed during the operational phase, it is recommended that the mitigation measures outlined above for the construction phase are implemented to protect breeding birds and ensure compliance with the relevant legislation.

Decommissioning Phase Embedded Mitigation

- 9.86 As decommissioning works are likely to be of a similar nature and duration as construction activities, the embedded mitigation outlined above for construction works should also be implemented during the decommissioning phase, in order to protect breeding birds.

Baseline Conditions

- 9.87 This section gives the results of the ornithology desktop study and field surveys for the proposed development. It details the bird species present and their conservation significance.

Desktop Study

Designated Sites

- 9.88 The designated sites up to 20km from the proposed development are shown in Figures 9.1a and 9.1b. No wind farm infrastructure falls within any designated area, although the proposed development's red line boundary extends into the Caithness and Sutherlands Peatlands SPA/Ramsar Site, the underlying Strath Duchally SSSI and the Flow Country WHS.
- 9.89 It is important to emphasize however, this overlap only arises from the red line boundary following a land ownership boundary. It does not indicate any wind farm infrastructure

extends into of these designations. All wind farm infrastructure is within the non-native conifer plantation adjoining these designated sites as shown in Figures 9.1a and 9.1b.

9.90 Table 9.6 lists the qualifying species of the Caithness and Sutherlands Peatlands SPA. Table 9.7 lists the additional qualifying species of the Caithness and Sutherlands Peatlands Ramsar Site and Table 9.8 gives the designated features of Strath Duchally SSSI.

Table 9.6: Qualifying species of the Caithness and Sutherlands Peatlands SPA

Feature	Designation ¹ (date of estimated population)	Status ²	Distance of SPA to the Site	Connectivity distances ³
Red-throated diver (breeding)	46 pairs, 3.5% of the GB population (2006)	Favourable	0m	Generally, < 8km
Black-throated diver (breeding)	26 pairs, 15% of the GB population (1994)	Favourable	0m	Likely to be < 10km
Hen harrier (breeding)	Mean of at least 14 pairs, at least 2.8% of the GB population (1993 to 1997).	Favourable	0m	Core range 2km, with maximum range of 10km
Golden eagle	5 pairs, 1% of the GB population (1992)	Favourable	0m	Core range 6km with maximum range of up to 9km
Merlin (breeding)	Estimated 54 pairs, 4% of the GB population (1993 and 1994)	Favourable	0m	< 5km
Short-eared owl (breeding)	30 pairs, 2% of the GB population	Not assessed	0m	Core range 2km with maximum range 5km
Golden plover (breeding)	1,064 pairs, 5% of the GB population (1993 and 1994)	Favourable	0m	Core range 3km with maximum 11km
Wood sandpiper (breeding)	Up to 5 pairs, up to 40% of the GB population	Favourable	0m	None published
Dunlin (breeding)	1,860 pairs, 20% of the GB population (1993 and 1994)	Favourable	0m	Core range 500m with maximum range 3km
Greenshank (breeding - migratory)	At least 653 pairs, at least 0.9% of the Europe/western Africa biogeographic population and at least	Favourable	0m	Core range 2km, with maximum range 3km

¹ Citation for Special Protection Area (SPA): Caithness and Sutherland Peatlands SPA available [here](#)

² <https://informatics.sepa.org.uk/ProtectedNatureSites/>

³ SNH (2016a), available [here](#)

Feature	Designation ¹ (date of estimated population)	Status ²	Distance of SPA to the Site	Connectivity distances ³
	59.4% of the GB population (2009)			
Wigeon (breeding - migratory)	At least 43 pairs, <0.1% of the western Siberia/north-western/north-eastern Europe biogeographic population and at least 10.8% of the GB population (1993/94)	Favourable	0m	None published
Common scoter (breeding - migratory)	At least 21 pairs, <0.1% of the western Siberia/western and northern Europe/north-western Africa biogeographic population and at least 40.4% of the GB population (2007)	Unfavourable	0m	None published

9.91 The Caithness and Sutherlands Peatlands SPA is underlain by the Caithness and Sutherlands Peatlands Ramsar Site, which gives protection to a similar but not identical range of species. The Ramsar Site's designation documentation includes slight inconsistencies in the species mentioned, however; most are qualifying species of the SPA so already receive the highest level of protection in any case⁴. Therefore, all additional bird species noted in the Ramsar Site documentation are assessed as a precaution, to ensure the assessment of effects of the proposed development is fully comprehensive. The four species are listed in Table 9.7.

Table 9.7: Additional Qualifying species of the Ramsar Site

Feature	Designation	Status	Distance of Ramsar to the Site	Connectivity distances
Arctic skua (breeding)	39 apparently occupied territories, representing an average of 1.8% of the GB population (Seabird 2000 Census)	Favourable	0m	2.7km (from Woodward et al. 2019) quoted in NatureScot (2023)

⁴ The [Caithness and Sutherland Peatlands Ramsar Site Citation](#) lists species that qualify under the Convention's Criteria 2 as red-throated and black-throated divers, golden plover, wood sandpiper and dunlin, plus wigeon, common scoter and greenshank under Criterion 4. In its Section 10 'Overview', the Joint Nature Conservation Committee [Information Sheet on the Ramsar Site](#) (last up-dated in 2005) states the 'range of habitats supports a diverse range of breeding waterfowl including internationally important populations of North Scottish greylag goose and dunlin and nationally important populations of ten other waterfowl species. In Section 12 of the Information Sheet, dunlin are listed as qualifying under Criterion 6 as present in internationally important numbers, and under Ramsar Criterion 2, it states '10 waterfowl species are present in nationally important breeding populations'. The names and details of these species are listed in Section 20 'Noteworthy Fauna' of the Information Sheet, and whilst seven are Caithness and Sutherland Peatlands SPA-qualifying species, three are not, namely teal, curlew and Arctic skua. On the [Site Condition Monitoring \(SCM\)](#) database, the monitored features listed for the Ramsar site are breeding bird assemblage, dunlin and greylag geese.

Feature	Designation	Status	Distance of Ramsar to the Site	Connectivity distances
Teal (breeding)	106 pairs, representing an average of 7% of the GB population (Count as at mid- 1990s)	Favourable	0m	None published
Curlew (breeding)	517 pairs, representing an average of 1.5% of the GB population (Count, as at mid-1990s)	Favourable	0m	Core range of 1km with maximum range usually within 2km
Greylag geese (breeding)	No details stated.	Favourable	0m	None published

9.92 The Strath Duchally SSSI is also adjacent to the west of the Site. Whilst all three of its features of scientific interest are also qualifying species of the Caithness and Sutherland Peatlands SPA and Ramsar Site, for the same of completeness, Table 9.8 gives details of these SSSI designated features.

Table 9.8: Designated features of the Strath Duchally SSSI

Feature	Designation	Status	Distance of SSSI to the Site	Connectivity distances
Dunlin (breeding)	Occurs at breeding densities > 1.5 times average for similar habitat in Caithness and Sutherland (reviewed 2009)	Unfavourable	0m	Core range 500m with maximum range 3km
Golden plover (breeding)	As for dunlin	Favourable	0m	Core range 3km with maximum 11km
Greenshank (breeding)	As for dunlin	Favourable	0m	Core range 2km, with maximum range 3km

9.93 The Flow Country was confirmed as a World Heritage Site (WHS) in July 2024, on the basis it met the required universal values for habitat (therefore is considered in more detail in Chapter 8: Ecology). The WHS designation does not give extra legal protection to the area's birdlife as this is already achieved through the Flow Country's SPA, Ramsar and SSSI status.

Existing Records of Protected Species

9.94 The HRSG provided information golden eagle, both historical and current, covering the period 2019 to 2024. The nearest known golden eagle eyrie lies outwith the 6km search area for this species. This information has been used for the assessment.

9.95 RSPB did not have recent records for the Site or its 2km surroundings but did provide historic records of key species.

- 9.96 These data were used as part of the baseline desk study and helped inform the EIA and HRA for the Caithness and Sutherlands Peatlands SPA/Ramsar Site and impact assessment for the Strath Duchally SSSI.

Results of Baseline Ecological Surveys Relevant to Ornithology

- 9.97 Detailed ecological surveys were completed for this EIA and are reported in the Chapter 8: Ecology. The ecology results of relevance to the ornithology assessment are the habitat surveys completed for the proposed development. As shown in Chapter 8: Ecology Figure 8.2, the proposed development lies entirely within non-native conifer plantation. Plantation composition details are also provided in Chapter 14: Forestry.
- 9.98 With the exception of merlin (which do occasionally breed in the edge of conifer plantations next to open moorland), the habitat surveys and plantation data show the site is entirely unsuitable for breeding or foraging by all SPA, Ramsar and SSSI species. This is because conifer plantation is a very poor-quality habitat, being comprised almost entirely of non-native exotic species of low ecological value, being very uniform in species composition, age and structure, and being planted at such high density that it has prevented the development of an understorey, substantive ground vegetation or dead wood suited to native flora or fauna.
- 9.99 The overall habitat characteristics of the site would remain the same, until such time as the plantation reached economic maturity and was felled. Once re-planted, as detailed in Chapter 14: Forestry, post-construction monitoring evidence from wind farm sites as Strathy North shows that it remains relatively unused by SPA breeding species, and once re-stocking reaches the closed thicket stage, it will once again have no habitat value for SPA, Ramsar or SSSI species. In part reflecting this, NatureScot has withdrawn its guidance on post-felling habitat management on harrier, merlin and short-eared owl.

Results of Baseline Ornithological Survey

Flight Activity Survey Results

- 9.100 A total of 450 hours of VP surveys were undertaken (234 hours during the non-breeding season and 216 hours during the breeding season). These hours are summarised in Table 9.9. Detailed VP survey dates and timings are given in Technical Appendices 9.1.

Table 9.9: Summary of Vantage Point survey effort (hours per season per VP)

Season	Period	VP1	VP2	VP2
Non-Breeding season 2022-23	Oct-Mar	36	36	36
Breeding season 2023	Apr-Aug	36	36	36
Non-Breeding season 2023-24	Sept-Mar	42	42	42
Breeding season 2024	Apr-Aug	36	36	36

- 9.101 Overall, flight activity over the proposed development footprint was limited, in terms of the number of flights and the range of species present. The reason for this is largely due to the impoverished habitat on site, given the poor suitability of non-native conifer plantation for the majority of bird species in general and target bird species in particular.
- 9.102 A total of 14 target species were recorded within the VP viewsheds during the 23 months of VP surveys. Table 9.10 gives details of the 25 non-breeding season flights, and Table 9.11 of the 21 breeding season flights⁵. The flights are shown in Figures 9.6a and 9.6b for raptors and other species respectively.
- 9.103 Of the Caithness and Sutherland Peatlands SPA and Ramsar Site qualifying species, there were no hen harrier, short-eared owl, wood sandpiper, wigeon or common scoter flights recorded over the 23 months VP survey period. Of the additional Ramsar Site species not included in the SPA citation, there were no Arctic skua, curlew, teal or greylag geese flights recorded either.

Table 9.9: Target species flights recorded during the non-breeding season

Species	Non-breeding Season	Number of Flights	Number of Birds	Total Bird Seconds	Total Bird Seconds at PCH
Whooper swan	2022-23	1	19	55	55
Whooper swan	2023-24	1	3	93	93
Pink-footed goose	2022-23	0	0	0	0
Pink-footed goose	2023-24	6	451	512	467
White-tailed eagle	2022-23	1	1	616	616
White-tailed eagle	2023-24	4	4	2024	1901
Osprey	2023-24	2	2	331	271
Golden eagle	2022-23	1	1	65	65
Golden eagle	2023-24	3	3	571	39
Goshawk	2022-23	1	1	85	0
Goshawk	2023-24	2	2	76	0
Golden Plover	2023-24	2	2	37	0
Greenshank	2022-23	1	2	67	0

⁵ Definitions of the breeding and non-breeding seasons for each species are taken from NatureScot guidance and have been used to assign the flights in Tables 9.10 and 9.11
<https://web.archive.org/web/20220613155315/www.nature.scot/sites/default/files/2017-07/A303080%20-%20Bird%20Breeding%20Season%20Dates%20in%20Scotland.pdf> (accessed 7th April 2025).

Table 9.11: Target species flights recorded during the breeding season

Species	Breeding Season	Number of Flights	Number of Birds	Total Bird Seconds	Total Bird Seconds at PCH
Red-throated diver	2023	1	1	98	98
Black-throated diver	2024	1	1	193	193
Pink-footed goose	2023	2	120	244	66
White-tailed eagle	2023	4	4	2024	1901
White-tailed eagle	2024	4	7	478	432
Osprey	2023	1	1	125	0
Osprey	2024	1	1	130	45
Golden eagle	2023	7	8	2108	1029
Golden eagle	2024	2	2	661	391
Goshawk	2023	1	1	366	171
Merlin	2023	1	1	8	0
Golden plover	2023	7	12	205	45
Golden plover	2024	2	3	78	0
Dunlin	2024	1	5	540	540
Greenshank	2023	5	8	249	0

Target species: At-risk flights

- 9.104 Of the Caithness and Sutherland Peatlands SPA, Ramsar and SSSI qualifying species, although flights were recorded within the viewsheds, there were no 'at risk' flights for merlin, dunlin or golden plover recorded over the 23 months VP surveys. The only SPA/Ramsar Site qualifying species with 'three or more at risk' flights was therefore golden eagle, with flights recorded in the breeding and non-breeding seasons, as detailed in Technical Appendix 9.2 and given in Table 9.12.
- 9.105 The other target species with sufficient 'at risk' flight activity for CRM to be merited was white-tailed eagle, as given in Table 9.13.
- 9.106 Given the absence of, or very limited 'at risk' flight activity, collision risk from the proposed development to all other species is negligible. Further details are given in Technical Appendix 9.2.

Table 9.12: All 'at-risk' golden eagle flights recorded during flight activity surveys

VP	Date	Time	Number of birds	Duration (seconds)	Duration of flight at RSH (seconds)	% within WP/ viewshed (%)	Total duration at RSH within WP/viewshed (seconds)
1	11/01/2023	09:09	1	65	65	27.7	18
1	26/02/2023	15:11	1	162	147	0	0
1	23/08/2023	14:53	1	266	0	7.8	0
1	27/10/2023	09:12	1	69	0	7.7	0
1	26/02/2024	13:33	1	421	286	0	0
2	15/03/2023	15:31	1	407	317	49.1	156
2	13/06/2024	10:37	1	240	105	62.2	65
3	15/02/2023	13:58	1	185	0	0	0
3	15/02/2023	14:56	1	233	0	89.7	0
3	23/03/2023	13:36	1	230	60	0	0
3	23/03/2023	13:40	2	625	505	0	0
3	15/12/2023	12:24	1	463	0	0	0
3	25/01/2024	11:31	1	39	39	46.9	18

Table 9.13: All 'at-risk' white-tailed eagle flights recorded during flight activity surveys

VP	Date	Time	Number of birds	Duration (seconds)	Duration of flight at RSH (seconds)	% within WP/ viewshed (%)	Total duration at RSH within WP/viewshed (seconds)
1	08/12/2022	10:55	1	190	145	30.3	44
1	01/08/2024	10:41	1	170	155	0	0
2	13/05/2023	09:33	1	63	0	20.1	0
2	14/09/2023	13:27	2	195	0	77.0	0
2	07/03/2024	13:25	3	67	0	95.9	0

VP	Date	Time	Number of birds	Duration (seconds)	Duration of flight at RSH (seconds)	% within WP/viewshed (%)	Total duration at RSH within WP/viewshed (seconds)
2	07/03/2024	13:40	2	217	217	100.0	434
3	21/04/2023	13:11	1	616	616	68.0	419
3	21/04/2023	13:11	1	1090	895	4.4	40
3	21/04/2023	13:16	1	255	255	9.6	24
3	27/03/2024	15:42	1	24	0	100.0	0
1	08/12/2022	10:55	1	190	145	30.3	44

Secondary species

- 9.107 Raven were the most common secondary species recorded within the combined viewsheds of VPs 1, 2 and 3 over the 23-month survey period. They were present in most months, with one or two birds observed. Buzzard were recorded every few months and kestrel and sparrowhawk only once or twice. Two mallard and two heron flights were also recorded. There were no gull species observed within the viewsheds.

Incidental records

- 9.108 There were no incidental records of note recorded during the baseline bird surveys for the proposed development.

Breeding Diver Survey Results

- 9.109 No red-throated divers were recorded breeding within 2km of the proposed development site, and the absence of breeding was further evidenced by the very limited flight activity recorded over the 2023 and 2024 breeding seasons (Tables 9.11). Only one flight was recorded in two years, from VP2 on 13th April 2023. Red-throated diver were only encountered once, on a lochan over 0.6km west of the proposed development (NC44044 24079). As no red-throated divers were recorded on any subsequent surveys, it is concluded there are no breeding red-throated divers or actively used breeding lochans within 2km of the proposed development, including in the adjacent Caithness and Sutherlands Peatlands SPA/Ramsar Site.
- 9.110 Black-throated divers were occasionally recorded on Loch Shin but there was also no evidence of breeding within 2km of the proposed development. Only one flight was recorded in two years, from VP2 on 16th May 2024 (Table 9.11), albeit it at collision risk height and within the turbine envelope. Evidently, this diver species does not breed within 2km of the proposed development and makes negligible use of the air space within and around the proposed development.

Breeding Raptor Survey Results

- 9.111 Of the Caithness and Sutherland Peatlands SPA raptors, no golden eagle eyries were identified within the 6km survey buffer around the Site. HRSG records give the nearest territory well beyond this distance. This pair fledged one chick in 2020 but there was no nesting attempt found in 2021 or 2022, and the territory was not checked by the HRSG in 2023 or 2024. No other territories were reported in the wider area. The location of the 2020 eyrie is shown in Figure CA9.7 of the Confidential Technical Appendix 9.3.
- 9.112 A merlin territory was located approximately 0.35km north of the proposed development in 2023 during this survey. A food pass was recorded on 18th April 2023 but there was no further merlin seen during May, June or July, with just one further sighting in 2023 during VP surveys of a single bird in flight to the west of the site. There were no merlin recorded in 2024, and neither the HRSG nor RSPB had records of this species within 2km of the proposed development. The location of the merlin sighting is also shown in Figure CA9.7 of the Confidential Technical Appendix 9.3
- 9.113 Other than golden eagle and merlin, no other SPA-qualifying raptor species were recorded within 2km of the proposed development, either during survey work or desk study information.
- 9.114 Only two other target raptor species were recorded.
- 9.115 As shown in Figure 9.6a, and Tables 9.10, 9.10 and 9.13, there was some white-tailed eagle flight activity recorded in both breeding and non-breeding periods.
- 9.116 Whilst white-tailed eagles are not as reliant on up-draughts as golden eagle for flight activity, a relatively high proportion of flight activity was outside the turbine envelope, associated with slopes to the east and north-west of the proposed development. Of the 10 flights recorded over the October 2022 to August 2024 period, seven were of single birds, with two birds recorded once in September 2023, once in March 2024 (an apparent pair) and on that same day, one flight of three birds (two adults and an immature). No white-tailed eagle nests were recorded within the 6km survey area around the site, and neither the HRSG nor RSPB had records of white-tailed eagle within 6km of the proposed development. On the basis of these combined survey and desk study findings, the proposed development and surrounding buffer do not hold breeding white-tailed eagle.
- 9.117 Osprey flight activity was extremely infrequent, with only four flights recorded over two years' VP surveys. Osprey did not nest within the 2km survey buffer in either 2023 or 2024, and neither the HRSG nor RSPB had records of this species within this buffer. It is concluded from these results that the proposed site and its 2km buffer are of negligible importance for this species.

Black Grouse Surveys

- 9.118 Black grouse surveys were carried out in 2023 and 2024 covering suitable habitat out to a 1.5km buffer of the proposed development. One lek of a single male was recorded in 2023, approximately 0.9km east of the proposed development, the location of which is shown in Figure CA 9.7 in Technical Appendix 9.3:Confidential Annex. No black grouse were

recorded lekking in 2024, and there were no black grouse flights recorded during the October 2022 to August 2024 VP survey period. The RSPB data search did not return any lek locations within a 2km data search area. It is therefore concluded that the proposed development and its 1.5km buffer are of negligible importance for this species.

Moorland Breeding Bird Surveys (including territory mapping)

- 9.119 Across all eight Breeding Bird Survey visits (four in 2023 and four in 2024) a total of four breeding wader species were recorded, and one duck species (teal). The total number of putative territories is given in Table 9-14 and putative territory centres are mapped on Figure 9.4 for 2023 and Figure 9.5 for 2024.
- 9.120 As can be seen, the wader and wildfowl territories are all distributed to the west of the site, within the Caithness and Sutherland Peatlands SPA/Ramsar Site and the Strath Duchally SSSI. This reflects the differences in habitats in this area, which is dotted with lochans and bog pools, and therefore more optimal habitat for these species than on site or elsewhere in the 500m survey buffer around the Site.

Table 9.14: Wader and Wildfowl Territories 2023 and 2024

Species	SPA/Ramsar Qualifying Species or SSSI Feature	Year	No. Territories Within 500m Survey Buffer	No. Territories Within 500m of Wind Farm Infrastructure
Golden plover	Caithness and Sutherland Peatlands SPA/Ramsar Site and the Strath Duchally SSSI	2023	4	0
		2024	4	2
Dunlin	Caithness and Sutherland Peatlands SPA/Ramsar Site and the Strath Duchally SSSI	2023	1	0
		2024	1	0
Greenshank	Caithness and Sutherland Peatlands SPA/Ramsar Site and the Strath Duchally SSSI	2023	3	0
		2024	0	0
Teal	Included as 'Noteworthy Fauna' on Caithness and Sutherland Peatlands Ramsar Site Information Sheet.	2023	0	0
		2024	1	0
Snipe	BoCC5 = Amber-list	2023	1	1
		2024	0	0

Collision Risk Modelling Results

- 9.121 Based on the results of October 2022 to August 2024 VP survey results, CRM has been carried out for those species for which there are more than three 'at-risk' flights (flights within the turbine envelope at Potential Collision Height) within any of the two non-breeding or breeding seasons.
- 9.122 The identification of the species for which collision risk assessment was needed, and the CRM method and calculations are all provided in Technical Appendix 9.2.

- 9.123 CRM was completed for two species, namely golden eagle and white-tailed eagle. Given the lack of 'at risk' flights recorded by other species, flight activity data show that the collision risk to all other species from the proposed development would be negligible.
- 9.124 For golden eagle, the CRM modelling predicts a collision rate of 0.03 birds/year, equivalent to one golden eagle every 33 years (therefore approximately one golden eagle over the 35-year lifetime of the proposed development). As explained in Section 4.1 of Technical Appendix 9.2, to attempt to account for variation in flight activity and the inherent uncertainty in the CRM, assuming 100% variability in at risk flight activity and a 20% margin to account for uncertainty in the NatureScot model, the collision risk estimates for golden eagle may therefore be reasonably considered to vary by ± 1.2 , and 0.00 - 0.07 birds/year, equating to no collisions to a maximum of one golden eagle every 15 years (or two over the lifetime of the wind farm).
- 9.125 For white-tailed eagle, the CRM predicts a collision rate of 0.31 birds/year, equivalent to one white-tailed eagle every 3.2 years. Applying the same treatment of flight variation and uncertainty as with golden eagle, the CRM, the predicted collision rate for white-tailed eagle was 0.00 - 0.69 birds/year, equivalent to no collisions to a maximum of one white-tailed eagle every 1.5 years, or approximately 23 over the lifetime of the wind farm.
- 9.126 An alternative scenario based on WindPRO data as advised by the client has also been applied, with 40% operational time (60% down-time), as opposed to the 85% standard operational time (15% down-time) as recommended in the collision modelling guidance^{6,7,8}.
- 9.127 The predicted collision rates under the 40% operational time scenario are as follows. For golden eagle the CRM predicts a collision rate of 0.01 birds/year (one bird every 71 years). For white-tailed eagle the CRM predicts a collision rate of 0.15 birds/year (one bird every 6.8 years).

Identification and Evaluation of Key Effects

Potential Effects on Birds from Wind Farms

- 9.128 There are three main ways in which onshore wind farm development can have adverse impacts on wild bird populations (Drewitt and Langstone 2006):-
- Direct habitat loss as a result of wind farm construction;
 - Displacement of birds from their habitat because of disturbance from wind farm construction, operation or decommissioning; and

⁶ Band, W (2024). Using a collision risk model to assess bird collision risks for onshore wind farms. NatureScot Commissioned Report No. 909

⁷ NatureScot (2024). Guidance on using an updated collision risk model to assess bird collision risk at onshore wind farms. NatureScot Guidance Note. <https://www.nature.scot/doc/guidance-using-updated-collision-risk-model-assess-bird-collision-risk-onshore-wind-farms>

⁸ NatureScot (2025). Wind farm impacts on birds - Use of Avoidance Rates in the NatureScot Wind Farm Collision Risk Model. Updated: March 2025. <https://www.nature.scot/doc/wind-farm-impacts-birds-use-avoidance-rates-naturescot-wind-farm-collision-risk-model>.

- Collision with rotating turbine blades or other structures associated with wind farms.

9.129 As noted previously, cumulative effects may arise as a result of the combined effects of multiple developments affecting the same bird population or designated site.

The Nature Conservation Importance of the Site and its Survey Buffers for Birds

- 9.130 The baseline results from the combined desk study and baseline survey data have been used to assess the nature conservation importance of the proposed development and its survey buffers for birds.
- 9.131 This has been done to inform the impact assessment and HRA, and is important given the proximity to the Caithness and Sutherland Peatlands SPA and Ramsar Site, as well as the Flow Country WHS.

Species Considered of International Conservation Importance

- 9.132 Consideration has been given the importance of the site and survey buffers for species of international importance, namely those that are qualifying interests of the Caithness and Sutherlands Peatlands SPA and Ramsar Site. The outcome of this assessment is summarised in Table 9.15.

Table 9.15: Bird species considered of international importance in the assessment

Target Species	Species conservation value ¹	Species Importance for the Site	Justification
Red-throated diver	Annex I Schedule I BoCC5 = Green-list	International	No breeding pairs within 2km from surveys and desk study. One flight (one bird)) during VP surveys (from Oct. 2022 to August 2024). Therefore:- No connectivity with designated population <1% of estimated UK/GB breeding population <1% of regional population (NHZ 5) of 1 breeding pairs Nonetheless, categorised as of international nature conservation importance as a precaution.
Black-throated diver	Annex I Schedule I BoCC5 = Amber-list	International	No evidence of breeding. Only one flight (one bird) during VP survey (from Oct. 2022 to August 2024). No connectivity with designated population <1% of estimated UK/GB breeding population <1% of regional population (NHZ5) Nonetheless, categorised as of international nature conservation importance as a precaution.

Target Species	Species conservation value ¹	Species Importance for the Site	Justification
Golden eagle	Annex I Schedule I SBL BoCC5 = Green-list	International	No breeding pairs within 6km from surveys and desk study. No roosting birds observed within the proposed development or within 2km or 6km. 10 flights in 2022/2023 (9 single birds, 1 of 2 birds). 3 flights in 2024 (all single birds) during VP surveys (from Oct. 2022 to August 2024). Therefore:- No connectivity with designated population <1% of estimated UK/GB breeding population <1% of regional population (NHZ 5) Nonetheless, categorised as of regional nature conservation importance as a precaution.
Merlin	Annex I Schedule I BoCC5 = Red-list	International	One breeding attempt within 2km from surveys and desk study. One flight in 2023 (single bird) during VP surveys (from Oct. 2022 to August 2024). Therefore:- No connectivity with designated population <1% of estimated UK/GB breeding population <1% of regional population (NHZ 5)
Golden plover	Annex I BoCC5 = Green-list	International	Two putative breeding territories within 500m of the proposed development in 2024. None in 2023. Therefore:- Connectivity with designated population <1% of estimated UK/GB breeding population <1% of regional population (NHZ5)
Dunlin	BoCC5 = Red-list	International	No putative breeding territories within 500m of the proposed development in 2023 or 2024. Therefore:- Connectivity with designated population <1% of estimated UK/GB breeding population <1% of regional population (NHZ5)
Greenshank	Schedule I BoCC5 = Amber-list	International	No putative breeding territories within 500m of the proposed development in 2023 or 2024. Therefore:- Connectivity with designated population <1% of estimated UK/GB breeding population <1% of regional population (NHZ5)

9.133 Taking a precautionary approach, given the proposed development's footprint and relevant buffer areas showed only limited activity, the qualifying species that it is deemed there are potential significant effects from the proposed development, and which are taken forward for assessment are golden eagle, merlin, golden plover, dunlin and greenshank. These are assessed below.

9.134 The evaluation and assessments of species of regional importance (white-tailed eagle and black grouse) and local important follow on after these internationally important species.

Potential Effects of the Proposed Development on Golden Eagle

Status of golden eagle population and constraints

- 9.135 Golden eagle is Green-listed by BoCC⁵ and currently has favourable conservation status in the UK.
- 9.136 The most recent national survey of golden eagle (carried out in 2015) identified 508 breeding pairs in the UK, representing an increase of 16.4% between 1992 and 2015 and 14.9% between 2003 and 2015 (Hayhow *et al.* 2017). Woodward *et al.* (2020) provide the slightly up-dated Scottish breeding population of 510 pairs.
- 9.137 Within the national survey's Northern Moors and Flows region (Hayhow *et al.* 2017), within which the proposed development lies, the number of golden eagle breeding pairs has fluctuated but generally increased, with:-
- 22 breeding pairs recorded in the 1982/1983 survey;
 - 16 pairs in 1992;
 - 21 pairs in 2003; and
 - 29 pairs in 2015.
- 9.138 For the Peatlands of Caithness and Sutherland NHZ area, the estimate is 18 pairs based on 2003 data (Wilson *et al.* 2015).
- 9.139 Forrester *et al.* (2012) provide an estimate of the wintering golden eagle population in Scotland being c.1,000 individuals.
- 9.140 Although pre-dating the most recent national survey of golden eagle, the Golden Eagle Framework (Whitfield *et al.* 2002, 2008) assesses the conservation status and constraints on golden eagle populations in the NHZ areas of Scotland. This assessment is based on three criteria to assess favourable conservation status for golden eagles; the number of occupied territories, breeding performance, and the proportion of suitable habitat which is occupied.
- 9.141 The Golden Eagle Framework assessed the population of NHZ5 as unfavourable (Amber), by failing in one of the three criteria. The criterion failed was territory occupancy, which was slightly below target, (the number of occupied territories being 13 (in 1992) and 18 (in 2003) compared to the target of 21) but the productivity and population growth criteria were met.
- 9.142 For NHZ5, the summarised likely constraints on favourable condition were (in order of importance) persecution, sheep grazing (which results in fewer grouse and hare available as prey for eagles - live prey being very important for successful breeding), wind farms and nest site availability.
- 9.143 Although there were no golden eagle territories within the 6km survey buffer, and the closest territory identified (at 7km from the proposed development) was outside the potential connectivity distance with the Caithness and Sutherland Peatlands SPA/Ramsar site, the species has been treated as internationally important for conservation, as a

precaution, as golden eagles are a SPA qualifying species. The golden eagle territories that are within or have connectivity to the SPA are, however, all well beyond the potential connectivity distance.

Construction effects on golden eagle

Habitat loss/change effects on golden eagle during construction

- 9.144 The extent of suitable golden eagle habitat loss from the construction phase of the proposed development will be minimal. This is because the area over which construction activity will take place is negligible compared to habitat available within the golden eagle ranges in this region, and because the development footprint is already in unsuitable habitat for this species (as non-native conifer plantations are of negligible foraging, roosting or nesting use by this species) (Whitfield *et al.* 2002, Fielding *et al.* 2020). As detailed in Technical Appendix 9.4, there is also no above average suitable topography for golden eagle foraging within the site (see Golden Eagle Topographical (GET) model details below). Therefore, habitat loss due to construction is of **negligible** magnitude and **not significant**.

Disturbance/displacement effects on golden eagle during construction

- 9.145 Published recommended buffer distances for breeding UK golden eagle to avoid disturbance are 750-1,500m (McGrady *et al.* 1997) and 900-1,100m (Petty 1998). The review by Goodship and Furness (2022) collated this and subsequent evidence and concluded disturbance distances to people on foot of 750-1,000m for the breeding season and 250-500m for the non-breeding season.
- 9.146 Given the nearest golden eagle eyrie is over 7km away from the development footprint, there is therefore clearly no risk of disturbance to breeding activity. There were no roosts identified in closer proximity and flight activity of this species in proximity to the development footprint in low. Therefore, the potential disturbance effects on breeding golden eagle during construction are assessed as a **negligible** magnitude of change and **not significant**.

Operational effects on golden eagle

Disturbance/displacement effects on golden eagle during operation

- 9.147 The displacement and resultant loss of foraging habitat for golden eagle by operational wind farms has been comprehensively researched in Scotland within the last 10 years, resulting in a series of published satellite tagging studies by Alan Fielding, Phil Whitfield, Dave Anderson and co-workers (Whitfield *et al.* 2017, Fielding *et al.* 2017, 2021, 2022, 2023, 2024a, 2024b). Results consistently show golden eagles generally avoid wind farms by flying around them, and the relatively few birds that cross wind farms tend to increase flight height to cross rapidly over above rotor swept height. The extent of displacement has

been shown to be in the region of 300m from the outer turbines of wind farms (Fielding *et al.* 2024b).

- 9.148 In addition, data from satellite tagging of territory holding adult birds, and by previous data from tagged, dispersing, juvenile birds, has greatly improved understanding of golden eagle movements and range use. The resulting GET model, has been developed, based on a considerable and growing data set on the movements of satellite tagged golden eagles (Fielding *et al.* 2019, 2020). This categorises the Scottish landscape into categories of suitability for golden eagle flight activity, and therefore, by inference, suitability for foraging. This allows an assessment to be made of the relative impact on golden eagles of displacement from foraging habitat by operational wind farms.
- 9.149 To support the assessment of the impacts of the proposed development on golden eagle therefore, an analysis of potential displacement effects on golden eagle was commissioned by the application from Alan Fielding (the lead author of the GET model). This assessment is provided in Confidential Technical Appendix 9.4 quantifies the impact of golden eagle displacement from the proposed development. This analysis concluded the small loss from displacement of 300m would not result in a significant impact on the extent of habitat used by any local golden eagle pairs. The evidence presented demonstrates it is also extremely unlikely that there will be a significant impact on dispersing young eagles or that the proposed development would be a barrier to golden eagle movements. Consequently, there would not be a significant reduction of habitat use outside of the 300m turbine exclusion zone.
- 9.150 The potential effect of displacement from foraging habitat of breeding golden eagle from the eyrie over 7km north of the proposed development (and therefore outside and not associated with the Caithness and Sutherland Peatlands SPA/Ramsar Site) is therefore concluded to be of **negligible** magnitude and **not significant**.
- 9.151 The nearest golden eagle breeding territory out of those five pairs within the Caithness and Sutherland Peatlands SPA/Ramsar Site is even further away than 7km from the proposed development. It is therefore also clear that there would be no impact from operational displacement on this qualifying interest and its conservation objectives, and therefore no adverse effect on the SPA/Ramsar Site.

Collision risk to golden eagle during operation

- 9.152 Despite the observed tendency for golden eagle to avoid operational wind farms (discussed above), avoidance rate at Scottish wind farms is not 100 per cent. There are therefore instances of golden eagle collisions with wind farm infrastructure, with six collisions known to date, the latest being at Windy Rig Wind Farm in south Scotland in November 2024⁹. At European wind farms. Dürr (2021) reports that, as of May 2021, there has been a total of 23 golden eagle deaths at European wind farms, (12 in Sweden, eight in Spain, two in Norway and one in Germany).
- 9.153 The CRM undertaken for the proposed development is detailed in Technical Appendix 9.2, and as summarised in paragraphs 9.125 and 9.127 above, the CRM gives a predicted

⁹ For details of this fatality, see [Sparky \(B31\) - Sad News from Galloway](#)

collision rate of 0.03 birds/year, equivalent to one golden eagle every 33 years (therefore approximately one golden eagle over the 35-year lifetime of the proposed development). Taking account for of variation in flight activity and the inherent uncertainty in the CRM, assuming 100% variability in at risk flight activity and a 20% margin to account for uncertainty in the NatureScot model, this collision rate for golden eagle could vary between 0.00 and 0.07 golden eagles a year, i.e. between zero collisions over the lifetime of the proposed development to one golden eagle every 15 years (or two over its lifetime). Under the 40% operational time scenario, this equates to a range of 0 – 0.03 birds per year.

- 9.154 This level of additional mortality would not cause long-term decline in the NHZ population.
- 9.155 The potential collision effects of breeding golden eagle during operation are assessed as of **minor** magnitude and **not significant**.

Decommissioning effects on golden eagle

Disturbance/displacement effects on golden eagle during decommissioning

- 9.156 It is predicted that the effects of disturbance on breeding golden eagle during decommissioning will be of a similar level to those experienced during construction and therefore effects are predicted to be of the same level, namely **negligible** magnitude and **not significant**.

Summary of potential effects on golden eagle

- 9.157 From desk studies and baseline data, the proposed development and the 6km survey buffer for this species are considered to be nationally important for golden eagle. Given the magnitude of effects predicted to result from the construction, operation and decommissioning of the proposed development, Table 9.16 summarises the significance of predicted effects on this species.

Table 9.16: Summary of assessment of potential effects on golden eagle

Phase	Effect	Potential magnitude of change	Significance
Construction	Habitat loss/modification	Negligible	Negligible: Not significant
Construction	Disturbance/displacement	Negligible	Negligible: Not significant
Operation	Disturbance/displacement	Negligible	Negligible: Not significant
Operation	Collision	Minor	Minor: Not significant
Decommissioning	Disturbance/displacement	Negligible	Negligible: Not significant

Potential Effects on Breeding Dunlin

Status of dunlin

- 9.158 Dunlin is Red-listed in BoCC5. The Red-list status is primarily due to severe declines in the wintering population (>50%). It is not a Schedule 1 or Annex 1 species.
- 9.159 The most recently assessed UK UK/GB breeding population of dunlin is 8,600-10,500 pairs. The regional population (NHZ5 The Peatlands of Caithness and Sutherland) is 2,196 pairs (Wilson *et al.* 2015). Woodward *et al.* (2020) give the Scottish population as between 8,000-10,000 breeding pairs (*schinzii* subspecies). The species is not present in or around the proposed development or the Caithness and Sutherland Peatlands SPA/Ramsar site or Strath Duchally SSSI over the non-breeding season, as it is migratory and coastal in its winter distribution.
- 9.160 From the desk study and two years' breeding bird surveys, there was one dunlin breeding territory in the survey area in 2023 and 2024, both within the adjacent Caithness and Sutherland Peatlands SPA but beyond 500m of the proposed development. As dunlin are a SPA qualifying species, the species is judged to be of international significance in the assessment, as a precaution.

Construction effects on dunlin

Habitat Loss/change effects during construction on dunlin

- 9.161 The development footprint occupies conifer plantation and is not suitable for breeding or foraging dunlin. As is evident from the two years' breeding bird surveys results, none of the residual modified bog or heathland within the conifer plantation rides were used by breeding dunlin either. Therefore, the proposed development will not lead to any loss of habitat on which nesting and chick-rearing dunlin depend.
- 9.162 There would be no direct loss of breeding dunlin habitat during construction. The magnitude of habitat effects would therefore be **negligible** and **not significant**.

Disturbance/displacement effects during construction on dunlin

- 9.163 Specific studies on disturbance to dunlin from construction activity are lacking but following a review of evidence on disturbance to breeding dunlin from pedestrians, the buffer recommended was up to 200m (Goodship and Furness 2022). Applying this disturbance buffer for the assessment of effects of construction is considered precautionary, given birds are more sensitive to people out in the open than to vehicles, and that most construction activity will be screened by the remaining *in situ* conifer plantation (see Chapter 14: Other Issues (including Forestry)).
- 9.164 The baseline surveys for the proposed development identified two dunlin territories, both of which were more than 500m from the development footprint (Figures 9.4 and 9.5).
- 9.165 The potential disturbance effects on breeding dunlin during construction are therefore predicted to be of **negligible** magnitude and therefore **not significant**.

Operational effects on dunlin

Disturbance/displacement effects during operation on dunlin

- 9.166 Pearce-Higgins *et al.* (2012) reported that dunlin were unaffected by the presence of wind farms, with no evidence of displacement effects. Humphreys *et al.* (2012) noted that one study alone was not necessarily conclusive that dunlin did not exhibit displacement effects, but there has since been further post-construction monitoring at several other wind farms in North Scotland, assessing potential disturbance/displacement effects. These confirm dunlin continue to nest in areas of suitable habitat for at least five years after wind farm construction.
- 9.167 Also of relevance is the research into effects of conifer plantations on the abundance, distribution and breeding success of waders. Based on this latter evidence, the current baseline reflects a degree of displacement of dunlin away from the edge of the conifer plantation, with the displacement thought to be a result of increased predation pressure nearer to the plantation edge (e.g. Thompson *et al.* 1988, Stroud *et al.* 1990, Lavers *et al.* 1997).
- 9.168 Wilson *et al.* (2014) also studied this edge-effect, specifically within the Caithness and Sutherland SPA (at Forsinard Flows) and found that proximity to conifer plantations had adverse impacts on breeding dunlin over distances of up to 700m. This is significantly further than the potential 100-200m disturbance buffer recommended by NatureScot (in Goodship and Furness 2022).
- 9.169 It is therefore assessed, that given the pre-existing potential displacement that plantation forestry has already caused, plus the distance to optimal dunlin habitat from the proposed development, and the distance of the development footprint to the dunlin territories present in 2023 and 2024, and the findings of Pearce-Higgins *et al.* (2012), the conclusion can be reached that there will be no displacement of breeding dunlin by the proposed development.
- 9.170 Therefore, no dunlin territories are predicted to be displaced, so the magnitude of change from the current baseline is **negligible** and the predicted effect on this SPA-qualifying species is **not significant**.

Collision risk to Dunlin during operation

- 9.171 The map of bird sensitivities to wind farms in Scotland¹⁰ state that male dunlin present a collision risk factor during the breeding season due to their frequent display flights at 10-50m. However, considering the proximity of many European wind farms to breeding dunlin, although likely to be under-reported due to the species' small size and cryptic colouration, records of collision fatalities are rare. Dürr (2021) reports that, as of May 2021, there has been a total of four dunlin deaths at European wind (three in Germany and one in Netherlands).

¹⁰ Bright, J., Langston, R., Bullman, R, Evans, R., Gardner, S. And Pearce-Higgins, J. (2008). Map of bird sensitivities to wind farms in Scotland: A tool to aid planning and conservation. *Biological Conservation* 141: 2342-2356.

9.172 During two years' flight activity surveys for the proposed development, only one flight was recorded, to the west of the proposed development, over wetter and therefore optimal habitat for this species. No 'at risk' dunlin flights were therefore recorded, a fact that reflects the unsuitable habitat within the proposed development and CRM buffer. Collision risk to this species from the proposed development is therefore zero, based on the survey results.

9.173 Therefore, the predicted magnitude of change to breeding dunlin from collisions is **negligible** and **not significant**.

Decommissioning effects on dunlin

Disturbance/displacement effects on dunlin during decommissioning

9.174 It is predicted that the effects of disturbance on breeding dunlin would be no more than during construction, and therefore **negligible and not significant**.

Significance of potential effects on dunlin

9.175 From desk studies and baseline data, the proposed development and the 500m survey buffer for this species are considered to be internationally important for dunlin.

9.176 Given the magnitude of effects predicted to result from the construction, operation and decommissioning of the proposed development, there are **no significant effects** predicted from the proposed development, as summarised in Table 9.17.

Table 9.17: Summary of assessment of potential effects on dunlin

Phase	Effect	Potential magnitude of change	Significance
Construction	Habitat loss/modification	Negligible. No suitable habitat lost or modified.	Minor: Not significant
Construction	Disturbance/displacement	Negligible. Single territory well beyond potential disturbance distance.	Minor: Not significant
Operation	Disturbance/displacement	Negligible. Single territory well beyond potential disturbance distance.	Minor: Not significant
Operation	Collision	Negligible. No at-risk flights.	Minor: Not significant
Decommissioning	Disturbance/displacement	None. Single territory well beyond potential disturbance distance.	Minor: Not significant

Potential Effects on Breeding Golden Plover

Status of golden plover

9.177 Golden plover is Green-listed in BoCC5. It is not on Schedule 1 but is an Annex 1 species.

- 9.178 The Scottish breeding golden plover population has been estimated as 37,480 pairs (Wilson *et al.* 2015). A steady population decline, and range contraction took place across Scotland (Humphreys *et al.* (2015) but between the last five to ten years there has been a slight recovery¹¹.
- 9.179 Longer term however, the distribution of golden plover in Britain is predicted to be severely reduced by climate change (Huntley *et al.* 2007), as is its typical blanket bog habitat (Ritson *et al.* 2025, Pearce-Higgins *et al.* 2005, Pearce-Higgins *et al.* 2010, Gallego-Sala *et al.* 2010). Climate warming may reduce the abundance and availability of adult tipulids, leading to reduced breeding success, and significant predicted population declines and increased risk of extinction, particularly in the south of its UK range (Pearce-Higgins *et al.* 2005). However, habitat management could mitigate this risk, either by reducing the negative effects of a warmer climate on crane flies (e.g. by increasing soil moisture through decreased drainage) or through a compensatory mechanism such as reduced nest predation or increased adult survival (Pearce-Higgins 2011, Carroll *et al.* 2011).
- 9.180 The population and distribution trends for golden plover within the Caithness and Sutherland Peatlands SPA/Ramsar Site have recently been assessed by NatureScot, from monitoring in 2004, 2009, 2015 and 2023 (Ward 2024). Results showed breeding territory density declined by 33% between 2004 and 2009, recovered partially in 2015 (to 24% lower than 2004), with a further small increase in 2023 (to 21% lower than 2004).
- 9.181 As golden plover are a SPA qualifying species, the species is judged to be of international significance in the assessment.

Construction effects on golden plover

Habitat Loss/change effects during construction on golden plover

- 9.182 The proposed development's footprint occupies conifer plantation and is not suitable for breeding or foraging golden plover. As is evident from the two years' breeding bird surveys results, none of the residual modified bog or heathland within the conifer plantation rides were used by breeding golden plover either.
- 9.183 There would be no direct loss of breeding golden plover habitat during construction. The magnitude of habitat effects would therefore be **negligible** and **not significant**.

Disturbance/displacement effects during construction on golden plover

- 9.184 Examination of the 2023 putative territory distribution (Figure 9.4) shows no territories would be at risk of displacement from these locations, being well beyond the 500m potential disturbance distance identified in NatureScot guidance.

¹¹ See <https://www.bto.org/our-science/projects/breeding-bird-survey/latest-results/population-trend-graphs>

- 9.185 The distribution of the 2024 putative territory centres (Figure 9.5) shows two of the four territories would be within 500m of the nearest turbines.
- 9.186 Details of distances between the proposed development and 2023 and 2024 putative territory centres are given in Table 9.18. In each year, territories are numbered from north to south.
- 9.187 For both 2023 and 2024, all territories were within the Caithness and Sutherland Peatlands SPA/Ramsar Site and the Strath Duchally SSSI.

Table 9.18: Distribution of 2023 and 2024 golden plover territories in relation to nearest forest edge and nearest turbine from the proposed development (to nearest 10m)

2023 Territories	Forest Edge (m) (Site plantation/ Other Plantation)	Nearest Turbine (m) (Turbine No.)	Comparison to Published Displacement Distances
GP Territory 1	1300/870	1620 (T1)	Forest edge effect 400m to 700m (Stroud <i>et al.</i> 1990, Wilson <i>et al.</i> 2014) Windfarm displacement effect 0m to 500m (Pearce Higgins <i>et al.</i> 2009, Douglas <i>et al.</i> 2011, Sansom <i>et al.</i> 2016a)
GP Territory 2	980/600	1450 (T3)	
GP Territory 3	580/800	700 (T5)	
GP Territory 4	780/380	850 (T5)	
2024 Territories	Forest Edge (m) (Site plantation/ Other Plantation)	Nearest Turbine (m) (Turbine No.)	
GP Territory 1	230/1,770	360 (T1)	
GP Territory 2	450/1,170	910 (T1)	
GP Territory 3	630/680	710 (T5)	
GP Territory 4	300/200	400 (T10)	

- 9.188 Construction of the proposed development would take place completely within the existing conifer planation and therefore be shielded from golden plover putative territory locations, other than T3 and T12 which are close to the plantation edge. None of the 2023 or 2024 putative breeding centres were within 500m of either of these turbines. In light of this, it is concluded that displacement of either territory is highly unlikely (even if construction of those turbines took place in the April to July breeding season). The fact that the local topography would also screen site workers from birds on these territories adds further weight to this assessment.
- 9.189 Humphries *et al.* (2015) reviewed the studies investigating the effects of wind farm construction on golden plover. Of most relevance, given its relative geographic proximity, was research at Gordonbush Wind Farm, Sutherland which examined the effects of wind farm development on the breeding abundance, distribution and breeding success of golden plover (Samson *et al.* 2016). Territories were mapped before, after and during wind farm construction (with comparison to a control site) and from comparisons, it was concluded construction activity had no significant effect on golden plover breeding abundance or distribution.
- 9.190 On the basis of baseline survey results over two breeding seasons, and desk study data, including insights from other wind farm construction in north Scotland, and the screening

in place from the conifer plantation, potential disturbance on breeding golden plover during construction is of **negligible** magnitude and **not significant**.

Operational effects on Golden Plover

Disturbance/displacement effects during operation on golden plover

- 9.191 A number of studies investigating the effects of wind farm operation on golden plover populations before, during and after wind farm construction have been undertaken in Scotland. Pearce Higgins *et al.* (2009) found significant reductions in densities of breeding golden plover in the vicinity of operational wind farms (by 38.9% within 500m of turbine array). However, a later study by the same authors found no difference in abundance or distribution as a result of an operational wind farm when compared to a control site (Douglas *et al.* 2011). The most recent study (Sansom *et al.* 2016a) concluded golden plover actively avoid wind farms at distances of up to 400m.
- 9.192 The Samson study **Error! Bookmark not defined.** concluded that the reduction of breeding golden plover was not due to mortality from collision with turbines, nor due to changes in habitat arising from wind farm construction. it also concluded that it was unlikely to be due to a response from turbine disturbance (as there was no significant response to the high level of disturbance experienced by golden plovers during construction). Rather, the authors concluded that the observed decline was due to a behavioural response to the crowding effect of turbines. The effect of turbine crowding increases the perceived predation risk for golden plover, as it reduces their ability to detect predators. Notably, the study concluded that the displaced golden plover did not simply redistribute to the nearest distance where the effects of the wind farm were reduced to acceptable levels but instead were displaced to considerable distances from the operational wind farm. Hence, the study concluded that golden plover were displaced by distances of up to 400m from the operational wind farm.
- 9.193 This negative response by golden plover to tall turbines within the landscape is believed to be similar to the observed responses of golden plover and other peatland waders to planted conifer woodland in Sutherland. Given that the proposed development is entirely within a pre-existing conifer plantation, this is an important consideration when assessing the risk of it causing displacement of breeding waders.
- 9.194 Stroud *et al.* (1990) found, at study sites mainly in Sutherland, that golden plover numbers declined at distances up to 400 m from forestry edge. Wilson *et al.* (2014) studied this edge-effect within the Caithness and Sutherland SPA (at Forsinard Flows) and found that proximity to conifer plantations had adverse impacts on breeding golden plover over distances of up to 700m, with research by Hancock *et al.* (2020) finding evidence that mammalian predators were at least partly responsible for the low densities of breeding waders close to forests, on adjacent open bogs.
- 9.195 On the basis of current knowledge therefore, and taking a slightly more precautionary displacement distance for golden plover from windfarms than the 400m found by the Samson study, a displacement distance of 500m from turbines for upland/peatland waders is used in this assessment. Applying this distance, this would lead to the potential

displacement of two breeding territories (based on the 2024 breeding distribution) or none (based on the 2023 golden plover distribution). On average therefore, the proposed development may lead to one SPA/Ramsar/SSSI territory, or, as a worst case, two in some years, being displaced.

- 9.196 Given NatureScot's recent findings of declines in breeding densities of golden plover in the SPA (Ward 2024), it is concluded there would be available habitat to which the two displaced pairs could re-locate. However, there is clearly some factor or combinations of factors leading to the reduction of the SPA's golden plover population that could prejudice the territory success of these re-located birds.
- 9.197 The potential displacement of two golden plover territories is therefore assessed as a **minor** magnitude of change and **not significant**.

Collision risk to golden plover during operation

- 9.198 As reported in Technical Appendix 9.2, 10 flights of one or two locally breeding birds were recorded in summer 2023 and 2024 during the breeding season flight activity surveys. Of these, only one short duration flight of 45 seconds was recorded at rotor swept height and therefore at potential collision risk (Figure 9.6b).
- 9.199 With only one 'at risk' golden plover flight recorded over two years' breeding season flight activity surveys; the proposed development would pose very limited risk of collision. Therefore, the effect on breeding golden plover from turbine collisions would be of **negligible** magnitude **not significant**.

Decommissioning effects on golden plover

Disturbance/displacement effects on golden plover during decommissioning

- 9.200 It is predicted that the effects of disturbance on breeding golden plover shall be less than described above for construction for two reasons. Firstly, it is possible that over the lifetime of the wind farm, one to two breeding golden plover would have been displaced from close proximity to the turbine infrastructure (see above). Secondly, given the progression of climate change, and the trends in golden plover populations revealed by Ward (2024), the number of golden plover territories in the area may have declined, regardless of the proposed wind farm.
- 9.201 The potential disturbance effects on breeding golden plover during decommissioning are therefore assessed as **negligible** magnitude and **not significant**.

Significance of potential effects on golden plover

- 9.202 From desk studies and baseline data, the proposed development and the 500m survey buffer for this species are considered to be internationally important for golden plover.

- 9.203 Given the magnitude of effects predicted to result from the construction, operation and decommissioning of the proposed development, there are **no significant effects** predicted from the proposed development, as summarised in Table 9.19.

Table 9.19: Summary of assessment of potential effects on golden plover

Phase	Effect	Potential magnitude of change	Significance
Construction	Habitat loss/modification	Negligible. No direct or indirect loss of suitable habitat	Negligible: Not significant
Construction	Disturbance/displacement	Negligible. Two putative territory centres within 500m potential disturbance distance but construction activity would be screened by the retained conifer plantation.	Negligible: Not significant
Operation	Disturbance/displacement	Minor. Potential displacement of one to two breeding territories of international significance	Minor: Not significant
Operation	Collision	Negligible. No at-risk flights.	Negligible: Not significant
Decommissioning	Disturbance/displacement	Negligible. Construction activity within 500m of putative territory centres screened by plantation.	Negligible: Not significant

Potential Effects on Breeding Greenshank

Status of greenshank

- 9.204 Greenshank are Amber-listed in BoCC5. It is on Schedule 1 but is not an Annex 1 species.
- 9.205 Only one national survey has been completed, in 1995, which estimated there were 1,080 pairs in UK, all in northwest Scotland (Hancock *et al.* 1997). More recent Atlas work suggests there has been little change in range, although with minor losses especially in Badenoch and Strathspey (Balmer *et al.* 2013). Otherwise, the breeding trend appears stable. The Scottish breeding population has most recently been estimated as 1,297 pairs (CLs =851-1,792) see Wilson *et al.* (2015), although this may be an under-estimate (see comments in Humphreys *et al.* 2015 and Wilson *et al.* 2015). The uncertainty over population arises because greenshank was included in a near-comprehensive survey of NHZ5 in 2009, which estimated that the breeding population was 1,052 (95% C.I. 389 – 1,752) pairs (Bellamy and Eaton 2009, Paul Bellamy pers. comm.). While the 95% confidence interval of this estimate encompasses the estimate of 421 for this area, the estimate itself is more than twice as large. However, without more detailed study, it is not possible to say whether this is because the 1995 survey underestimated the national greenshank population, whether the assessment of Bellamy and Eaton (2009) is an overestimate, or whether there has been an increase between the two periods that was not captured in the Atlas data. If the newer estimate is accurate, it is possible that other NHZs also hold more pairs than estimated here, and the total of 1,297 pairs may be a significant underestimate of the national breeding population.

- 9.206 The population and distribution trends for greenshank within the Caithness and Sutherland Peatlands SPA/Ramsar Site have recently been assessed by NatureScot, from monitoring in 2004, 2009, 2015 and 2023 (Ward 2024). Greenshank breeding territory density increased consistently between 2004 and 2023, with 51% more occupied territories in 2023 than in 2004.
- 9.207 There were no greenshank territories at all within the development footprint in either survey year. Within the surrounding survey buffer, there were no territories present in 2024 but there were three putative territories in 2023 on open moorland within the Caithness and Sutherland Peatlands SPA/Ramsar Site and the Strath Duchally SSSI (Figures 9.4 and 9.5). None of these putative territories were closer than 500m of the proposed development.
- 9.208 As noted in paragraphs 9.53 and 9.75, the 2024 MBBS survey dates did not include the periods of peak greenshank detectability, so it is possible the absence of territories in 2024 was a facet of survey timing. Therefore, to account for this, in the assessment it has been assumed that there were also three putative territories as in 2023.
- 9.209 As greenshank are a SPA qualifying species, the species is judged to be of international importance for this assessment.

Construction effects on greenshank

Habitat Loss/change effects during construction on greenshank

- 9.210 Although greenshank are more tolerant and adapted to inhabit open forest or thicket (Nethersole-Thompson and Nethersole-Thompson 1979, Wilson *et al.* 2014), the proposed development's footprint occupies dense conifer plantation which is not suitable for breeding or foraging greenshank. As is evident from the two years' breeding bird surveys results, none of the residual modified bog or heathland within the conifer plantation rides were used by breeding greenshank either.
- 9.211 There would be no direct loss of breeding greenshank habitat during construction. The magnitude of habitat effects would therefore be **negligible** and **not significant**.

Disturbance/displacement effects during construction on greenshank

- 9.212 The review of disturbance distance evidence by Goodship and Furness (2022) recommended a disturbance buffer of 300m to 500m for breeding greenshank to prevent disturbance from pedestrians. All the greenshank territories at the proposed development were beyond 500m from construction activities (Figures 9.4 and 9.5). As construction activity (notably the movement of people, which is the key cause of disturbance risk with birds, rather than machinery movements) would be screened by the conifer plantations, it is concluded that displacement of greenshank at these distances is highly unlikely (even if construction of those turbines took place in the April to July breeding season).
- 9.213 The potential disturbance effects on breeding greenshank during construction are assessed as of **negligible** magnitude and **not significant**.

Operational effects on greenshank

Disturbance/displacement effects during operation on greenshank

- 9.214 There have been several wind farms in this part of Scotland where post-construction monitoring has followed pre-consent baseline surveys for a number of years. Although not peer reviewed or published, results reviewed by Zisman (2015) from Rosehall and Achany Wind Farms were scrutinised at public inquiry and accepted as demonstrating the persistence of territories during at least the first five years of wind farm operation. Subsequently, further evidence has become available from on-going monitoring at Strathly North Wind Farm and Causeymire Wind Farm (Zisman 2019, Sustainable Solutions Group 2019). In all cases, there was no evidence that breeding greenshank had been displaced by these operational wind farms.
- 9.215 NatureScot accepted that the potential displacement distance from operational wind farms was 300m, but in many cases, putative territory centres, nesting birds, foraging adults or young with chicks have been found in suitable habitat closer to turbines and other wind farm infrastructure.
- 9.216 Therefore, no displacement of greenshank is predicted from the proposed development so the magnitude of change would be **negligible** and **not significant**.

Collision risk to greenshank during operation

- 9.217 No 'at risk' greenshank flights were recorded during the two years' of breeding flight activity surveys, with the small number of flights recording being west of the proposed development. Therefore, the magnitude of predicted collision is **negligible** for breeding greenshank and **not significant**.

Decommissioning effects on greenshank

Disturbance/displacement effects on greenshank during decommissioning

- 9.218 It is predicted that the effects of disturbance on breeding greenshank would be similar to those during construction as although the conifer plantation will have been harvested by the time of decommissioning, putative greenshank territories are still likely to be centred around the same areas as present, i.e. in areas of wetter and more varied habitat.
- 9.219 The potential disturbance effects on breeding greenshank during decommissioning are therefore predicted to be of **negligible** magnitude and **not significant**.

Significance of potential effects on greenshank

- 9.220 From desk studies and baseline data, the proposed development and the 500m survey buffer for this species are considered to be internationally important for greenshank.

- 9.221 Given the magnitude of effects predicted to result from the construction, operation and decommissioning of the proposed development, there are **no significant effects** predicted from the proposed development, as summarised in Table 9.20.

Table 9.20: Summary of assessment of potential effects on greenshank

Phase	Effect	Potential magnitude of change	Significance
Construction	Habitat loss/modification	Negligible. No direct or indirect loss of suitable habitat.	Negligible: Not significant
Construction	Disturbance/displacement	Negligible. There were no putative territory centres within 300m of construction activity.	Negligible: Not significant
Operation	Disturbance/displacement	Negligible. There were no putative territory centres within 300m of the proposed development.	Negligible: Not significant
Operation	Collision	Negligible. No at-risk flights.	Negligible: Not significant
Decommissioning	Disturbance/displacement	Negligible. There is no construction activity within 300m of putative territory centres.	Negligible: Not significant

Potential Effects on Breeding Merlin

Status of Merlin

- 9.222 Merlin are Red-listed in BoCC5 and on Schedule 1 and Annex 1.
- 9.223 As explained by Wilson *et al.* (2015), there is no firm breeding population estimate for merlin in Scotland, but the estimate derived from more intensively studied areas and extrapolated for Scotland as a whole is 433 breeding pairs (less than the 733 from the previous national survey - see Wilson *et al.* (2015) for details). The estimated number of breeding pairs in NHZ5 is 71. The Caithness and Sutherland Peatlands SPA/Ramsar estimated number of pairs, based on 1993 and 1994 data, was 54 pairs.
- 9.224 From the two years' breeding raptor surveys and five years' data from the HRSG and RSPB, all out to 2km from the proposed development, there was one merlin territory recorded, approximately 0.35km north of the proposed development early in the 2023 breeding season (see Confidential Annex, Figure 9.7). Following a food pass recorded on 18th April 2023, the only other breeding season sighting in 2023 was during a VP survey of a single bird in flight to the west of the site. There were no merlin recorded in 2024.
- 9.225 As merlin are a SPA qualifying species, and it is within potential connectivity distance of the SPA, it has been assigned international nature conservation importance for this assessment (SNH 2016a).

Construction effects on merlin

Habitat Loss/change effects during construction on merlin

- 9.226 Although merlin do nest in the edges of conifer plantations, at the proposed development and its 2km survey buffer, the breeding season records of the birds have been on open moorland, the species' more normal breeding habitat.
- 9.227 From the two years' breeding raptor surveys and five years' data search from the Highland Raptor Study Group, there is no evidence of merlin using the conifer plantation for nesting, roosting or foraging.
- 9.228 The proposed development's footprint occupies the central portion of the conifer which is also not suitable because merlin nests in this habitat are on the outer edge of plantations, or within a few metres of the plantation edge, facing onto open habitat. Whilst the proposed development would result in some plantation clearance, the overall habitat characteristics of the plantation edge would therefore remain the same, until such time as the plantation reached economic maturity and was felled. Once re-planted, as detailed in Chapter 14: Forestry, post-construction monitoring evidence from wind farm sites as Strathy North shows that it remains relatively unused by SPA breeding species, and once re-stocked, it will not provide suitable nesting habitat until the conifers are relatively mature, which would be beyond the 35-year operational life of the proposed development.
- 9.229 There would be no direct loss of breeding merlin moorland habitat during construction (and no reduction in plantation edge). The magnitude of habitat effects would therefore be **negligible** and **not significant**.

Disturbance/displacement effects during construction on merlin

- 9.230 The review of disturbance distance evidence by Goodship and Furness (2022) recommended a disturbance buffer of 300m to 500m for breeding merlin to prevent disturbance from pedestrians.
- 9.231 Although the one merlin territory recorded within the proposed development's 2km survey buffer was within this potential disturbance distance (Confidential Figure 9.7), this would be screened from construction activity (notably the movement of people, which is the key cause of disturbance risk with birds, rather than machinery movements) by the retention of the plantation edge. It is therefore concluded that displacement of merlin is highly unlikely (even if construction of those turbines took place in the April to July breeding season).
- 9.232 The further safeguard against the risk of construction disturbance is the embedded mitigation described in paragraphs 9.77 to 9.83. Given its Annex 1 status, disturbance to breeding merlin must be prevented by law, and this will be achieved through pre-commencement breeding raptor surveys out to 1km, the resulting Breeding Bird Protection Plan, and the full-time deployment of an experienced ECoW.

- 9.233 The potential disturbance effects on breeding merlin during construction are therefore assessed as of **negligible** magnitude and **not significant**.

Operational effects on merlin

Disturbance/displacement effects during operation on merlin

- 9.234 Specific studies on disturbance to merlin from construction activity are lacking but following a review of evidence on disturbance to breeding merlin from pedestrians, the buffer recommended was up to 500m (Goodship and Furness 2022). Applying this disturbance buffer for the assessment of effects of construction is considered precautionary, given birds are more sensitive to people out in the open than to vehicles, and that most construction activity will be screened by the remaining *in situ* conifer plantation (see Chapter 14: Other Issues (including Forestry)).
- 9.235 The baseline surveys for the proposed development identified one possible merlin territories in 2023, approximately 350m from the development footprint (Confidential Figure 9.7) and none in 2024.
- 9.236 Therefore, given the limited merlin activity and the forest screening, no displacement of merlin is predicted from the proposed development so the magnitude of change would be **negligible** and **not significant**.

Collision risk to merlin during operation

- 9.237 No 'at risk' merlin flights were recorded during the two years' of breeding flight activity surveys, with the only flight recorded being west of the proposed development. Therefore, the magnitude of predicted collision is **negligible** for breeding merlin and **not significant**.

Decommissioning effects on merlin

Disturbance/displacement effects on merlin during decommissioning

- 9.238 It is predicted that the effects of disturbance on breeding merlin would be similar to those during construction as although the conifer plantation will have been harvested by the time of decommissioning, merlin territories may or may not be as fully screened if re-planting has not reached the closed thicket stage at the time of decommissioning (approximately 2065). Embedded mitigation that would be applied during decommissioning is described in paragraph 9.85.
- 9.239 The potential disturbance effects on breeding merlin during decommissioning are therefore predicted to be of **negligible** magnitude and **not significant**.

Significance of potential effects on merlin

- 9.240 From desk studies and baseline data, the proposed development and the 2km survey buffer for this species are considered to be internationally important for merlin.

- 9.241 Given the magnitude of effects predicted to result from the construction, operation and decommissioning of the proposed development, there are **no significant effects** predicted from the proposed development, as summarised in Table 9.21.

Table 9.21: Summary of assessment of potential effects on merlin

Phase	Effect	Potential magnitude of change	Significance
Construction	Habitat loss/modification	Negligible. No direct or indirect loss of suitable habitat.	Negligible: Not significant
Construction	Disturbance/displacement	Negligible. The only territory present was within the 300m-500m disturbance range for this species, but construction activity would be screened by the plantation, and disturbance would be prevented through embedded mitigation (pre-construction survey, Breeding Bird Protection Plan and ECoW).	Negligible: Not significant
Operation	Disturbance/displacement	Negligible. The only territory present was within the 300m-500m disturbance range for this species. However, the risk of operational disturbance is low, given it would be short-term, infrequent and screened by the conifer plantation (at least prior to felling).	Negligible: Not significant
Operation	Collision	Negligible. No at-risk flights.	Negligible: Not significant
Decommissioning	Disturbance/displacement	Negligible. Disturbance would be prevented by embedded mitigation (pre-construction survey, Breeding Bird Protection Plan and ECoW).	Negligible: Not significant

- 9.242 Paragraphs 9.144 to here and Tables 9.15 to 9.21 assess the potential construction, operational and decommissioning effects of the proposed development on birds ascribed to be of international nature conservation importance. This has been, in particular, to assess potential effects on the qualifying species of the Caithness and Sutherland Peatlands SPA/Ramsar site, given the proposed development is adjacent to these internationally important designated sites. On the basis of desk study and survey results, the species this involved were dunlin, golden plover and greenshank. As these species are also the features of interest of the Strath Duchally SSSI, the assessment has also covered the predicted effects on this designated site as well (which would otherwise have been categorised as of national conservation importance).
- 9.243 Golden eagle were also included as having international nature conservation importance, although this was done on a precautionary basis, as the nearest nest site was approximately 7km to the north and is not associated with the Caithness and Sutherland Peatlands SPA. Merlin was also included, as a possible territory in 2023 was in close proximity to the SPA/Ramsar Site boundary.
- 9.244 The assessment of the internationally important species identified from baseline surveys and desk studies has concluded the proposed development will have no more than

negligible or minor effects on any of these species, and therefore not cause any significant effects on these species in EIA terms.

Species Considered of Regional Conservation Importance

- 9.245 Two species were categorised as being of regional nature conservation importance from the desk study and baseline surveys completed for the proposed development. These are white-tailed eagle and black grouse. The justification for this categorisation as regionally important is summarised in Table 9.22.

Table 9.22: Bird species considered of international importance in the assessment

Ornithological Feature (IoF)	Species conservation value ¹	Site Level of Importance for IoF	Justification
White-tailed eagle	▪ Annex I ▪ Schedule I ▪ BoCC5 = Amber-list	Regional	No breeding pairs within 6km from surveys and desk study. No roosting birds observed within the proposed development or within 2km or 6km. 6 flights in 2023 (5 single birds, 1 of 2 birds). 4 flights in 2024 (2 flights of single birds, 1 flight by a pair, and 1 flight of 3 birds (2 adults and an immature bird) during VP surveys (from Oct. 2022 to August 2024). Therefore: - i. No connectivity with designated population ii. <1% of estimated UK/GB breeding population of 1,100 pairs iii. <1% of regional population (NHZ 5) of 1 breeding pairs Nonetheless, categorised as of regional nature conservation importance as a precaution.
Black grouse	▪ Annex I ▪ SBL ▪ BoCC5 = Red-list	Regional	One displaying male in 2023 only. i. <1% of estimated UK/GB breeding population of 4,850 males <1% of regional population (NHZ5 Peatlands of Caithness and Sutherland) of 30 lekking males (Wilson <i>et al.</i> 2015)

Potential Effects on White-tailed Eagle

Status of white-tailed eagle

- 9.246 White-tailed eagles are on Schedule 1, 1A and A1 and Annex 1, and are Amber-listed in BoCC5.
- 9.247 Following releases in eastern Scotland between 2007 and 2012, the white-tailed eagle population has grown strongly and was estimated at 150 breeding pairs in Scotland (Eaton *et al.* (2023)). Population models suggest it will increase considerably in the coming years, as well as spread over much of Scotland. Density-independent predictive models

suggest the population could continue to grow to over 200 pairs by 2025 (Sansom *et al.*, 2016b).

- 9.248 As well as breeding adults, the population includes a large number of “floating” immature and sub-adult birds, which can roam widely in areas away from the core breeding range (Whitfield *et al.* 2009a, 2009b).
- 9.249 From the 2024 HRSG Report, in 2024, of the 90 known territories in Highland Region, 79 were monitored. Of the 60 pairs that were known to have laid, 45 pairs were known to have hatched and at least 55 young fledged. Of the Highland Region population, 13 pairs nested in Sutherland and 1 pair in Caithness, raising a minimum of eight chicks.
- 9.250 From the two years' breeding raptor surveys and five years' data from the HRSG and RSPB, all out to 6km from the proposed development, there were no nesting white-tailed eagle recorded, however.

Construction effects on white-tailed eagle

Habitat Loss/change effects during construction on white-tailed eagle

- 9.251 In light of the baseline survey results, it is evident from the limited flight frequency of flights over the two survey years, that the Site is of negligible habitat value as foraging habitat.
- 9.252 Whilst white-tailed eagles tend to nest on the outer fringes of conifer plantations, particularly where the plantations are dense and of limited species or structural diversity, it is considered relatively unlikely that they would use the forest edge after the proposed development was in place, so it is considered the plantation would become unsuitable as nesting habitat. However, given the extent of potential nesting habitat in plantation and other forest cover in NHZ5 and beyond, and the lack of breeding activity in the survey buffer and site, this loss of nesting habitat is very small scale.
- 9.253 The magnitude of effects from loss of foraging and nesting habitat would therefore be **negligible** and **not significant**.

Disturbance/displacement effects during construction on white-tailed eagle

- 9.254 The review of disturbance distance evidence by Goodship and Furness (2022) recommended a disturbance buffer of 500m to 1,000m for white-tailed eagle to prevent disturbance from pedestrians.
- 9.255 There were however, no nesting or roosting sites recorded over the survey period and therefore the potential disturbance effects on white-tailed eagle during construction are assessed as of **negligible** magnitude and **not significant**.

Operational effects on white-tailed eagle

Disturbance/displacement effects during operation on white-tailed eagle

- 9.256 The displacement effect of white-tailed eagles around wind farms has not been subjected to the same level of examination as for golden eagle (primarily because the bird's breeding range has been much more restricted). Humphreys *et al.* (2015) did, however, review the evidence that was available as of 2015. They reported Paul Howarth and co-workers' monitoring of white-tailed eagle activity before, during and after construction at Edinbane and Ben Aketil Wind Farms (on the Isle of Skye), noting it found high inter-annual variation of flight activity over the nine years of observations, with no evidence for avoidance of the wind farms by white-tailed eagles at these sites. Having considered further evidence from Norway, Finland and Germany in particular, Humphreys *et al.* (2015) concluded the combined research suggested white-tailed eagles abandon or breed less successfully at nesting sites that are close to wind turbine locations (breeding displacement), but that they do not consistently show strong avoidance/displacement in terms of flight behaviour.
- 9.257 In the absence of any breeding activity therefore, no displacement of white-tailed eagles is predicted from the proposed development so the magnitude of change would be **negligible** and **not significant**.

Collision risk to white-tailed eagle during operation

- 9.258 Whilst instances of turbine collisions in the UK are very rare to date, deaths have occurred at a number of European wind farms, most notably at Smøla in Norway. This heightened the level of concern over collision risk, but no other wind farms have displayed the same level of collision. This is because Smøla Wind Farm is a special case in many ways, being on a low-lying archipelago amidst rich white-tailed eagle foraging habitat, and with a high density of breeding ground nesting pairs within and around the Wind Farm, and non-breeding birds also in the vicinity. It therefore has no ecological or landscape characteristics in common with the proposed development or its surroundings.
- 9.259 The CRM undertaken for the proposed development is detailed in Technical Appendix 9.2, and as summarised in paragraphs 9.137 and 9.139 above, the CRM gives a predicted collision rate of 0.31 birds/year, equivalent to one white-tailed eagle every 3.2 years. Applying the same treatment of flight variation and uncertainty as with golden eagle, the CRM, the predicted collision rate for white-tailed eagle was 0.00 - 0.69 birds/year, equivalent to no collisions to a maximum of one white-tailed eagle every 1.5 years, or approximately 23 over the lifetime of the wind farm. Under the 40% operational time scenario, this equates to a range of 0 – 0.32 birds per year.
- 9.260 There are, however, a number of important numeric and biological considerations that need to be taken into account when assessing the validity of this modelling. Notably, the number of flights recorded during all surveys was very low (just 10 flights over 23 months' of flight monitoring), and 'at risk flights are even more infrequent, with just five flights (see Technical Appendix 9.2 for details). CRM outputs are therefore susceptible to relatively

large margins of error when the sample size is so small. Furthermore, white-tailed eagles are large and relatively slow-flying birds that often undertake prolonged circling flights. CRM outputs are therefore prone to be distorted by the particular characteristics of the 'at risk' flights that did occur in the small sample size, with the CRM output susceptible to being overly influenced by chance characteristics of particular flights (given these flights that may prove atypical). In addition, the choice of 95% avoidance rate has a particularly large impact on the predicted collision rate. The experience at Smøla has contributed to NatureScot adopting a highly precautionary 95% avoidance rate to apply for this species for collision risk modelling in Scotland. The circumstances of the birds recorded at the proposed development are significantly different from Smøla however, which is likely to mean that a 95% avoidance rate is highly over precautionary, and not realistic. Unlike the situation at Smøla, the white-tailed eagles recorded at the proposed development are not constrained in their flight movements by having to return to nearby nest sites located in close proximity to the wind farm. As already noted, no breeding activity has been recorded within a minimum of 6km from the proposed development.

- 9.261 For all these reasons therefore, the CRM findings from such limited flight activity are unlikely to be statistically robust or reliable as an indicator of the actual likelihood of collision. In reality, the collision rate for white-tailed eagle from the proposed development is likely to be at the lower end of the range predicted.
- 9.262 In terms of assessing the population significance of collision mortality, the NHZ5 population is too small a scale for white-tailed eagle since adults and subadults range over very large distances. The origin of the birds recorded around the proposed development is likely to encompass at least Scottish population, given by Eaton *et al.* (2023) as 150 pairs as of 2021, and by Challis *et al.* (2023) as 145 occupied home ranges in 2022 (140 occupied by pairs). The number of white-tailed eagles in Scotland therefore currently consists at least of these 280 adults (from the 140 pairs), plus five single territory occupants, all non-territorial adults and all sub-adult birds in Scotland. A conservative estimate would therefore be a total Scottish population of all white-tailed eagles of approximately 320 individuals.
- 9.263 An annual predicted collision rate of 0.00 - 0.69 birds/year equates to 0.0% to 0.2% a year of the Scottish population. Using the 0.69 rate, this would equate to 24.15 birds over the lifetime of the proposed development, or 7.5% of the Scottish white-tailed eagle population. However, the assessment of effects is not only based on quantitative model outputs alone, particularly where the limited number of flights makes the modelling process susceptible to large margins of error (extrapolating from a small sample size). Consideration of the key geographic and ecological (qualitative) factors is essential to derive as realistic prediction of effects as possible, and this requires assessment of the individuals present, their behaviour (including ranging distance), age, breeding activity, habitat use, quality and functionality, and the species wider population dynamics, including trends over the lifetime of the proposed development. Having taken these factors into account, and including the projected rate of population growth with and without additional mortality (modelled in Sansom *et al.* 2016b), it is considered that the effect of collision would not result in significant effects for the regional breeding population (the regional population being taken as the Scotland population, given the extensive ranging distribution of this species). The magnitude of population change from predicted collision is therefore judged to be **negligible** for white-tailed eagle and **not significant**.

Decommissioning effects on white-tailed eagle

Disturbance/displacement effects on white-tailed eagle during decommissioning

- 9.264 It is predicted that the effects of disturbance on breeding white-tailed eagle on Site would be even less than those during construction, as the conifer plantation will have been harvested by the time of decommissioning so there would be no risk of white-tailed eagle nesting or roosting there.
- 9.265 Depending on any retentions in the Fiag plantation to the northeast or the plantation to the southwest, it is possible that there could be white-tailed eagle nesting or roosting in these areas, however. This would be determined through pre-commencement breeding raptor survey, as part of the embedded mitigation, and any risk would be managed accordingly through deployment of an ECoW.
- 9.266 The potential disturbance effects on breeding white-tailed eagle during decommissioning are therefore predicted to be of **negligible** magnitude and **not significant**.

Significance of potential effects on white-tailed eagle

- 9.267 From desk studies and baseline data, the proposed development and the 6km survey buffer for this species are considered to be regionally important for white-tailed eagle, taking a precautionary approach.
- 9.268 Given the magnitude of effects predicted to result from the construction, operation and decommissioning of the proposed development, there are **no significant effects** predicted from the proposed development, as summarised in Table 9.23.

Table 9.23: Summary of assessment of potential effects on white-tailed eagle

Phase	Effect	Potential magnitude of change	Significance
Construction	Habitat loss/modification	Negligible. The Site is not used for nesting, and there is very infrequent flights over or in proximity to the proposed development, indicating negligible value for foraging.	Negligible: Not significant
Construction	Disturbance/displacement	Negligible. No territories or roosts within potential 500-1,000m disturbance distance.	Negligible: Not significant
Operation	Disturbance/displacement	Negligible. No territories or roosts within potential 500-1,000m disturbance distance.	Negligible: Not significant
Operation	Collision	Negligible. Only 10 flights recorded from Oct. 2022 to August 2024, with only half of these 'at risk' of collision. Such a low level of flight activity indicates a very low likelihood of collision.	Negligible: Not significant

Phase	Effect	Potential magnitude of change	Significance
Decommissioning	Disturbance/ displacement	Negligible. No likelihood of territories or roosts within potential 500-1,000m disturbance distance.	Negligible: Not significant

Potential Effects on Black Grouse

Status of black grouse

- 9.269 Black grouse is Red-listed in BoCC5. The Red-list status is primarily due to severe declines in the breeding population (>50%). It is not a Schedule 1 or Annex 1 species.
- 9.270 The 2005 estimate of the Scottish breeding population is 3,344 pairs (CI: 2,580–4,171) (Sim *et al.* 2008) and the estimated number of lekking males in NHZ5 is 30 (Wilson *et al.* 2015). Forrester *et al.* (2012) estimated the Scottish population to be between 3,550-5,750 lekking males in the early 2000s, but there have been significant declines in population since then.
- 9.271 From the desk study and two years' breeding bird surveys, there was one single bird lekking approximately 900m east of the development footprint. This was in 2023, and despite repeat surveys in 2024, no other observations of black grouse or signs of their presence were recorded during any further survey after April 2023. Given the lack of further records, and that only a single bird was seen throughout the whole survey period, plus the fact that the RSPB data search request out to 2km for the previous five years did not highlight any other black records strongly suggests that this was either a transient bird or the species was locally extinct after 2023.

Construction effects on black grouse

Habitat Loss/change effects during construction on black grouse

- 9.272 The development footprint occupies conifer plantation and is not suitable for breeding or foraging black grouse. Therefore, the proposed development will not lead to any loss of habitat on which lekking, nesting or chick-rearing black grouse depend.
- 9.273 There would be no direct loss of breeding black grouse habitat during construction therefore so the magnitude of habitat effects would be **negligible** and **not significant**.

Disturbance/displacement effects during construction on black grouse

- 9.274 Specific studies on disturbance to black-grouse from construction activity are lacking but following a review of evidence on disturbance to the species from pedestrians, the buffer recommended was 500-750m for lekking males and 100-150m in the non-breeding season (Goodship and Furness 2022).
- 9.275 The baseline surveys for the proposed development identified one single bird lekking approximately 900m east of the development footprint (Confidential Annex Figure 9.7). No black grouse were observed during non-breeding seasons surveyed.

- 9.276 The potential disturbance effects on lekking and non-breeding black grouse during construction are therefore predicted to be of **negligible** magnitude and therefore **not significant**.

Operational effects on black grouse

Disturbance/displacement effects during operation on black grouse

- 9.277 Analysis of displacement of leks at Scottish wind farms has been carried out by Zwart *et al.* (2015) using pre- and post-construction data from seven wind farm sites in a Before-After (BA) study. For leks at comparable distance from wind farm infrastructure to the 900m at the proposed development there was no evidence of displacement.
- 9.278 Therefore, no black grouse leks are predicted to be displaced, and the magnitude of change from the current baseline is **negligible** and the predicted effect on this species is **not significant**.

Collision risk to black grouse during operation

- 9.279 As there were no black grouse flights recorded, there is no collision risk. Therefore, the predicted magnitude of change for black grouse from turbine collisions is **negligible** and **not significant**.

Decommissioning effects on black grouse

Disturbance/displacement effects on black grouse during decommissioning

- 9.280 It is predicted that the effects of disturbance on black grouse would be no more than during construction, and therefore **negligible and not significant**.

Significance of potential effects on black grouse

- 9.281 From desk studies and baseline data, the proposed development and the 1.5km survey buffer for this species are considered to be regionally important for black grouse.
- 9.282 Given the magnitude of effects predicted to result from the construction, operation and decommissioning of the proposed development, there are **no significant effects** predicted from the proposed development, as summarised in Table 9.23.

Table 9.24: Summary of assessment of potential effects on black grouse

Phase	Effect	Potential magnitude of change	Significance
Construction	Habitat loss/modification	Negligible. No suitable habitat lost or modified.	Negligible: Not significant
Construction	Disturbance/displacement	Negligible. Single lek well beyond potential disturbance distance.	Negligible: Not significant

Phase	Effect	Potential magnitude of change	Significance
Operation	Disturbance/ displacement	Negligible. Single territory well beyond potential disturbance distance.	Negligible: Not significant
Operation	Collision	Negligible. No at-risk flights.	Negligible: Not significant
Decommissioning	Disturbance/ displacement	None. Single territory well beyond potential disturbance distance.	Negligible: Not significant

9.283 Paragraphs 9.257 to 9.294 and Tables 9.22 to 9.24 have assessed the potential construction, operational and decommissioning effects of the proposed development on birds of regional nature conservation importance. On the basis of desk study and survey results, these species were white-tailed eagle and black grouse.

9.284 The assessment of the regionally important species identified from baseline surveys and desk studies has concluded the proposed development will have no more than negligible effects on any of these species, and therefore not cause any significant effects on these species in EIA terms.

Species Considered of Local Conservation Importance

9.285 The assessment will now briefly cover the species categorised as being of local nature conservation importance, based on the criteria given in Table 9.22. From the desk study and baseline surveys completed for the proposed development, these species are whooper swan, pink-footed geese, mallard and snipe.

9.286 As these are only of local importance, the assessment of all potential effects on these species from the proposed development is not given at the same level of detail, for the sake of brevity and in line with EIA guidance (CIEEM 2018). The assessment of the proposed development's effects on these species is concluded to be of **negligible** magnitude and **not significant**.

Table 9.25: Importance Ornithological Features of local importance

Ornithological Feature (IoF)	Species conservation value ¹	Justification for classification of Site population as local importance
Whooper swan	▪ Annex I ▪ (Schedule I = n/a) ▪ BoCC5 = Amber-list	One flight (19 birds) during VP survey (Non-breeding, March 2023) and one flight (3 birds) during VP survey (Non-breeding, February 2024). i. No connectivity with designated population ii. <1% of estimated UK/GB wintering population of 16,100 individuals iii. <1% of regional population (NHZ5 Peatlands of Caithness and Sutherland) of WEBS 5-year mean peak count of 95 individuals
Pink-footed goose	▪ BoCC5 = Amber-list	Seven flights, mostly in September 2023, but only two crossed the turbine envelope at RSH,

Ornithological Feature (IoF)	Species conservation value ¹	Justification for classification of Site population as local importance
		comprising skeins of 30 and 32 birds. All passage/non-breeding birds over-flying VP viewsheds on migration. None recorded 2024; i. No connectivity with designated population ii. <1% of estimated UK/GB wintering population of 510,000 individuals³³ iii. <1% of regional population (NHZ5 Peatlands of Caithness and Sutherland) of WEBS 5-year mean peak of 579 individuals
Mallard	▪ BoCC5 = Amber-list	One non-breeding and one breeding season flight of 2 birds in 2023 during VP surveys i. <1% of estimated UK/GB breeding population of 59-140,000 pairs ii. No published regional population data but considered <1%
Snipe	▪ BoCC5 = Amber-list	One territory in 2023 and none in 2024. i. The territory centre is beyond the disturbance distance for this species from the development footprint. No flights were recorded in the VP viewsheds. ii. <1% of estimated UK/GB breeding population of 64,500 pairs iii. <1% of regional population (NHZ5 Peatlands of Caithness and Sutherland) of 2,673 pairs

Cumulative Effect Assessment

- 9.287 Up to this stage, the assessment of predicted effects on birds has been from the proposed development alone. The following section assesses the cumulative effects of wind farms and other developments which may impact the same bird populations.
- 9.288 As described above in paragraphs 9.72 to 9.73, the approach to assessing cumulative impacts follows SNH guidance (2024), with all operational, consented and submitted developments being considered. Developments which have been refused planning permission or have remained in the application stage for over five years are not included. Wind energy developments of fewer than three turbines (except extensions to existing wind farms) are not included, as such developments rarely have comparable or useful data for cumulative impact assessment (CIA).
- 9.289 As well as wind energy developments, the CIA considers the additive effects of overhead power lines and other land management developments such as forestry operations, where these projects are in operation or approved within the vicinity of the proposed site.

- 9.290 NatureScot guidance states that assessments should focus on the most significant cumulative impacts and conclude with a clear assessment of those which are likely to influence decision making.
- 9.291 Therefore, the CIA was carried out to determine what the combined effects of relevant developments were on the Caithness and Sutherland Peatlands SPA/Ramsar Site and the NHZ5 population. In Habitats Directive and Regulations terminology, the term 'cumulative' is replaced by 'in combination', and the only notable difference in approach being that the latter needs to cover relevant plans as well as projects.
- 9.292 In light of the assessment of the projects' predicted effects from construction, operation and decommissioning, the CIA is needed for three species, namely:-
- Golden plover, of the species of international nature conservation importance, due to the risk of cumulative/in combination displacement effects on the Caithness and Sutherland Peatlands SPA/Ramsar site;
 - White-tailed eagle, of the species of regional nature conservation importance, due to the risk of cumulative collision risk; and
 - Golden eagle, given its precautionary categorisation as a species of international nature conservation importance, but due to the risk of cumulative collision risk on the regional (NHZ5) population (since the territory potentially effected is not connected to the Caithness and Sutherland Peatlands SPA/Ramsar site).

Cumulative effects on the Caithness and Sutherlands Peatlands SPA/Ramsar Site

Golden plover

- 9.293 The assessment of effects on golden plover from the proposed development concluded there were no significant effects predicted, either from construction, operation or decommissioning. Whilst construction and decommissioning risks from displacement were negligible (and temporary and reversible), the risk of displacement of one to two golden plover territories due to operational displacement was however, assessed as minor. As a precaution therefore, and given that there is some conflicting evidence about the distance over which golden plover may be displaced, golden plover have been included for CIA/in combination assessment.
- 9.294 They are a qualifying interest of the SPA as a breeding species, with the SPA holding an estimated 1,064 pairs (1993 and 1994 data), equivalent at the time to 5% of the GB population. The more recent analysis of long-term monitoring plots in the SPA/Ramsar site by Ward (2024) shows the golden plover population has declined, with her analysis concluding:-

'Golden plover were the only one (out of dunlin, greenshank and golden plover) that has been assessed as being in unfavourable condition since Caithness and Sutherland Peatlands SPA was classified. This was in 2009 when territory density was 33% lower than in the baseline year (2004). The golden plover population was also statistically significantly

lower in 2009 than in 2004. The golden plover population had recovered just enough by 2015 to bring in back into favourable condition (24% loss from 2004 compared with a 25% loss triggering unfavourable condition). This partial recovery was maintained in 2023 (21% loss compared to 2004). Golden plover territory density was statistically significantly lower in 2015 and 2023 than in 2004, but was within the range of acceptable variation for the golden plover feature to be assessed as being in favourable condition in NatureScot's SCM programme. Nevertheless, there has been a long-term decline in golden plover territory density in the survey plots since the 1993/94 survey, equivalent to an average loss of 1.3% per year or a 32.9% decline over the 30 years since 1993'.

Cumulative potential disturbance/displacement effects: golden plover

- 9.295 The assessment of effects on golden plover from the proposed development concluded that risks arose only during operation (rather than during construction or decommissioning), and that these potential effects were displacement of zero territories in 2023, two territories in 2024, or a mean of one territory over both years, assuming all territories within 500m of the nearest turbine were displaced.
- 9.296 NatureScot does not maintain a compilation of wind farms (or other developments) that predict displacement of waders from the Caithness and Sutherland Peatlands SPA. Therefore, a search of wind farms within 500m of the SPA boundary was undertaken using the Scottish Environment website¹², by applying the 'SPA (Scotland)' and 'Onshore Wind Farm Proposals' map layers. The results were cross-checked with NatureScot's collision rates Excel spreadsheet of wind farms around the SPA. This combined approach identified 32 wind farms within 500m of the Caithness and Sutherland Peatlands SPA/Ramsar Site. These are listed in Table 9.26.

Table 9.26: Summary of assessment of potential effects on golden plover

Wind Farm	Status	Number of SPA golden plover territories predicted to be displaced (after mitigation)	Number of SPA golden plover territories to be displaced (taking account of planning status or post construction monitoring))
Ackron	Withdrawn	-	-
Achany	Operational	8 (to 500m)	1
Achany Extension	Approved	2 to 3	2 to 3
Armada	Withdrawn	-	-
Bad a Cheo	Operational	0	0
Bettyhill	Operational	N/A	N/A
Bettyhill 2	Approved	1	1
Boulfruch	Approved	N/A	N/A
Broubster 2	Refused on Appeal ?	-	-

¹² <https://map.environment.gov.scot/sewebmap/>

Wind Farm	Status	Number of SPA golden plover territories predicted to be displaced (after mitigation)	Number of SPA golden plover territories to be displaced (taking account of planning status or post construction monitoring))
Brabster	Scoping (lapsed)	3	0
Causeymire	Operational	N/A	0
Creag Riabhach	Operational	0	0
Creag Riabhach Extension	Consented	0	0
Creag Riabhach Grid Connection	Application	N/A	N/A
Forsinain	Scoping	N/A	N/A
Golticlay	Operational	0	0
Gordonbush	Operational	0	0
Gordonbush Extension	Operational	0	0
Halsary	Operational	0	0
Hollandmey	Consented	1	1
Kirkton Energy Park	Appeal	3	3
Limekiln/Limekiln Variation/Extension	Operational	0	0
Melvich Wind Energy Hub	Application	4	4
Rosehall	Operational	N/A	N/A
Sallachy	Consented	N/A	N/A
Shinness	Application	4	4
Slickly	Refused	-	-
Stemster	Application	N/A	N/A
Strathy North	Operational	N/A	N/A
Strathy South	Construction	N/A	N/A
Strathy Wood	Consented	1	1
Stroupster/Hill of Stroupster	Operational	0	0
Tormsdale	Application	N/A	N/A
Watten	Application	0	0

9.297 Incorporating wind farm status and taking publicly available post-construction monitoring results into account (but also taking a precautionary view of mitigation effectiveness in the absence of post-construction monitoring results), the cumulative/in combination number of golden plover territories displaced from the Caithness and Sutherlands Peatlands SPA/Ramsar Site would be in the region of 18 pairs, at the most precautionary level, and assuming all territories within 500m of turbines were displaced and lost to the population.

- 9.298 It is evident however, that there is habitat available to accommodate golden plover displaced by wind farms, given the decreasing abundance evident in many parts of the SPA (Ward 2024). It is also the case that the extent of available habitat is increasing. RSPB is removing several conifer blocks to restore to blanket bog and heathland, and a number of wind farms' Habitat Management Plans are also enhancing habitats within the SPA, including through the removal of large blocks of conifer plantation (notably at Strathy South, Strathy North, Strathy Wood and Rosehall Wind Farms). Therefore, by removing the suppressing effects of these forest blocks on adjacent golden plover territory density and productivity, more habitat is becoming available with the Caithness and Sutherlands Peatlands SPA/Ramsar Site.
- 9.299 Therefore, although the golden plover population of the SPA is experiencing pressures, most likely from the effects of climate change on prey availability, the population has managed to just maintain favourable conservation status in recent years. Given the combination of conifer removal taking place within and around the SPA, it is judged that the cumulative displacement of up to a precautionary 18 golden plover territories out of the designated population of 1,064 pairs (equivalent to approximately 1.7%) would not have an adverse effect on its conservation objectives in relation to golden plover (as discussed further under the HRA Section of this Chapter). In EIA terms, the cumulative impact on the SPA/Ramsar site's golden plover populations is therefore predicted to be of **negligible** magnitude and **not significant**.

Cumulative effects on golden plover NHZ5 Population

- 9.300 Wilson *et al.* (2015) estimate the NHZ5 breeding golden plover population as 3,125 pairs. As reasoned above, it is considered there is sufficient evidence to conclude that displaced golden plover territories have sufficient habitat in proximity to re-distribute to, without there being any loss to the population. From the desk study work completed for the cumulative assessment relating to the Caithness and Sutherland Peatlands SPA, the baseline data suggest in the region of 35 golden plover territories could be displaced (equivalent to approximately 1.1%). Therefore, the cumulative impact on the NHZ5 golden plover populations is predicted to be of **negligible** magnitude and **not significant**.

Golden eagle

- 9.301 Golden eagle are a qualifying interest of the Caithness and Sutherlands Peatland SPA/Ramsar site as a breeding species, with the SPA holding five pairs in 1992, equivalent to 1% of the GB population. The number of golden eagles within the SPA at any one time will, however, be greater, given that in addition to these breeding pairs, depending on the time of year, there will also be non-territorial adult birds and sub-adults active within this very large, designated site.
- 9.302 The regional golden eagle population is estimated to be Wilson *et al.* (2015) give the NHZ population of 18 territories. Challis *et al.* (2023) give 2022 figures from the Scottish Raptor Monitoring Scheme, derived from the monitoring completed by the HRSG, of 129 territories in Highland, of which 29 fall within Sutherland. Given the ranging distances golden eagle cover, the Highland population is a more appropriate scale to assess regional effects against, compared to NHZ5.

9.303 Whilst construction and decommissioning risks from displacement were negligible (and temporary and reversible), the predicted operational effect from golden eagles colliding with turbines was that between zero and two birds would be killed over the lifetime of the proposed development, an impact that was assessed as **minor** magnitude and **not significant**. A CIA is therefore considered justified, and whilst this is to assess the cumulative impact on the regional population, it can also be used when considering in combination effects, if considered helpful.

Cumulative collision effects: golden eagle

- 9.304 The low level of golden eagle 'at risk' flight activity recorded during the two years' surveys shows that limited use is made by golden eagles of the airspace above the proposed development. As detailed in Technical Appendix 9.2, and summarised paragraphs 9.138 above, the predicted collision rate from the proposed development is therefore very low, at 0.03 birds/year, equivalent to one golden eagle every 33 years (therefore approximately one golden eagle over the 35-year lifetime of the proposed development).
- 9.305 As explained in Section 4.1 of Technical Appendix 9.2, to attempt to account for variation in flight activity and the inherent uncertainty in CRM, accounting for the assumptions in the CRM process and the range of variability in flight activity, collision rates could vary between 0.00 - 0.07 birds/year, equating to no collisions to a maximum of one golden eagle every 15 years (or two over the lifetime of the wind farm).
- 9.306 NatureScot maintains a spreadsheet of predicted collision rates for wind farms in proximity to the Caithness and Sutherland Peatlands SPA/Ramsar site. The details from this compilation are provided in Table 9.27.

Table 9.27: Summary of assessment of potential effects on golden eagle

Wind Farm	Status	NHZ	Estimated no. of birds killed per annum for the wind farm as calculated by NatureScot at 99% avoidance
Achairn	Application	5	0
Achany	Operational	5	0
Achany Extension	Consented	5	0.115
Acheilidh	Application	5	0.040
Ballie	Operational	2	0
Bettyhill	Operational	5	0.004
Bettyhill 2	Approved	5	0
Braemore	Consented	5	0
Boulfruich	Operational	5	0
Burn of Whilk	Operational	5	0.012
Camster	Operational	5	0
Causeymire	Operational	5	0
Causeymire Extension	Operational	5	0

Wind Farm	Status	NHZ	Estimated no. of birds killed per annum for the wind farm as calculated by NatureScot at 99% avoidance
Chleansaid	Approved	5	0.47
Creag Riabhach	Operational	5	0.04
Flex Hill	Operational	2	0
Forss 2	Operational	2	0
Garvary	Application	5	0.094
Gordonbush	Operational	5	0.066
Gordonbush Extension	Operational	N/A	N/A
Halsary	Operational	5	0
Kilbraur	Operational	5	0
Kilbraur Extension	Refused	5	0
Kirkton Energy Park	Appeal	5	0.016
Lairg	Operational	5	0.007
Lairg 2	Approved	5	0.031
Melness	Operational	5	0
Rosehall	Operational	5	0
Sallochay	Consented	5	0.096
Shinness	Application	5	0.090
Strathy North	Operational	5	0.039
Strathy South	Construction	5	0.009
Strathy Wood	Construction	N/A	N/A
Stroupster/Hill of Stroupster	Operational	2	0
Wathegar	Operational	2	0
Total			1.129

9.307 For the wind farms that had data available, and taking wind farm status into account, the cumulative/in combination number of golden eagle collisions predicted by CRM would be approximately 1.3 birds a year from these sites, based on the current standard 99% avoidance rate.

9.308 However, in light of the typical 300m avoidance evident from the research findings of Alan Fielding and co-workers (Whitfield *et al.* 2017, Fielding *et al.* 2017, 2021, 2022, 2023, 2024a, 2024b), the actual rate of cumulative collision would be much lower than this, given the higher rate of avoidance birds evidently apply. A figure of half of the predicted CRM rate would still be precautionary, with 0.65 birds a year representing 0.25% of the 129 territorial adults in Highland region. Given that not all birds predicted to collide would be adults, and the additional non-territorial and sub-adult golden eagle population present, the cumulative percentage would be even lower than this.

- 9.309 Therefore, in EIA terms, the cumulative impact on the regional population is therefore predicted to be of **negligible** magnitude and **not significant**. Although the eagle territory north of the proposed development does not have SPA-connectivity, even if it did, there would not be an in combination adverse effect on its conservation objectives in relation to golden eagle, as it would also be of **negligible** magnitude and **not significant**.

White-tailed eagle

- 9.310 White-tailed eagle are of regional nature conservation importance.
- 9.311 The species' regional population is increasing so figures of one pair provided by Wilson *et al.* (2015) for the NHZ5 population is significantly out of date. More up-to-date population figures (albeit not specific to the NHZ5 area) are provided by Challis *et al.* (2023), who report 2022 figures from the Scottish Raptor Monitoring Scheme, derived from the monitoring completed by the HRSG, of 67 territories in Highland, of which nine fall within Sutherland.
- 9.312 The assessment of effects on white-tailed eagle from the proposed development concluded there were no significant effects predicted, either from construction, operation or decommissioning. Whilst construction and decommissioning risks from displacement were negligible (and temporary and reversible), the predicted operational effect from white-tailed eagles colliding with turbines was of **negligible** magnitude and **not significant** in EIA terms. A CIA was therefore considered justified, to assess the cumulative impact on the regional population. Given the very large-scale range of this species, the Scottish population is considered to be the appropriate scale to assess cumulative regional effects for white-tailed eagle.

Cumulative collision effects: white-tailed eagle

- 9.313 Given that a cumulative impact assessment at the regional scale would require all wind farms in Scotland to be considered, this is clearly beyond the scope of any individual EIA. However, a surrogate exists for this assessment in the population modelling carried out by Sansom *et al.* (2016n). This tested future scenarios of population change taking account of additional sources of mortality and concluded the white-tailed eagle population would continue to expand at a substantial rate. It is evident therefore that the cumulative impact of collision mortality on this species would be of **negligible** magnitude and **not significant** in EIA terms.

Habitats Regulations Appraisal (Caithness and Sutherland Peatlands SPA/Ramsar Site)

- 9.314 From the desk study and consultation responses, the Caithness and Sutherland Peatlands SPA is the only SPA that needs to be screened in for the HRA. Information therefore needs to be provided to inform an appropriate assessment of the proposed development by the competent authority. The information needs to cover the potential effects of the project alone and in combination with other plans and projects which could have an in-combination effect on the integrity of the SPA.

- 9.315 Drawing on the baseline desk study and survey data, the assessment of potential effects and the CIA all provided above, this section of the Ornithology Chapter provides the information to inform the HRA, taking account of European Commission guidance on the appropriate assessment process (European Commission 2000, 2011) whilst also keeping the information brief and avoiding unnecessary repetition where possible.
- 9.316 The SPA is clearly within connectivity distance of several of its 11 qualifying species (set out in Table 9.5) and therefore the proposed development does have the potential for likely significant effect on the SPA's integrity.
- 9.317 Of the 11 species however, hen harrier, wood sandpiper, short-eared owl and wigeon were not recorded during baseline surveys and there were no desk study records from the HRSG or RSPB of these species within the data search buffers. There is consequently no LSE on any of these SPA qualifying species.
- 9.318 The purpose of the HRA is to determine, beyond reasonable scientific doubt, whether or not the proposed wind farm will compromise the conservation objectives of the SPA, thereby having an adverse effect on site integrity. Therefore, the conservation objectives are described below.
- 9.319 The potential for adverse effects on the remaining SPA/Ramsar qualifying species is assessed below.

Caithness and Sutherland Peatlands SPA Conservation Objectives

- 9.320 The conservation objectives of the SPA, which also pertain to the Ramsar Site, are:
1. To avoid deterioration of the habitats of the qualifying species or significant disturbance to qualifying species, thus ensuring that the integrity of the site is maintained; and
 2. To ensure for the qualifying species that the following are maintained in the long term:
 - a) Population of the species as a viable component of the site;
 - b) Distribution of the species within the site;
 - c) Distribution and extent of habitats supporting the species;
 - d) Structure, function and supporting processes of habitats supporting the species;
 - e) No significant disturbance of the species.
- 9.321 The potential effects of the proposed developments of each of the SPA qualifying species recorded during the October 2022 to August 2024 surveys have been assessed against each conservation objective. The results of these assessments are presented in Table 9.28.

Table 9.28: Information to inform the appropriate assessment

Conservation objective	Assessment of effects
To avoid deterioration of the habitats of the	As demonstrated in Chapter 8: Ecology, through the design of the development footprint, specifically keeping well within the conifer plantation, it is predicted with a high degree of certainty that there

Conservation objective	Assessment of effects
qualifying species or significant disturbance to qualifying species, thus ensuring that the integrity of the site is maintained;	would be no deterioration of habitats within the SPA from the proposed development. As demonstrated in this Chapter, the only SPA species where disturbance or displacement may have a long-term effect would be golden plover, where up to two territories could potentially be displaced by the construction and operation of the proposed wind farm, assuming displacement occurred out to 500m. Significant evidence does exist that applying a 500m displacement buffer is over-precautionary, and whilst a proportion of this post-construction monitoring evidence has not subject to peer review, it has the advantage of being from wind farms within the Highland region of Scotland and is therefore most likely to be applicable in assessing the potential impact of the proposed development. Whilst it cannot be guaranteed, the findings from Ward (2024) do suggest that birds from two displaced territories could be accommodated within the SPA. Even if this was not the case, and two territories were lost to the SPA population, set against the SPA population, it is not considered that this would prevent the integrity of the SPA from being maintained in the long-term. An in-combination assessment has been carried out to quantify the potential disturbance and displacement of golden plover where developments are within 500m of the SPA. A precautionary approach has been taken for this compilation, resulting in an estimated 18 golden plover territories being potentially displaced from the SPA (assuming displacement occurs out to 500m). In the context of the whole SPA area, and its population, it is evident from the work of Ward (2024) that density dependence would not prevent all these displaced territories being accommodated within the SPA, given densities have declined from 21% since 2004. Therefore, even taking account of a precautionary displacement extent, the predicted effect of displacing 18 territories would not prevent the integrity of the SPA being maintained in the long term.
To ensure for the qualifying species that the following are maintained in the long term: a) Population of the species as a viable component of the site;	As highlighted in the row above, golden plover was the only qualifying species where impacts on SPA territories from the proposed development was predicted. For the reasons given, it is considered with a high degree of confidence that even taking a highly precautionary approach, the golden plover population of the SPA will be maintained in the long-term, taking account of the project alone and in combination with other plans and projects. Although survey and desk study data show the nearest golden eagle territory is not connected to the SPA, as golden eagle is a SPA qualifying species, and for the avoidance of doubt, a full assessment has been completed of potential effects from the proposed development and in combination with other plans and projects. Evidence from peer reviewed Scotland-based research gives a high degree of confidence in the assessment findings, that the SPA's golden eagle population will be maintained in the long-term.
To ensure for the qualifying species that the following are maintained in the long term: b) distribution of the species within the site;	The potential for affecting the distribution of species within the SPA has been minimised through the design of the development footprint, specifically keeping well within the conifer plantation. Therefore, as highlighted, the only species where any localised effect on distribution may occur is golden plover. Data from the 2023 and 2024 breeding season show that distribution of golden plover varies from year to year, so there would be no effect on distribution of golden plover territories part of the time, even at the very local level. Even in years where golden plover territories may have been centred within 500m of the wind farm but are displaced or lost, given the size

Conservation objective	Assessment of effects
	of the site, and the pre-existing effect of the forest plantation on distribution, the proposed development is not predicted to adversely effect the distribution of golden plover or any other qualifying species over the lifetime of the wind farm.
To ensure for the qualifying species that the following are maintained in the long term: c) distribution and extent of habitats supporting the species;	As demonstrated in Chapter 8: Ecology, through the design of the development footprint, specifically keeping well within the conifer plantation, it is predicted with a high degree of certainty that there would be no effect on habitats, including their distribution and extent. Through the retention of plantation along the moorland edge, this includes potential habitat for nesting merlin (albeit this is outside the SPA and there is no effect on the moorland habitat within the SPA where merlin also may nest).
To ensure for the qualifying species that the following are maintained in the long term: d) structure, function and supporting processes of habitats supporting the species;	As demonstrated in Chapter 8: Ecology, through the design of the development footprint, specifically keeping well within the conifer plantation, it is predicted with a high degree of certainty that there would be no effect on the structure, function and supporting processes of habitats supporting the SPA's qualifying species.
To ensure for the qualifying species that the following are maintained in the long term: e) no significant disturbance of the species.	The potential for disturbing species within the SPA has been minimised through the design of the development footprint, specifically keeping well within the conifer plantation and retaining the conifer plantation around the edge of the construction and operational areas. Further embedded mitigation, notably the production of a Breeding Bird Protection Plan and deployment of a full-time suitably experienced ECoW during the entire bird breeding season will ensure there is no disturbance to any SPA qualifying species.

9.322 The information provided in this Chapter, in tandem with the habitat information in Chapter 8: Ecology, provides evidence that the proposed development, would not have an adverse effect on the integrity of the Caithness and Sutherlands Peatlands SPA (and therefore also on the Ramsar site). This is either alone or in combination with other plans and projects. This is predicted by incorporating a precautionary approach to interpretation of evidence and combines data and insights from published and highly relevant unpublished Highlands or Scottish post-construction monitoring data on bird/wind farm interactions. It is considered that the conclusions reached are beyond reasonable doubt and are based on the available scientific evidence.

Mitigation Measures and Monitoring

Mitigation

9.323 Following the implementation of embedded mitigation measures, no requirements for further mitigation measures were identified, either during construction, operation or decommissioning.

Residual Effects

Construction

- 9.324 There are no predicted residual effects predicted from the proposed development, provided all aspects of embedded mitigation are fully implemented.

Operation

- 9.325 Other than the potential displacement of up to two golden plover territories, there are no predicted residual effects predicted from the proposed development, provided all aspects of embedded mitigation are fully implemented.

Decommissioning

- 9.326 There are no predicted residual effects predicted from the proposed development, provided all aspects of embedded mitigation are fully implemented.

Monitoring

- 9.327 A degree of uncertainty can be inherent in the prediction of development effects on biological receptors, so post-consent monitoring of development impacts can form part of an application or be required as a condition of consent.
- 9.328 Guidance on when monitoring is appropriate is provided by the EIA Directive 2014/52/EU, which stipulates that monitoring is required when significant adverse effects are predicted. The EIA (Scotland) 2017 Regulations implement the EIA Directive (with Regulation 30 specifically dealing with 'Monitoring Measures') in combination with the Scottish Government's Planning Circular 1/2017 and Planning Advice Note 1/2013. Both documents provide further guidance on when monitoring should be considered and what its function is. Paragraph 136 of Circular 1/2017 explains it should be restricted to 'monitoring, where appropriate, the effectiveness of any measures to avoid, prevent, reduce or offset significant adverse effects of the development identified through the EIA process'. The Scottish Government's Planning Advice Note (PAN) 1 explains further (in para. 4.31A) the purpose of monitoring is to gauge the effectiveness of any mitigation measures identified through the EIA process. CIEEM (2018) Guidance also sets out advice on monitoring requirements, noting (in paragraph 6.28) that where mitigation measures are routinely applied and can be relied upon to deliver, monitoring is unlikely to be necessary, so long as the competent authority is able to enforce the measures. 'However, where there are uncertainties in predicting the effectiveness of measures, or mitigation packages are novel, monitoring will be required to determine whether the predicted efficacy of the mitigation meets expectations'.
- 9.329 The assessment of the proposed development's effects on target species predicts, drawing on a range of evidence of bird/wind farm interactions, including from Caithness and Sutherlands, that no significant adverse effects are anticipated, either alone or cumulatively/in combination, although there may be displacement of between zero and two golden plover territories. Furthermore, the proposed development's embedded mitigation measures are well tried and tested, with a high degree of confidence in their

effectiveness, providing (i) the ECoW appointed has sufficient experience to ensure all bird protection measures are fully implemented, and (ii) the forestry and main contractor adhere to the CEMP and advice of the ECoW. Therefore, no additional monitoring is considered necessary.

Summary

- 9.330 Table 9.29 below summarises the effects on key receptors, from the project and cumulatively/in combination with other plans and projects. It also highlights any mitigation measures and residual effects.

Table 9.29: Summary of Effects

Receptor	Sensitivity	Predicted Impact Characterisation	Significance before mitigation	Summary of Mitigation	Residual Effect
Golden eagle	International importance	Habitat loss/modification from construction	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Disturbance from construction	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Disturbance or displacement during operation	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Collision during operation	Minor impact. Not significant at NHZ, National of UK level	None required	Minor impact. Not significant.
		Disturbance from decommissioning	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
Dunlin, Greenshank	International importance	Habitat loss/modification from construction	Minor impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Disturbance from construction	Minor impact. Not significant at NHZ, National of UK level	Embedded mitigation to prevent disturbance to Annex 1 birds and nest destruction for any species.	Negligible impact. Not significant.
		Disturbance or displacement during operation	Minor impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Collision during operation	Minor impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Disturbance from decommissioning	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
Golden plover	International importance	Habitat loss/modification from construction	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Disturbance from construction	Negligible impact. Not significant at NHZ, National of UK level	Embedded mitigation to prevent disturbance to Annex 1	Negligible impact. Not significant.

Receptor	Sensitivity	Predicted Impact Characterisation	Significance before mitigation	Summary of Mitigation	Residual Effect
				birds and nest destruction for any species.	
		Disturbance or displacement during operation	Minor impact. Not significant at NHZ, National of UK level	None required	Minor impact. Not significant.
		Collision during operation	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Disturbance from decommissioning	Negligible impact. Not significant at NHZ, National of UK level	Embedded mitigation to prevent disturbance to Annex 1 birds and nest destruction for any species.	Negligible impact. Not significant.
Merlin	International importance	Habitat loss/modification from construction	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Disturbance from construction	Negligible impact. Not significant at NHZ, National of UK level	Embedded mitigation to prevent disturbance to Annex 1 birds and nest destruction for any species.	Negligible impact. Not significant.
		Disturbance or displacement during operation	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Collision during operation	Minor impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Disturbance from decommissioning	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Habitat loss/modification from construction	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
Caithness and Sutherland Peatlands RAMSAR	International importance	Adverse effect on conservation objectives	No adverse effects on conservation objectives, alone or in combination, beyond reasonable scientific doubt	Embedded mitigation to prevent disturbance to Annex 1 birds and nest destruction for any species.	Negligible impact. Not significant.

Receptor	Sensitivity	Predicted Impact Characterisation	Significance before mitigation	Summary of Mitigation	Residual Effect
Strath Duchally SSSI	National Importance	Negative effect on features of scientific interest	Negligible impact. Not significant at a national level.	Embedded mitigation to prevent disturbance to Annex 1 birds and nest destruction for any species.	Negligible impact. Not significant.
White-tailed eagle, Black grouse	Regional Importance	Habitat loss/modification from construction	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Disturbance from construction	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Disturbance or displacement during operation	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Collision during operation	Minor impact. Not significant at NHZ, National of UK level	None required	Minor impact. Not significant.
		Disturbance from decommissioning	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
Whooper swan, Pink-footed geese, Mallard, Snipe	Local Importance	Habitat loss/modification from construction	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Disturbance from construction	Negligible impact. Not significant at NHZ, National of UK level	Embedded mitigation to prevent disturbance to Annex 1 birds and nest destruction for any species.	Negligible impact. Not significant.
		Disturbance or displacement during operation	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Collision during operation	Negligible impact. Not significant at NHZ, National of UK level	None required	Negligible impact. Not significant.
		Disturbance from decommissioning	Negligible impact. Not significant at NHZ, National of UK level	Embedded mitigation to prevent disturbance to Annex 1 birds and nest destruction for any species.	Negligible impact. Not significant.

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Coille Linne Wind Farm

Environmental Impact Assessment Report Volume I Chapter 10: Hydrology, Geology and Peat

May 2025

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10 HYDROLOGY, GEOLOGY AND PEAT

Introduction

- 10.1 This chapter considers the potential effects of Coille Linne Wind Farm (the 'proposed development') on hydrology, geology, and peat.
- 10.2 This chapter is also supported by the following figures as contained within EIA Volume 2: Figures:
- Figure 10.1: Superficial Geology;
 - Figure 10.2: Bedrock Geology;
 - Figure 10.3: Soils Mapping;
 - Figure 10.4: Regional Hydrogeology;
 - Figure 10.5: Groundwater Vulnerability;
 - Figure 10.6: Hydrological Features; and
 - Figure 10.7: Private Water Supplies.
- 10.3 The chapter is supported by a number of Technical Appendices (as set out within Volume 4: Technical Appendices), comprising:
- Technical Appendix 10.1: Outline Water Crossing Inventory;
 - Technical Appendix 10.2: Outline Peat Slide Risk Assessment
 - Technical Appendix 10.3: Outline Peat Management Plan; and
 - Technical Appendix 10.4: Carbon Calculator.
- 10.4 Other relevant chapters include Chapter 8: Ecology.
- 10.5 The author of this Chapter, Stuart Clarke BSc (Hons) MSc, has approximately 10 years of relevant experience in geology and ground conditions baseline assessments and preparation of EIA Chapters and associated technical appendices (desk studies, peat management plans, peat landslide hazard risk assessment, carbon balance assessments, remediation strategies) relating to geology and ground conditions (including hydrogeology, peat and contaminated land) for a range of renewable energy (onshore wind, onshore elements of offshore wind, solar, BESS) and infrastructure developments across Northern Ireland and Scotland.
- 10.6 The reviewer of this Chapter, David Gemmell BSc (Hons) MSc, a chartered Environmentalist and Scientist, has approximately 20 years of relevant experience in in ground conditions (including hydrogeology) baseline assessments and preparation of EIA Chapters and associated technical appendices (desk studies, peat management plans, peat landslide hazard risk assessment, carbon balance assessments, remediation strategies) relating to geology and ground conditions (including hydrogeology, peat and contaminated land)

for a range of renewable energy (onshore wind, onshore elements of offshore wind, solar, BESS), infrastructure and mining developments across Western Australia, the UK and particularly Scotland.

Legislation, Policy, and Guidance

Legislation

- 10.7 Regulation of activities relating to the water environment in Scotland is the responsibility of the Scottish Environment Protection Agency (SEPA) and the relevant local authorities.
- 10.8 The European Union (EU) *Water Framework Directive* (WFD) has been implemented in Scotland through the *Water Environment and Water Services (Scotland) Act 2003* (WEWSA). This Act introduced a regulatory system for the water environment with SEPA as the lead authority working alongside the public, private and voluntary sectors. The Act ensures that all human activities with the potential to cause a harmful effect on the water environment can be controlled by establishing a framework for co-ordinated controls on water abstraction and impoundment, engineering works affecting watercourses, and discharges to the water environment.
- 10.9 The EC Groundwater Directive provides specific measures to protect groundwater against pollution and deterioration. This Directive is implemented through the *Water Environment (Controlled Activities) (Scotland) Regulations 2011* (CAR) (as amended), introduced under WEWSA to provide the main regulatory controls for protecting the water environment from harm. CAR introduced specific controls for activities affecting watercourses and waterbodies and which encompass the following activities relevant to the Proposed Development:
- Discharges to all wetlands, surface waters and groundwaters; and,
 - Engineering works in inland waters and wetlands.
- 10.10 SEPA maintains water monitoring and classification systems that provide the data to support the aim of the WFD, namely that all waterbodies would have good ecological status, or similar objective, by 2015. The classification system covers all rivers, lochs, transitional, coastal and groundwater bodies, and is based on an ecological classification system with five quality classes: High, Good, Moderate, Poor, and Bad. It has been devised following EU and UK guidance and is underpinned by a range of biological quality elements, supported by measurements of chemistry, hydrology (changes to levels and flows) and morphology (changes to the shape and function of waterbodies).
- 10.11 The *Water Resources (Scotland) Act 2013* makes provisions for the development of Scotland's water resources through improved water quality, the creation of contracts for non-domestic sewerage services, protection of the public sewer network and the maintenance of private sewerage works.
- 10.12 The relevant legislation relating to flood prevention is the *Flood Risk Management (Scotland) Act 2009*, which replaces the *Flood Prevention (Scotland) Act 1961* (as amended).
- 10.13 UK legislation on contaminated land is principally contained in Part IIA of the *Environmental Protection Act 1990* (EPA). This legislation endorses the principle of a 'suitable for use' approach to contaminated land, where remedial action is only required

if there are unacceptable risks to health or the environment, taking into account the use of the land and its environmental setting.

- 10.14 The Environment Act 1995 creates a system whereby local authorities must identify and, if necessary, arrange for the remediation of contaminated sites. The provisions are set out in Section 57, which inserts Part IIA into the EPA 1990. In addition to these requirements, the operation of the regime is subject to regulation and statutory guidance.
- 10.15 The Contaminated Land (Scotland) Regulations 2000 (as amended) sets out the responsibilities of authority and SEPA in the identification and management of contaminated land. Scottish Planning Policy, is also used to address contaminated land through the planning process, following the same principles as those set out under Part 2A.

Policy

- 10.16 Chapter 5: Renewable Energy and Planning Policy of the EIA Report sets out the planning policy framework that is relevant to the EIA process and the proposed development. The policies set out include those from the Highland Wide Local Development Plan (LDP), National Planning Framework 4 (NPF4) and other relevant guidance.
- 10.17 NPF4 contains policies with relevance to Hydrology, Geology and Peat including Policy 5 (Soils), which states the following:
- Development proposals on peatland, carbon-rich soils and priority peatland habitat will only be supported for the generation of energy from renewable sources that optimises the contribution of the area to greenhouse gas emissions reductions targets. Where development is proposed on peatland, carbon-rich soils, or priority peatland habitat, a detailed site-specific assessment will be required to identify the following:
 - The baseline depth, habitat condition, quality, and stability of carbon-rich soils;
 - The likely effects of the development on peatland, including on soil disturbance; and
 - The likely net effects of the development on climate emissions and loss of carbon.
 - This assessment should inform careful project design and ensure, in accordance with relevant guidance and the mitigation hierarchy, that adverse impacts are first avoided and then minimised through best practice. A Peat Management Plan (PMP) will be required to demonstrate that this approach has been followed, alongside other appropriate plans required for restoring and / or enhancing the site into a functioning peatland system capable of achieving carbon sequestration.
- 10.18 The following policies within the Highland Wide LDP are also considered to be of relevance to the hydrological, geological (including peat) and hydrogeological assessment presented within this chapter:
- Policy 28: Sustainable Design – This policy states that developments will be assessed on the extent to which they, make use of brownfield sites, existing buildings and recycled materials, impact on non-renewable resources such as mineral deposits of potential commercial value and prime quality agricultural land and demonstrate sensitive siting and design in keeping with the natural environment and in making use of appropriate materials;

- Policy 53: Minerals – This policy specifically states borrow pits that are near to or on the site of the associated development will be supported if it can be demonstrated that they are the most suitable source of material, are time limited and that appropriate environmental safeguards are in place for the workings and the reclamation.
- Policy 55: Peat and Soils - This policy specifically states that development proposals should demonstrate how they will avoid unnecessary disturbance of peat and soils, and that unacceptable peat disturbance would not be permitted unless it is shown that the adverse effects of this are outweighed by social, environmental, or economic benefits. It also states that where development on peat is clearly unavoidable, a peat management plan demonstrating how impacts have been minimised and mitigated may require to be submitted.
- Policy 62: Geodiversity – This policy states that development proposals that include measures to protect and enhance geodiversity interests of international, national, and regional/local importance in the wider countryside, will be supported.
- Policy 63: Water Environment – This policy states that proposals for development that do not compromise the objectives of the Water Framework Directive (2000/60/EC), will be supported.
- Policy 64: Flood Risk – This policy states that development proposals should avoid areas susceptible to flooding and promote sustainable flood management.
- Policy 66: Surface Water Drainage – This policy states that the proposed development must be drained by Sustainable Drainage Systems (SuDS) designed in accordance with The SuDS Manual ((CIRIA C697) and, where appropriate, the Sewers for Scotland Manual 2nd Edition.
- Policy 72: Pollution – This policy states that major developments and developments that are subject of Environmental Impact Assessment will be expected to follow a robust project environmental management process.

Guidance

10.19 The following relevant guidance has been considered as part of the assessment of hydrology, geology, and peat:

- SEPA (2009) - Temporary Construction Methods (WAT-SG-29);
- SEPA (2017) Guidance for Pollution Prevention (GPP) 5: Works and maintenance in or near water;
- SEPA (2021) Supporting Guidance (WAT-SG-75) – Sector Specific Guidance: Water Run-Off from Construction Sites;
- SEPA (2016) The Water Environment (Controlled Activities) (Scotland) Regulations (as amended) - A Practical Guide;
- SEPA (2017) Land Use Planning System Guidance Note 4 (LUPS GU4) - Planning guidance on on-shore windfarm developments;
- SEPA (2006) Guidelines for Water Pollution Prevention from Civil Engineering Contracts, Special Requirements';
- SEPA (2009) Policy 19 Groundwater Protection Policy for Scotland (Version 3);
- CIRIA (2001) C532: 'Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors';

- SEPA (2012) PPG6: Working at Construction and Demolition Sites;
- NatureScot (2019) Good Practice During Wind Farm Construction;
- NatureScot (2023) Advising on peatland, carbon-rich soils, and priority peatland habitats in development management;
- Scottish Government, SNH, SEPA (2017) Guidance on Developments on Peatland - Peatland Survey (2017); and
- Developments on Peatland: Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste (Scottish Renewables and SEPA, 2014).
- Developments on Peat and Off-Site Uses of Waste Peat (SEPA, 2017)

Consultation

- 10.20 As part of the Scoping exercise, consultation was undertaken to inform the design of the proposed development and to seek agreement on potential significant environmental effects that result from the proposed development as well as the scope of any assessment work required as part of this EIA.
- 10.21 The Scoping Opinion was received from the Scottish Government Energy Consents Unit (ECU) on 20th September 2024.
- 10.22 Consultation relevant to the hydrology, geology and peat was undertaken with NatureScot, The Highland Council and SEPA who commented on aspects of methodology, sources of information, scope of assessment and cumulative development. A summary of these consultation responses is provided in Table 10.1.

Table 10.1: Consultation Responses

Consultee	Date Received	Consultation Response	Where and how is this addressed?
The Highland Council	13 th September 2024	The Highland Council indicated the following: The EIAR should include a full assessment on the impact of the development on peat. The assessment of the impact on peat must include peat probing for all areas where development is proposed including microsites.	Several phases of peat probing works have been completed within the development site. These works have included buffer areas around proposed infrastructure locations to allow for microsites. The results of this have been used to inform the development design with a view to avoiding sensitive areas and areas of deep peat. An outline Peat Management Plan and an outline Peat Slide Risk Assessment are provided in Technical Appendices 10.2 and 10.3, respectively.

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		Carbon balance calculations should be undertaken and included within the EIAR with a summary of the results provided focussing on the carbon payback period for the wind farm.	Carbon payback periods are discussed in Chapter 3: Project Description. Carbon balance calculations are presented in Technical Appendix 10.4.
		The EIAR should fully describe the likely significant effects of the development on the local geology including aspects such as borrow pits, earthworks, site restoration and the soil generally including direct effects and any indirect. Proposals should demonstrate construction practices that help to minimise the use of raw materials and maximise the use of secondary aggregates and recycled or renewable materials. Where borrow pits are proposed the EIAR should include information regarding the location, size, and nature of these borrow pits including information on the depth of the borrow pit floor and the borrow pit final reinstated profile. This can avoid the need for further applications.	Proposed borrow pits search areas are discussed in Chapter 3: Project Description and paragraphs 10.91 to 10.96.
		The Highland Council note that the development will be located adjacent to the Flow Country World Heritage Site (WHS), which is protected for its globally important blanket bog ecosystem. The Outstanding Universal Value (OUV) of the site encompasses several attributes relating to blanket bog habitat and ecosystem processes. It is noted that if the proposal affects one or more of these attributes this could result in impact to the site's OUV. Direct and	The Highland Council Toolkit has been considered for criterion (ix) and the outcome of this is discussed in paragraph 10.52

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		indirect impacts to the WHS must be considered within the EIAR and reference should be made to The Highland Council's toolkit.	
		The EIAR needs to address the nature of the hydrology and hydrogeology of the site, and of the potential impacts on water courses, water supplies including private supplies, water quality, water quantity and on aquatic flora and fauna. Impacts on watercourses, lochs, groundwater, other water features and sensitive receptors, such as water supplies, need to be assessed.	Details of site hydrology, hydrogeology and private water supplies are discussed in paragraphs 10.69 to 10.73 and 10.79 to 10.88.
		The EIAR will be expected to identify all water crossings and include a systematic table of watercourse crossings or channelising, with detailed justification for any such elements and design to minimise impact.	Details of proposed new and altered water crossings are provided in Technical Appendix 10.4. Water crossings are discussed in paragraphs 10.89 to 10.90.
		The need for, and information on, abstractions of water supply for concrete works or other operations should be identified.	Arrangements for water abstractions are discussed in paragraph 10.148.
		The applicant will be required to carry out an investigation to identify any private water supplies, including pipework, which may be adversely affected by the development and to submit details of the measures proposed to prevent contamination or physical disruption.	A map of private water supply (PWS) abstractions provided in consultation with The Highland Council and associated buffers is provided as Figure 10.7. Potential effects on PWS are discussed in paragraphs 10.79 to 10.83.

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		The EIAR should include an assessment of the effects on Ground Water Dependent Terrestrial Ecosystems (GWDTE).	A map of potential GWDTEs identified from an NVC survey, and associated buffers is provided in Chapter 8: Ecology and Technical Appendix 8.1: Habitat Survey Report. Potential effects on GWDTEs are discussed in paragraphs 10.74 to 10.78.
Kyle of Sutherland District Salmon Fishery Board (KSDSFB)	7 th August 2024	KSDSFB indicate that they would expect the environmental assessment to include a peat slide risk assessment.	An outline Peat Slide Risk Assessment is provided in Technical Appendix 10.3.
NatureScot	26 th August 2024	NatureScot highlight that the application site lies partially within the Flow Country WHS and that the Highland Council Toolkit is used to consider impacts to the WHS for criterion (ix) peatland ecosystem quality only.	The Highland Council Toolkit has been considered for criterion (ix) and the outcome of this is discussed in paragraph 10.52
		NatureScot highlight that the application site includes areas mapped as Class 1 peatland and that an assessment of peatland condition should be provided in the EIAR. NatureScot also indicate that Development proposals on peat should be supported by a site-specific and detailed peat survey, a Peat Management Plan, and a Peat Landslide Hazard Risk Assessment (PLHRA), which should be used to inform the project design and siting and to ensure compliance with mitigation hierarchy.	An outline Peat Management Plan is provided in Technical Appendix 10.2, which presents the results of peat surveys undertaken at the site and details how peat will be managed during the proposed construction works. An outline Peat Slide Risk Assessment is also provided in Technical Appendix 10.3.
SEPA	10 th July 2024	SEPA indicated that the following items must be submitted with the EIA:	
		A drawing highlighting all proposed temporary or permanent infrastructure overlain with all lochs and	A site layout plan providing details of temporary and permanent infrastructure overlain with all watercourses

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		watercourses (including 50m buffer).	is presented in Chapter 3: Project Description
		Map showing location, size, depth, and dimensions of all borrow pits.	Proposed borrow pits are discussed in Chapter 3: Project Description and paragraphs 10.91 to 10.100.
		Drawings highlighting interpolated peat depth survey data and an Outline Peat Management Plan	An outline Peat Management Plan (including interpolated peat depth drawings) is provided in Technical Appendix 8.2.
		A drawing highlighting the location of GWDTEs and existing groundwater abstractions (inc. buffers)	A map of potential GWDTE's identified from an NVC survey and associated buffers is provided in Chapter 8: Ecology and Technical Appendix 8.1: Habitat Survey Report. Potential effects on GWDTE are discussed in paragraphs 10.74 to 10.78.
		Schedule of mitigation including pollution prevention measures	Mitigation measures are set out in paragraphs 10.134 – 10.173 and summarised in the Schedule of Mitigation in Chapter 16.
		e) Proposals for Life Extension, Repowering and Decommissioning	Outline proposals for the development in the future are provided in Chapter 3: Project Description and effects are assessed in this chapter as appropriate.
The Highland Council	17 th January 2025	Consultation relating to private water supplies. The Highland Council provided information on activities registered or licensed under the Controlled Activities Regulations in the vicinity of the site.	A map of private water supply (PWS) abstractions provided in consultation with The Highland Council and field observations during site visits is provided as Figure 10.7. Potential effects on PWS are discussed in paragraphs 10.79 to 10.83.
SEPA	21 st October 2024	Following completion of the Phase 2 peat survey, SEPA were consulted (by way of teams call where peat depth mapping was shared) to seek their feedback on the 'design chill' development layout and its potential impact upon peat. SEPA had a	Consultation feedback from SEPA has helped to guide the approach to design iteration and to minimise any impacts on peat (refer Technical Appendix 10.2 Outline Peat Management Plan). See also SEPA email chain of 29 October 2024 (Appendix D of Appendix 10.2 Outline Peat

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		few concerns over a number of turbine locations in the vicinity of deep peat which were addressed by design iteration where possible given other constraints. See subsequent SEPA email of 29 October 2024 and the Applicants subsequent comments dated 30 October (Appendix D of Technical Appendix 8.2 Outline Peat Management Plan) for details. A third phase of peat probing (Phase 2b), using the probing patterns described above, was completed by RPS in December 2024 following the amendment of the infrastructure alluded to by the Applicant in their email of 30 October 2024, along with other infrastructure amendments made. No further correspondence was received from SEPA following issue of the Applicants email of 30 October 2024.	Management Plan) for details.

Assessment Methodology and Significance

Scope of Assessment

Consultation

- 10.23 As noted in the previous Section, consultation has been undertaken with The Highland Council, Kyle of Sutherland District Salmon Fishery Board, NatureScot and SEPA. Responses and relevant considerations are noted in Table 10.1.

Study Area

- 10.24 The study area has incorporated the area within the site boundary and this assessment also considers any potential hydrological and hydrogeological effects up to 2km from any proposed infrastructure (see Figure 3.1).

- 10.25 The location of private water supplies (PWS) within 1km of the proposed new infrastructure have been identified following consultations with The Highland Council, site survey work and a review of available OS mapping.
- 10.26 The criteria for defining the study area have been established based on the professional judgement and experience of the assessment team with regard to likely access and working areas, and with due consideration to the relevant guidance on geological, hydrological, and hydrogeological assessment.

Desk Study

- 10.27 Baseline conditions have been established primarily through desk-based research which has included:
- Consultation with SEPA, NatureScot and The Highland Council;
 - Identification of the locations and characteristics of catchments and principal watercourses and waterbodies, as shown on 1:50,000 scale OS mapping which may be affected by construction activities;
 - Identification of SEPA/WFD watercourse and waterbody classification;
 - Review of on-line SEPA flood mapping;
 - Review and collation of pertinent information on surface hydrology, flooding, climate, etc.;
 - Review of on-line British Geological Survey (BGS) geological mapping of the area, and the SNH Carbon and Peatlands Map 2016;
 - Review of drainage / surface water and hydrogeological characteristics and groundwater resource;
 - Review of NatureScot's Sitelink map to identify any protected areas that may be located on or in the vicinity of the site, such as Sites of Special Scientific Interest (SSSI) which include sites that are designated as a result of their geology and Geological Conservation Review sites (GCR);
 - Review of Scottish Geology Trust, GeoSites (2023), mapping for geological designated sites; and
 - Review of publicly available historical mapping.

Site Visit

- 10.28 Several site survey visits have been undertaken by members of the assessment team as described below:
- During peat depth survey work in autumn / winter 2024, the site was visited and surveyed extensively, with observations made of site terrain, vegetation, the nature of watercourses and their banks, ground conditions (including any evidence of peat slides / instability), the location of any unrecorded PWS and the nature and condition of existing infrastructure (e.g. tracks), where present.
 - The ten proposed water crossings were inspected during the peat survey work.

- Habitat and vegetation surveys were undertaken to provide information relevant to the identification of habitats which could represent groundwater dependent terrestrial ecosystems (GWDTE).

Peat Depth Survey

- 10.29 On the basis of the scoping responses received from The Highland Council, SEPA and NatureScot and from a review of available desk-based information including published geological mapping, the Scottish Natural Heritage (SNH) Carbon and Peatlands Map (2016) and aerial photography it was considered that peat would be present across much of the development site.
- 10.30 Peat depth surveys have subsequently been undertaken at the site over the course of three phases. Phase 1 peat probing was carried out by Wildlife Consulting in June 2024 and was undertaken across the developable area at the time to inform an understanding of general peat depth and distribution. Due to commercial forestry on site, it was not possible to complete a full 100m grid with 374 probe positions completed.
- 10.31 On the basis of the phase 1 survey data pockets of deep peat were encountered across the site and particularly in northern and eastern areas.
- 10.32 Following completion of the Phase 1 survey, the site design was reviewed, and changes were made to avoid or minimise siting infrastructure on areas of deeper peat. A 'design chill' was subsequently arrived at and a Phase 2 survey was undertaken by RPS in September 2024. The Phase 2 survey comprised detailed surveys at each proposed turbine and hardstanding location, along all proposed new access tracks/turning heads, and at other proposed infrastructure locations including the site substation, construction compound and borrow pit search areas.
- 10.33 The pattern of peat probing in relation to proposed turbine locations and other infrastructure elements can be broadly described as follows:
- Probe at each proposed turbine location plus an additional probe, approximately 25m from the turbine location to the north, south, east, and west;
 - Probes advanced on a grid at approximate 25m centres across the area of each proposed turbine hardstanding and crane pad area;
 - Probes advanced at 50 m centres along the proposed routes of new access tracks; and
 - Probes advanced on a grid at approximate 25m centres at the location of the proposed substation, the proposed construction compound and within each of the proposed borrow pit search areas.
- 10.34 Following completion of the Phase 2 survey, SEPA were consulted (by way of teams call where peat depth mapping was shared) to seek their feedback on the 'design chill' development layout and its potential impact upon peat. SEPA had a few concerns over a number of turbine locations in the vicinity of deep peat which were addressed by design iteration where possible given other constraints.

- 10.35 A third phase of peat probing (Phase 2b), using the probing patterns described above, was completed by RPS in December 2024 following subsequent amendments that were made to infrastructure locations.
- 10.36 Data obtained from the peat depth surveys were subsequently used to plot the presence and distribution of peat across the revised 'design chill' development layout, create a peat contour plan, and feed into detailed design iteration. The data was subsequently used to inform an outline Peat Slide Risk Assessment (PSRA) and development of an outline Peat Management Plan (PMP); refer to Technical Appendices 10.2 and 10.3, respectively.

Assessment of Significance

Sensitivity

- 10.37 The sensitivity characteristics of geological hydrological and hydrogeological resources have been guided by the matrix presented in Table 10.2, which lists indicative criteria.

Table 10.2: Sensitivity Criteria (Hydrology, Geology and Peat)

Sensitivity	Definition and Examples
High	Areas containing geological, geomorphological, or hydrological features considered to be of national interest, for example, Aquatic Natura 2000 sites, Special Areas of Conservation, Sites of Special Scientific Interest. Highly permeable superficial deposits allowing free transport of contaminants to groundwater and surrounding surface waters. Wetland/watercourse of High or Good Ecological Status. Raised or blanket bog. High risk of flooding.
Medium	Areas containing features of designated regional importance, for example, Regionally Important Geological and Geomorphological Sites (RIGS) considered worthy of protection for their educational, research, historic or aesthetic importance. Moderately permeable superficial deposits allowing some limited transport of contaminants to groundwater and surrounding surface waters. Wetland/watercourse of Moderate Ecological Status. Significant peat deposits. Moderate risk of flooding.
Low	Geological features not currently protected and not considered worthy of protection. Low permeability superficial deposits likely to inhibit the transport of contaminants. Wetland/watercourse of Poor or Bad Ecological Status or no WFD classification. Thin superficial peat deposits. Low risk of flooding.

- 10.38 The criteria for sensitivity have been developed based on a hierarchy of factors relating to quality of the aquatic and geological environment including international and national designations, water and soil quality information, waterbody status from the WFD review work undertaken to date by SEPA, consultations, site visits, and the professional judgement of the assessment team.

Magnitude

- 10.39 The prediction and assessment of the magnitude of effects on geology, hydrology, and hydrogeology has been undertaken using a series of tables to document the various potential impacts from aspects of the construction and operational phases of the Proposed Development. Impacts have been predicted based on the guidance criteria for the magnitude of change set out in Table 10.3. Impacts from aspects of decommissioning are considered to be the same as or lesser than those for construction.

Table 10.3: Magnitude of Effects Criteria (Hydrology, Geology and Peat)

Magnitude	Criteria
High	Total loss of, or alteration to key features of the baseline resource such that post development characteristics or quality would be fundamentally and irreversibly changed, for example, extensive excavation of peatland or watercourse realignment.
Medium	Loss of, or alteration to key features of the baseline resource such that post development characteristics or quality would be partially changed, for example, in-stream permanent bridge supports or partial excavation of peatland.
Low	Small changes to the baseline resource, which are detectable, but the underlying characteristics or quality of the baseline situation would be similar to pre-development conditions e.g. culverting of very small watercourses/drains and / or the excavation of thin deposits of peat.
Negligible	A very slight change from baseline conditions, which is barely distinguishable, and approximates to the 'no change' situation, for example short term compaction from machinery movements.

- 10.40 Using these criteria, potential effects resulting from the proposed development have been assessed. These effects are presented in paragraphs 10.104 – 10.133. Details of generic and site-specific mitigation measures are given in paragraphs 10.134 – 10.164, with the remaining residual effects detailed in paragraphs 10.166 – 10.176.

Significance of Effects

- 10.41 The significance of predicted effects has been assessed in relation to the sensitivities of the baseline resource. A matrix of significance, based on the combination of magnitude of change and sensitivity of receptor, has been developed to provide a consistent framework for evaluation. This is shown in Table 10.4 below.

Table 10.4: Significance of Effects Matrix

	Sensitivity			
Magnitude	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

- 10.42 The guideline criteria for the various categories of effect are provided in Table 10.5.

Table 10.5: Significance Criteria (Hydrology, Geology and Peat)

Significance	Definition	Guidance Criteria
<i>Major</i>	A fundamental change to the environment.	Loss of extensive areas of deep peat and / or geological resources. Changes in water quality or quantity affecting widespread catchments or groundwater reserves of strategic significance, or changes resulting in substantial loss of conservation value to geological or aquatic habitats and designations.
<i>Moderate</i>	A large, but non-fundamental change to the environment.	Loss of localised areas of deep peat and / or geological resources. Changes in water quality or quantity affecting part of a catchment or groundwaters of moderate vulnerability, or changes resulting in loss of conservation values to geological or aquatic habitats or designated areas.
<i>Minor</i>	A small but detectable change to the environment.	Localised changes resulting in minor and/or reversible effects on soils, surface and groundwater quality or habitats.
<i>Negligible</i>	No detectable change to the environment.	No effects on geological resources, drainage patterns, surface and groundwater quality or aquatic habitats.

- 10.43 In the above classification, fundamental changes are those which are permanent, either adverse or beneficial, and would result in widespread change to the baseline environment. For the purposes of this assessment, those effects identified as being major or moderate have been evaluated as significant environmental effects and, therefore, are those which may have an adverse effect on the status of waterbodies, watercourses, groundwater, or geological resources.
- 10.44 These matrices have been used to guide the assessment, though they have been applied with a degree of flexibility, since the evaluation of effects will always be subject to location-specific characteristics which must be taken into account. For this reason, the evaluation of the significance of effects in particular will not always correlate exactly with the cells in the relevant matrix, especially where professional judgement and knowledge of local conditions may result in a slightly different interpretation of the impact concerned.
- 10.45 Cumulative effects have been accounted for through the prediction and evaluation of effects at a catchment-wide level.

Requirements for Mitigation

- 10.46 Committed mitigation measures are presented within this chapter where the potential to affect sensitive geological, hydrological, or hydrogeological receptors has been predicted. These may include temporary effects from construction or permanent/longer-

term effects associated with the operational phase of the Proposed Development and its associated infrastructure.

Assessment of Residual Effect Significance

- 10.47 An assessment of any predicted significant residual effects on sensitive geological, hydrological, or hydrogeological receptors is presented within this chapter.

Limitations

- 10.48 No water quality monitoring or intrusive investigations, other than peat depth survey work as described in paragraphs 10.29 to 10.36, have been undertaken. This is not considered to represent a significant limitation to the assessment of effects, as detailed intrusive site investigation works and water quality monitoring would, as is typical, be undertaken prior to and during construction to inform detailed engineering design, micro-siting, and environmental protection and control measures to be implemented.

Baseline Conditions

Designated Sites

- 10.49 Reference to the NatureScot SiteLink map indicates that western and north-western parts of the 'study area' extend into part of the wider Caithness and Sutherland Peatlands Ramsar site and World Heritage Site (WHS). This site is also noted to be designated as a Special Area of Conservation (SAC) and a Special Protection Area (SPA). The boundaries of Ramsar site specifically follow the boundary of the Strath Duchally Site of Special Scientific Interest (SSSI). This site has been notified as it supports one of the largest and most intact areas of blanket bog in the world and a number of rare species of wetland plants and animals.
- 10.50 It should be noted that the smaller 'development area' does not encroach onto the adjacent Ramsar and WHS site and is confined to an area of commercial forestry that is located to the east of the Ramsar site boundary. As a result of this, no construction works are intended to be undertaken within or in the immediate proximity to the Ramsar site.
- 10.51 It is also noted that the proposed development area is located down topographical and hydraulic gradient of the Ramsar site, which will help to mitigate against any potential impacts from the development works.
- 10.52 In light of the proximity of the Caithness and Sutherland Peatlands Ramsar site, reference has been made to the Highland Council's toolkit – 'Flow Country Candidate World Heritage Impact Assessment Screening' and an initial screening exercise has been undertaken to assess the potential effects to its peatland ecosystem quality (criterion (ix)). On the basis of this initial screening, it is considered that the development works will not impact on the integrity of the Ramsar site as a whole.
- 10.53 The Cnoc an Alaskie SSSI, which is also noted to be part of the wider Caithness and Sutherland Peatlands Ramsar/SAC/SPA site is also located approximately 1.5km north-east

of the study area. Given its distance from the site this site is not considered to represent a concern.

Geology (including Soils)

- 10.54 BGS online mapping for the study area shows that the development site is underlain by metamorphic bedrock of the Altnaharra Psammite Formation which comprises psammite and micaceous psammite formed approximately 541 to 1,000 million years ago. This rock was originally sedimentary in origin, forming in shallow seas, and has subsequently undergone low grade metamorphic change.
- 10.55 The bedrock geology as shown on BGS 1:50,000 scale mapping is shown on Figure 10.2.
- 10.56 BGS mapping shows that bedrock across the site area is generally overlain by Till, Hummocky Glacial Deposits or Peat. The Till and Hummocky Glacial deposits are expected to comprise poorly sorted sand, gravel, cobbles, and boulders in a clay matrix. A localised area of Glaciofluvial Sheet Deposits (sand and gravel) is shown to be present in the northern part of the site. In addition, areas of Alluvium (sand and gravel) are shown to be located on the northern boundary, in the vicinity of Strath Duchally, and on the eastern boundary in the vicinity of the River Fiag. In the east, localised pockets of River Terrace Deposits are also shown to be present.
- 10.57 With respect to soil resources, reference to the National Soil Map of Scotland indicates that soils in eastern and far northern parts of the study area are classified as '*Peaty gleyed podzols with dystrophic semi-confined peat with peaty gleys.*' Soils in southern, central, and northern parts of the study area are classified as '*Peaty gleys with dystrophic blanket peat with peaty gleyed podzols.*' Soils in the north-western part of the study area (and within the designated Caithness and Sutherland Peatland) are classified as '*dystrophic blanket peat.*'
- 10.58 The superficial geology as shown on BGS 1:50,000 scale mapping is shown on Figure 10.1 and peat mapping for the site area is shown on Figure 10.3.

Peat

- 10.59 The NatureScot carbon and peatland mapping (2016) defines that the majority of the study area within the forested area comprise Class 5 peat, which is described as '*Peat soil*' where no peatland habitat/ vegetation has been recorded. These areas may include areas of bare soil, soils that are carbon-rich or deep peat.
- 10.60 Western and north-western parts of the study area (located out with the forested area but within the Caithness and Sutherland Peatland area) and a localised area in the central eastern part of the study area comprise Class 1 peat, which is described as '*Peat Soil*' that comprises nationally important carbon-rich soils, deep peat and priority peatland habitat that are likely to be of high conservation value.
- 10.61 In addition to the above thin strips located along the northern boundary (in the vicinity of Strath Duchally Burn) and along parts of the eastern boundary (in the vicinity of the River Fiag) comprise Class 2 peat. This is described as '*Peat soil with occasional peaty soil*' that

includes nationally important carbon-rich soils, deep peat and priority peatland habitat with potentially high conservation value and restoration potential.

- 10.62 Peat depth surveys were undertaken as described in paragraphs 10.29 to 10.36, in consultation with SEPA and guided by Guidance on Developments on Peatland - Site Surveys (2017) to identify and characterise peat deposits that may be present around proposed turbines and associated infrastructure.
- 10.63 The locations and findings of the peat probes are illustrated within Technical Appendix 10.2: Outline Peat Management Plan.
- 10.64 The Guidance on Developments on Peatland - Site Surveys (2017) uses the definition of peat, deep peat, and organo-mineral (peaty) soils which is presented in the Joint Nature Conservation Committee (JNCC) Report 445 Towards an Assessment of the State of UK Peatlands (2011). This definition, which has been used within this chapter, is summarised below:
- **Peaty (or organo-mineral) soil:** a soil with a surface organic layer less than 0.5 m deep;
 - **Peat:** a soil with a surface organic layer greater than 0.5 m deep which has an organic matter content of more than 60%;
 - **Deep peat:** a peat soil with a surface organic layer greater than 1.0 m deep.
- 10.65 In total 1093 peat probes were advanced across the development site with 374 probes in June 2024 (Phase 1), 622 probes in September 2024 (Phase 2) and 97 probes in December 2024 (Phase 2b). Contouring of the peat probe results from all stages of the work was subsequently undertaken to establish an estimation of the peat depths across the assessment site.
- 10.66 The peat probing undertaken has generally confirmed that the majority of infrastructure has avoided deep peat except a few small sections of track which are to be floated. The average depth of peat across the site is 0.65m. The maximum recorded peat depth was 3.9m.
- 10.67 Full details of the peat depth survey, together with an outline Peat Slide Risk Assessment, are provided in Technical Appendix 10.3. An outline Peat Management Plan is provided as Technical Appendix 10.2.
- 10.68 Overall, the sensitivity of the baseline geological resources at this site are considered to be medium, given the presence of peat across the site, although of variable thickness.

Hydrogeology

- 10.69 The groundwater body beneath the site is indicated by SEPA to comprise part of the Northern Highlands groundwater body. This groundwater body was classified by SEPA in 2021 as having an overall status of good.

- 10.70 Hydrogeology mapping data from the BGS shows that the bedrock beneath the main site area comprises a low productive aquifer in which flow is virtually all through fractures and other discontinuities.
- 10.71 Peat and peaty soils would be expected to contain perched groundwater but would also be expected to inhibit groundwater flow. Till deposits, where present, are anticipated to be of variable permeability, depending on the proportion of clays and silts relative to coarser components (sand, gravel, cobbles, and boulders).
- 10.72 Groundwater vulnerability mapping indicates that most of the site is classified as Class 4a or 4b. Class 4a/ 4b areas are those where groundwater would be vulnerable to pollutants that are not readily adsorbed or transformed. Superficial deposits within areas classified as 4a generally comprise low permeability soils but are less likely to include clay, whereas superficial deposits in areas classified as 4b are more likely to include clay.
- 10.73 Regional hydrogeology and vulnerability mapping for the site is shown on Figures 10.4 and 10.5.

Potential Groundwater Dependent Habitats

- 10.74 Several communities were assessed as being potentially dependent on groundwater within the survey area during National Vegetation Classification survey work undertaken at the site (see Chapter 8: Ecology and Figure 8.3 for further detail).
- 10.75 Of these, seven areas were considered to be groundwater dependent by the ecologists as a result of the vegetation types that were encountered and evidence of groundwater arising from springheads or percolating through the ground. These areas comprised M10 (*Carex dioica* – *Pinguicula vulgaris* mire) and M32 (*Philonotis fontana*-*Saxifraga stellaris* spring) communities. All seven of these areas are noted to be out with the development site boundary but within the 250m survey buffer zone. It is also likely that these buffers will be reduced to 100m in some areas as excavations will be less than <1.0m.
- 10.76 Four individual M32 community areas are situated approximately 250m north-west of the development site boundary and within the Caithness and Sutherland Peatland area. The closest area is situated approximately 500m from the nearest turbine base (T1) and its associated infrastructure. Given their distance from the proposed infrastructure (i.e. >250m), it is considered that these GWDTE's are unlikely to be impacted by the proposed development.
- 10.77 Three individual M10 community areas are situated approximately 250m east of the development site boundary and to the east of the River Fiag. The closest area is situated approximately 300m from the nearest turbine base (T20) and its associated infrastructure. These GWDTE's are considered likely to be isolated from impacts from within the site boundary due to their distance from the nearest proposed turbine / infrastructure feature (i.e. >250m) and because of the buffering effects of the River Fiag, which flows along the development site boundary between the GWDTE areas and the proposed infrastructure.
- 10.78 Based on the above, it is considered that the GWDTE's that have been identified are unlikely to be affected by the proposed development. As such, GWDTE's are not considered further within this chapter.

Private Water Supplies

- 10.79 The Highland Council were consulted about the presence of Private Water Supplies (PWS) located in the vicinity of the proposed turbines and associated infrastructure. Records for four PWS located within 4.0km of the site have been provided.

Table 10.6: Summary of PWS Located in the Vicinity of the Site

Unique ID	Site Name	Class	Co-ordinates	Source Type
44517	Carrachan	B – Domestic Supply	242224, 922724	Surface Watercourse
31118	Overscaig Hotel	B – Domestic Supply	241 672; 923254	Borehole
46486	Overscaig Cottage	B – Game Larder	241 547; 923507	Stream
44466	Oak Lodge	B – Domestic Supply	241 624; 923571	Surface Watercourse

- 10.80 All PWS records are shown to be located to the west of the development site and on the north-eastern shore of Loch Shin. The closest of these is PWS Carrachan, which is located approximately 3.1km west of the nearest proposed infrastructure (T8). The PWS at Overscaig Hotel is located approximately 3.5km west of the nearest proposed infrastructure and the PWS at Overscaig Cottage and Oak Lodge are both situated approximately 3.7km west of the nearest proposed infrastructure. Given their distance from the proposed infrastructure, these PWS abstractions are considered unlikely to be impacted by the proposed development.
- 10.81 No wells, springs or other features suggesting the potential presence of a PWS have been identified from a review of OS mapping, within the site boundary or within 2km of any proposed turbines or other new infrastructure. In addition, no evidence of potential PWS were observed on site during the course of the site survey work.
- 10.82 A map highlighting the location of the PWS record described above are presented on Figure 10.7.
- 10.83 An assessment of effects on PWS is not considered further within this chapter.

Summary of Groundwater Sensitivity

- 10.84 Taking account of the low productivity aquifer underlying the site, the generally low permeability superficial deposits, the location of potential GWDTE's and the absence of PWS in the study area, the sensitivity of baseline hydrogeological resources beneath this site is considered to be low.

Watercourses

- 10.85 As shown on Figure 10.6, no named watercourses are present within the study area. The River Fiag, which flows in a southerly direction partially forms the site's eastern boundary. A number of unnamed tributaries of the River Fiag are located on site. These are noted to generally flow in an easterly direction before discharging into the River Fiag. The River Fiag

ultimately drains into Loch Shin which lies adjacent to the sites southern boundary. The Strath Duchally Burn also forms the sites northern boundary. This watercourse flows in an easterly direction until it meets the River Fiag in the north-eastern corner of the site.

- 10.86 Both the River Fiag and the Strath Duchally Burn were classified by SEPA in 2023 as being in Poor condition.
- 10.87 For the purposes of this assessment and taking account of the Poor status of the local watercourses, the sensitivity of baseline hydrological resources at this site is considered to be low.
- 10.88 The hydrological features described above are highlighted on Figure 10.6.

Water Crossings

- 10.89 The road and tracks providing access to the turbines and other infrastructure will require to cross watercourses at a number of locations. In total, two new water crossings will be required, and eight existing watercourse crossing will require to be upgraded. The proposed new and upgraded crossings are briefly outlined below, with further details provided in the outline water crossing schedule, Technical Appendix 10.1.
- NWC1 is a new crossing of an unnamed tributary of the River Fiag on a short new section of the main access track in the south-western part of the site. An oversized bottomless arched culvert watercourse crossing will be formed at this new track crossing point.
 - NWC2 is a new crossing of an unnamed tributary of the River Fiag on the proposed T15 access spur. An oversized bottomless arched culvert watercourse crossing will be formed at this new track crossing point.
 - EWC1 is an existing crossing of an unnamed tributary of the River Fiag on the existing main access track in the south-western part of the site. A new oversized bottomless arched culvert watercourse crossing will be formed at this track crossing point.
 - EWC2 and EWC3 are existing crossings of two unnamed tributaries of the River Fiag located on the existing main access track in the central part of the site and between the proposed access spurs for T11 and T6/T8. New oversized bottomless arched culvert watercourse crossings will be formed at these track crossing points.
 - EWC4 is an existing crossing of an unnamed tributary of the River Fiag on the existing main access track in the central part of the site and between the proposed access spurs for T6/T8 and T9. A new oversized bottomless arched culvert watercourse crossing will be formed at this track crossing point.
 - EWC5, EWC6 and EWC7 are existing crossings of three unnamed tributaries of the River Fiag located on the existing main access track in the northern part of the site and between the proposed access spurs for T1 and T4. New oversized bottomless arched culvert watercourse crossings will be formed at these track crossing points.
 - EWC8 is an existing crossing of an unnamed tributary of the River Fiag on the existing main access track in the northern part of the site and to the north of the proposed access spurs for T4. A new oversized bottomless arched culvert watercourse crossing will be formed at this track crossing point.

10.90 The locations of the existing and proposed water crossings are shown in Figure 3.1.

Borrow Pit Search Areas

10.91 As shown on Figure 3.1, three borrow pit search areas have been identified:

10.92 The northern borrow pit search area is located immediately to the south of the proposed main access track that leads to T1 in the north-western part of the site. This is considered likely to be a suitable location for providing stone for access track construction in northern parts of the site.

10.93 The central borrow pit search area is located immediately to the west of the existing access track in between the T11 access track turning head to the north and the T13 access track turning head to the south. This is considered likely to be a suitable location for providing stone for access track construction across central parts of the site.

10.94 The southern borrow pit search area is located immediately to the north of the existing access track in between the T15 access track turning head to the east and the T12 access track turning head to the west. This is considered likely to be a suitable location for providing stone for access track construction in the southern part of the site.

10.95 The bedrock geology in each of the borrow pit search areas is reported to comprise psammite and micaceous psammite of the Altnaharra Psammite Formation. As set out in Chapter 3: Project Description, intrusive site investigation work will be undertaken at each borrow pit search area to further characterise the rock, identify its suitability, and allow a specific excavation location or locations within the search areas to be confirmed prior to commencement.

10.96 Following excavation, the borrow pit area(s) will be restored using site-won soils and peat in accordance with relevant good practice guidance. Further information on the use of excavated peat for restoration of borrow pits is given in Technical Appendix 10.2 Outline Peat Management Plan.

Flooding

10.97 The online SEPA Indicative River & Coastal Flood Map illustrating the areas where there is a 0.1% or greater probability of being flooded in any given year, i.e. the 1:200-year flooding event, in the vicinity of the site has been reviewed.

10.98 This map indicates that areas of fluvial flood risk (flooding from rivers) are confined to isolated tributary channels and in the immediate vicinity of the River Fiag on the western site boundary and the Strath Duchally Burn on the northern site boundary.

10.99 This map identifies very limited, localised areas with a risk of surface water flooding, all confined to the surface water features that are located on site and areas of forestry.

10.100 With the only flood risk being associated directly adjacent to the onsite watercourses, remote from any proposed infrastructure, the risk of flooding on the site, and the sensitivity of the site to flooding, is considered to be low.

Contaminated Land

- 10.101 Historically, the main body of the Site is shown to have largely comprised undeveloped moorland, with historical maps from the mid-1800s to 1955 showing no development onsite with the exception of a disused quarry and two small gravel pits that are situated on the southern site boundary and to the west of the site entrance. These features are shown to be present from circa 1963. The area of the disused quarry currently remains visible, but the locations of the gravel pits are less evident and may have been infilled / covered by vegetation.
- 10.102 No further potential sources of contamination are shown to be present on-site on the available historical maps. More recent development is noted to have taken place on site with the construction of an access track through the site. The development of this track is considered to be associated with the current use of the site for commercial forestry activities. These features are not considered to represent a significant source of contamination.
- 10.103 With no potentially significant contamination sources identified within the main body of the site, contaminated land will not be considered further within this assessment.

Identification and Evaluation of Key Effects

- 10.104 The potential effects resulting from the proposed development are detailed below. Effects have been separated into those which occur during the construction, operation, and decommissioning phases individually.

Construction Effects

- 10.105 The construction phase includes all activities prior to the operation of the proposed development, i.e. up to the point at which the turbines begin generating electricity. The following paragraphs outline the potential effects identified, with respect to geology, hydrology, and hydrogeology during this phase.

Impact upon Designated Sites

- 10.106 The Flow Country WHS and Caithness and Sutherland Peatlands Ramsar site is located beyond the western and north-western boundaries of the development area. Although construction works will be confined to commercial forestry areas and not within or in proximity to the Ramsar site boundary, there is a potential for indirect impacts to be realised if mitigation measures are not put in place. It is considered that these are likely to be limited to impacts on groundwater quality and flow. However, it should be noted that the development site is located down topographical and hydraulic gradient of the Ramsar site. As such, it is considered that groundwater is likely to drain away from the Ramsar site towards the River Fiag, which will limit impacts that may occur to underlying groundwater.
- 10.107 The magnitude of change, prior to mitigation, is considered to be low, on a high sensitivity receptor. Therefore, there is potential for a direct, temporary, short-term effect of **moderate adverse** significance prior to implementation of mitigation measures.

Pollution Impact from Sediment Run-off / Transport and / or Chemical Contaminated Run-off

- 10.108 Surface run-off containing silt and other sediments, particularly during and after rainfall events, has the potential to enter the watercourses and drains that are present on-site. Silt and sediment laden surface water run-off is predicted to arise from excavations, exposed ground, and any temporary stockpiles.
- 10.109 Silt and sediment laden run-off has the potential to impact on the water quality and hydrological and ecological function of receiving watercourses at and downstream of the works in the absence of any mitigation.
- 10.110 Additionally, pollutants such as oils, fuel and cement may be mobilised through mechanical leaks or spillage and carried in surface drainage. Unless managed appropriately, these pollutants could be washed into watercourses, impacting on freshwater quality and ecological value.
- 10.111 The magnitude of change, prior to mitigation, is considered to be medium, on a low sensitivity receptor. Therefore, there is potential for a direct, temporary, short-term effect of **minor adverse** significance prior to implementation of mitigation measures on watercourses and other surface water features.

Pollution Impact from Forestry Felling

- 10.112 On-site forestry will be felled where required to construct site infrastructure, in line with a Wind Farm Forest Plan, (refer to Chapter 14: Forestry). Removal of mature trees may lead to direct impacts on the water environment through forestry material and brash entering local watercourses, and loss of structure of the underlying soils, with increased risk of erosion.
- 10.113 In the absence of mitigation, the magnitude of change is potentially high, on a low sensitivity receptor. Therefore, there is potential for a direct, temporary, medium-term effect of **moderate adverse** significance prior to the implementation of mitigation measures.

Changes to Groundwater Flow

- 10.114 As discussed within the baseline, there is anticipated to be little groundwater at shallow depth beneath the site. It is considered that any shallow groundwater will be limited to perched groundwater within peat deposits, and localised areas of till containing higher proportions of sand and gravel content. Groundwater within the bedrock is anticipated to be minimal, with flow restricted to fissures and other discontinuities.
- 10.115 Excavations will be required to form turbine foundations and borrow pit workings, and shallower excavations will be required to form platforms for the substation and the temporary construction compound. However, given the anticipated absence of substantial groundwater within the superficial deposits, any changes to groundwater flow would be highly localised.

10.116 There is therefore a potential low magnitude impact on a low sensitivity receptor, resulting in a direct, temporary, short-term effect of **negligible adverse** significance in the absence of mitigation.

Removal of and Impact on Peat

10.117 Variable thicknesses of peat have been identified across the site. Extensive design iteration work has been undertaken, seeking to avoid siting infrastructure on areas of deep (>1.0m) peat wherever possible, while taking account of other environmental and physical constraints (refer to Chapter 4: Design Evolution). This has resulted in the following:

- Twelve of the fifteen turbines are sited on 'peaty soil' rather than peat, i.e. peat depth less than 0.5 m thick.
- The remaining three (T1, T2, and T15) of the fifteen turbines are sited on peat recorded at depths between 0.5 m and 1.0 m, therefore defined as peat, but not deep peat. Following detailed pre-construction site investigations, there may be an opportunity to micro-site the turbines in order to reduce the volume of peat requiring excavation.
- All other infrastructure elements (construction compound, substation and borrow pit search areas) are sited on areas with an average peat depth less than 1.0 m.
- Proposed new track/turning head sections are generally sited on areas where peat depth is less than 1.0m. Thicker peat deposits have been identified in the central and southern area of the site, particularly north of T7, although care has been taken to avoid the deepest areas of peat to the north-east of the track in this area. Some thicker peat deposits have also been recorded to the north of T2, the north and west of T13 and to the north and south of T15. The requirement for peat excavation at these locations will be minimised, via the construction of floating road, where required.

10.118 It is clear that there will be a requirement for excavation of some peat to allow construction of turbine foundations, hardstandings, new track, and other infrastructure elements. Further detail on the estimated volume of peat to be excavated, and the management of excavated peat, is given in Technical Appendix 8.2.

10.119 In the absence of mitigation, there is a potential medium magnitude impact on a high sensitivity receptor, resulting in a direct, permanent effect of **major adverse** significance.

Peat Landslide Impact on Watercourses

10.120 Construction on peat soils, and associated activities, can result in destabilisation of peat deposits on slopes and lead to slope failure, with subsequent potential for peat and soils to reach watercourses downslope and cause pollution/sedimentation and changes to fluvial geomorphology. A detailed assessment of peat landslide risk has been undertaken as presented in Technical Appendix 10.3. This has identified low peat landslide risk at all proposed turbine, hardstanding, and other infrastructure locations.

10.121 It should be noted that proposed turbines and hardstandings would not be constructed on peat, rather any peat within the footprints of turbines and hardstandings would be excavated to allow construction on a suitable founding stratum (i.e. bedrock).

- 10.122 In the absence of mitigation, the overall potential magnitude of impact from peat landslide resulting from construction activities at the site is assessed as low, on a low sensitivity receptor, resulting in a direct, temporary, short-term effect of **negligible adverse** significance.

Impact on the Integrity of Banking

- 10.123 Construction activities on or close to the sides of watercourses can detrimentally affect the structural integrity of burn banks, either through direct damage to bankside material or indirect loosening of soil structure thus impacting on the localised morphology and water quality of the watercourse through erosion or even collapse of the banking.
- 10.124 Permanent new watercourse crossings will be required at two locations with eight additional existing watercourse crossing requiring upgrading. Subject to detailed pre-construction site investigation works, it is anticipated that these new and upgraded crossings will comprise installation of oversized bottomless arched culverts. Further details are provided in EIAR Volume 4, Appendix 10.1 Outline Watercourse Crossing Schedule whilst EIAR Volume 2, Figure 3.5 depicts a typical watercourse crossing.
- 10.125 There is potential for a high magnitude impact on low sensitivity receptors, therefore, there is potential for a direct, permanent effect of **moderate adverse** significance prior to the implementation of mitigation measures.

Direct Discharge of Untreated Foul Drainage

- 10.126 Unless appropriately sited and managed, there is potential for direct discharge of untreated foul sewage from welfare facilities from site compounds during construction.
- 10.127 The magnitude of change, prior to mitigation, is medium on a low sensitivity receptor. Therefore, there is likely to be a direct, temporary, medium-term effect of **minor adverse** significance on watercourses prior to the implementation of mitigation measures.

Operational Effects

Surface Water Drainage

- 10.128 The access track and crane hardstandings for the wind turbines, and any un-restored areas may result in an increased rate of surface water run-off from the site, increasing downstream flood risk and potentially resulting in soil erosion and silt-laden run-off, which could pollute downstream watercourses, ditches, and lochs.
- 10.129 The magnitude of change, prior to mitigation, is high, on a low sensitivity receptor. Therefore, there is potential for a direct, long-term effect of **moderate adverse** significance prior to the implementation of mitigation measures.

Fluvial Geomorphology

- 10.130 If watercourse crossings are not designed properly to ensure continuous flows, this could potentially adversely affect the geomorphology of the streams by reducing heterogeneity.

- 10.131 The magnitude of change, prior to mitigation, is medium, on a low sensitivity receptor. Therefore, there is potential for a direct, permanent effect of **minor adverse** significance prior to the implementation of mitigation measures.

Decommissioning Effects

- 10.132 Potential effects of decommissioning the proposed development are similar to those encountered in the construction phase, however, generally with less magnitude as the level of site activity is lower.
- 10.133 Discussions will be held with The Highland Council and the appropriate Regulatory Authorities prior to decommissioning to agree an appropriate Decommissioning Strategy.

Mitigation Measures and Monitoring

Project Design

- 10.134 The following considerations have been taken into account in the iterative design of the proposed development (note that full details of the project design are provided in Chapter 3: Project Description and the iterative design process is set out in Chapter 4: Design Evolution):
- Maintaining a 50m buffer around all surface watercourses, except where watercourse crossings are required;
 - Avoiding the placement of turbines in peat greater than 1m in depth;
 - Application of appropriate buffers (250m) around identified GWDTE; and
 - Avoidance of high-quality peatland
- 10.135 Rigorous construction environmental management procedures will be implemented in line with a Construction Environmental Management Plan (CEMP) to ensure appropriate protection of the above-noted watercourses, and all other surface water receptors.
- 10.136 Areas of deep peat have been avoided in the siting of all turbines and hardstanding areas. Some sections of new access track situated in the eastern part of the site, particularly in the areas of T2, T7, T13 and T15 are sited in areas where peat has been recorded at thicknesses in excess of 1.0m, although care has been made to avoid the thickest peat deposits. It is proposed that floated access tracks will be placed where peat exceeds 1.0m in depth.
- 10.137 No infrastructure is proposed to be constructed in or near areas of medium or high peat landslide risk. Further detailed investigation will be undertaken pre-construction (see below), to clarify the risks and confirm mitigation or micro-siting to address any risks higher than negligible, as appropriate.

Pre-Construction Site Investigations

- 10.138 To determine ground and groundwater conditions across the site, pre-construction site investigations will be conducted. These investigations will focus on areas where

construction is proposed to be undertaken and will allow the turbines and the associated infrastructure to be micro-sited away from any areas considered to be unsuitable, such as areas of contamination (unlikely), areas of deeper peat wherever possible, or where there are significant groundwater flows.

- 10.139 The investigations will also include targeted monitoring and assessment of the groundwater levels and flows beneath the site. This will allow for micro-siting and to assist in the detailed design of infrastructure and selection of appropriate materials for use during the construction process. It will also assist with assessing any potential risks to the adjacent Caithness and Sutherland Peatlands Ramsar site in terms of groundwater flow and quality. Investigations within the borrow pit search areas will allow appropriate selection of specific extraction areas, to avoid or minimise any adverse effects associated with quarrying activities.

Construction

Peat

- 10.140 The pre-construction site investigations noted above, and observations during construction, will inform micro-siting, if required and appropriate, to minimise peat slide risk and the volume of peat to be extracted as far as possible.
- 10.141 The borrow pit search areas represent relatively broad zones, within which only a proportion will be excavated to win stone for the site's construction. No excavation will occur until further site investigations have been undertaken to assess the suitability of the areas and refine the assessment of peat slide risk. For example, areas of deeper peat, if found to be present within the search areas would be avoided, thereby reducing the peat slide risk. If it is determined that no suitable excavation site within any given search area can be identified, then no excavation will occur at that search area.
- 10.142 If it is not possible to avoid routing tracks over localised areas of deep peat, as is the case for stretches of track that are proposed to be constructed in eastern parts of the site, particularly in the areas of T2, T7, T2, T13 and T15, these would be floated to avoid the requirement for excavation of peat. This would involve the placing of a geotextile membrane on existing topsoil and vegetation followed by aggregate layers. Floating roads would be designed to ensure suitability for site traffic during construction and operation as per the NatureScot guidance document Good Practice During Wind Farm Construction, 2019.
- 10.143 Any peat excavated will be re-used on site as set out in the Outline Peat Management Plan (EIA Volume 4, Technical Appendix 10.2).

Water Quality

- 10.144 The appointed Contractor will undertake pre-construction baseline water quality sampling and analysis of the principal surface water receptors River Fiag, Strath Duchally Burn and Loch Shin and selected monitoring points within the adjacent Caithness and Sutherland Peatlands Ramsar site. The Contractor will implement a programme of monthly monitoring and analysis of the water quality of these watercourses / features during the construction

period to ensure that they are not being impacted by the construction works. The full scope of monitoring will be detailed within the CEMP.

Pollution Impact from Sediment Run-off / Transport and / or Chemical Contaminated Run-off

10.145 With specific reference to the SEPA guidance document 'Guidelines for Water Pollution Prevention from Civil Engineering Contracts, Special Requirements,' the Contractor will produce a CEMP prior to the commencement of construction activities which contains a construction method statement that includes:

- A detailed breakdown of the phasing of construction activities;
- A pollution risk assessment of the site and the proposed activities;
- Identification of all water environment receptors that may be affected by the works and temporary discharge points to these watercourses;
- Monitoring of water quality within all water environment receptors that may be affected by the works;
- Planning and design of appropriate pollution control measures during earthworks and construction;
- Management of the pollution control system, including dewatering of excavations (if required) away from watercourses;
- Contingency planning and emergency procedures; and
- On-going monitoring of construction procedures to ensure management of risk is maintained.

10.146 All earthmoving works or similar operations will be carried out in accordance with BSI Code of Practice for Earth Works BS6031:1981.

10.147 All watercourse crossings and site discharges will be regulated under the CAR licensing regime and all necessary licences will be sought from SEPA prior to the commencement of any operations on site.

10.148 While it is acknowledged that best practice to minimise run-off would be to undertake construction and dismantling during the driest period of the year, given the location of the proposed development site, there are likely to be significant periods of rainfall throughout the year. Therefore, site management will check the local weather forecast daily and prime all site staff to ensure that everyone is aware of their responsibilities to maintain the pollution control system during wet weather or suspend sensitive operations during adverse weather conditions.

10.149 All fuel and other chemicals will be stored in accordance with best practice procedures, including being kept within a designated fuelling site located at a safe distance from existing watercourses and in appropriate impermeable bunded containers/areas, which will be defined within the outline CEMP. These will be designed to capture any leakage, whether from a tank or from associated equipment such as filling and off-take points, sightling gauges etc., all of which will be located within the bunded area.

- 10.150 Oil booms and soakage pads will be maintained in all work areas and spill kits kept in all vehicles to enable a rapid and effective response to any accidental spillage or discharge. All construction staff will be trained in the effective use of this equipment.
- 10.151 Construction vehicles and plant will be regularly maintained and all maintenance, fuelling and vehicle washing will be undertaken on appropriate impermeable surfaces away from watercourses to minimise risks of leaks to soil and surface waters.
- 10.152 Concrete batching will be undertaken in a designated area within a temporary construction compound. The Contractor will develop a method statement to address the on-site batching of concrete and the transport, transfer, handling and pouring of liquid concrete at foundations. It is likely that water will require to be abstracted to facilitate any on-site batching processes. A separate CAR licence application for any water abstractions required will be made to SEPA at the appropriate point prior to the commencement of construction.
- 10.153 Cement, grout, and unset concrete will not be allowed to enter the water environment. No operations involving concrete transfer between vehicles or into vehicles will take place within 30m of watercourses and water bodies.
- 10.154 Any vehicles used for delivery of concrete will only be washed out at locations to be agreed with SEPA. Excess concrete or wash-out liquid will not be discharged to drains or watercourses on site or at compounds. Drainage from washout facilities will be collected and treated or removed to an appropriate treatment point / licensed disposal site.
- 10.155 Where topography dictates that working platforms are needed, these will be formed to ensure that surface water drains away from watercourses.
- 10.156 The requirement for dewatering will be minimised in all locations by timely and efficient excavation of the foundation void and subsequent concrete pouring and backfilling.

Impact on Integrity of Banking

- 10.157 During the construction phase, construction staff will be instructed to maintain a sufficient distance from the watercourses located on site to ensure there is no incursion towards them.
- 10.158 Water crossing designs will follow best practice to prevent impact on the integrity of the banking of watercourses. Detailed design will be included within a Construction Method Statement to be agreed with The Highland Council and SEPA and detailed watercourse crossing designs will be regulated under the CAR licensing regime.

Direct Discharge of Untreated Foul Drainage

- 10.159 Welfare facilities will either connect directly to self-contained storage tanks or to a septic tank, subject to approval from SEPA.
- 10.160 If self-contained or septic tanks are to be used, these will be maintained and emptied on a regular basis by a suitably licensed contractor.

Operation

Surface Water Drainage

- 10.161 The proposed track and hardstanding design principles for the Proposed Development are presented in Chapter 3: Project Description.
- 10.162 Prior to construction, a detailed Drainage Strategy (DS) will be developed and agreed with SEPA and The Highland Council. The DS will detail the site drainage design, including the type of surface to be used for new access tracks, the soft engineering and habitat enhancement measures proposed to slow surface water flows and any necessary ponds, swales, cross drains, and bunds, to ensure that run-off from hard surfaces will be controlled. The DS will also detail the dimensions and final design of proposed watercourse crossings which will be designed to maintain continuous flows.

Fluvial Geomorphology

- 10.163 The detailed design for the watercourse crossings, and the requirements for CAR authorisations or licences, will be agreed with SEPA prior to construction in order to ensure that any potential impacts are minimised.

Decommissioning

- 10.164 Potential effects of decommissioning the Proposed Development are similar to those encountered in the construction phase, however, generally with less magnitude as the level of site activity is lower.

Residual Effects

Construction

Impact upon Designated Site's

- 10.165 The committed mitigation measures, including monitoring of watercourses including those present within the Ramsar site, implementation of a suitable CEMP and a surface water monitoring programme during construction, are considered to reduce the magnitude of impact from low to negligible, resulting in a direct, temporary, short-term residual **minor adverse** effect and not significant in EIA terms.

Pollution Impact from Sediment Run-off / Transport and / or Chemical Contaminated Run-off

- 10.166 The committed mitigation measures, including buffering of watercourses, implementation of a suitable CEMP and a surface water monitoring programme during construction, are considered to reduce the magnitude of impact from medium to negligible, resulting in a direct, temporary, short-term residual **negligible adverse** effect and not significant in EIA terms.

Pollution Impact from Forestry Felling

- 10.167 The committed mitigation measures, including implementation of a suitable CEMP, following best practice felling practices, and a surface water monitoring programme during construction, are considered to reduce the magnitude of impact from high to low resulting in a direct, temporary, medium-term residual effect of **negligible adverse** significance.

Changes to Groundwater Flow

- 10.168 The committed mitigation measures, including pre-construction site investigations to inform detailed foundation and infrastructure design and micro-siting, are considered to reduce the magnitude of impact from low to negligible, resulting in a direct, temporary, short-term residual effect of **negligible** significance.

Removal of and Impact on Peat

- 10.169 The committed mitigation measures, including design iteration to avoid deep peat wherever possible (and floating tracks where not possible to avoid), implementation of a Peat Management Plan, and Habitat Management Plan to restore peatland habitat, are considered to reduce the magnitude of impact from medium to negligible, resulting in a direct, permanent residual **minor adverse** effect and not significant in EIA terms.

Peat Landslide Impact on Watercourses

- 10.170 The committed mitigation measures, including pre-construction site investigations to inform detailed infrastructure design, micro-siting, and appropriate geotechnical controls, are considered to reduce the magnitude of impact from low to negligible, resulting in a direct, temporary, short-term residual **minor adverse** effect and not significant in EIA terms.

Impact on the Integrity of Banking

- 10.171 The committed mitigation measures, including appropriate water crossing designs regulated by CAR and agreed with SEPA and The Highland Council and the implementation of a suitable CEMP, are considered to reduce the magnitude of impact from high to negligible, resulting in a direct, permanent residual **negligible adverse** effect and not significant in EIA terms.

Direct Discharge of Untreated Foul Drainage

- 10.172 The committed mitigation measures, including appropriate management of foul drainage to be agreed with SEPA, are considered to reduce the magnitude of impact from medium to negligible, resulting in a direct, temporary, medium-term residual **negligible adverse** effect and not significant in EIA terms.

Operation

Surface Water Drainage

- 10.173 The committed mitigation measures, including implementing a suitable detailed Drainage Strategy in agreement with SEPA and The Highland Council, are considered to reduce the magnitude of impact from high to negligible, resulting in a direct, long-term effect of **negligible adverse** significance and is therefore not significant in EIA terms.

Fluvial Geomorphology

- 10.174 The committed mitigation measures, including appropriate water crossing designs regulated by CAR and agreed with SEPA and The Highland Council, are considered to reduce the magnitude of impact from medium to negligible, resulting in a direct, permanent residual effect of **negligible adverse** significance and is therefore not significant in EIA terms.

Decommissioning

- 10.175 Residual effects of decommissioning the Proposed Development are similar to those encountered in the construction phase, however, generally with less magnitude as the level of site activity is lower.

Cumulative Effects

- 10.176 This assessment has concluded that there will be no significant effects on geological resources associated with the proposed development. As such, no significant cumulative effects on geological resources associated with the proposed development, in combination with other similar local developments currently operational, consented or in planning, are predicted.
- 10.177 In terms of hydrology and hydrogeology, no operational and / or proposed wind energy projects are located within the catchments of the watercourses that flow through or in proximity to the proposed development area. As such, it is considered that the combined effect on hydrology will be minor and no additional mitigation measures over and above those committed to in this chapter are considered necessary to address potential cumulative effects on hydrology or hydrogeology.

Summary

- 10.178 Western and north-western parts of the 'study area' are noted to extend into part of the wider Caithness and Sutherland Peatlands Ramsar site. It should be noted that the smaller 'development area' does not encroach onto the Ramsar site and is confined to an area of commercial forestry that is located to the east of the Ramsar site boundary. As a result of this, no construction works are intended to be undertaken on or within 100m of the Ramsar site.

- 10.179 It is also noted that the proposed development area is located down topographical and hydraulic gradient of the Ramsar site, which will help to mitigate against any potential impacts from the development works.
- 10.180 No named watercourses are present within the study area. The River Fiag, which flows in a southerly direction partially forms the site's eastern boundary. A number of unnamed tributaries of the River Fiag are located on site. These are noted to generally flow in an easterly direction before discharging into the River Fiag. The River Fiag ultimately drains into Loch Shin which lies adjacent to the site's southern boundary. The Strath Duchally Burn also forms the sites northern boundary. This watercourse flows in an easterly direction until it meets the River Fiag in the north-eastern corner of the site.
- 10.181 Both the River Fiag and the Strath Duchally Burn were classified by SEPA in 2023 as being in Poor condition.
- 10.182 The rock beneath the site comprises metamorphic rock of the Altnaharra Psammite Formation. The bedrock is classified as a low productivity aquifer. Superficial deposits largely comprise Till Hummocky Glacial Deposits and peat. Localised areas of Glaciofluvial Sheet Deposits are shown to be present in the northern part of the site, while areas of Alluvium are shown to be located on the northern boundary, in the vicinity of Strath Duchally, and on the eastern boundary in the vicinity of the River Fiag. Localised pockets of River Terrace Deposits are also shown to be present in the eastern part of the site.
- 10.183 Detailed peat surveys identified variable thicknesses of peat across the site, with deep peat (>1.0m) generally limited to eastern, and northern areas of the site. A maximum recorded peat depth of 3.9m was recorded in the eastern part of the site.
- 10.184 Extensive design iteration works were undertaken to avoid siting turbines or other infrastructure on deep peat. This has resulted in areas of deep peat being avoided in the siting of all turbine / hardstanding areas. Proposed new track sections are generally sited on areas where peat depth is less than 1.0 m. Thicker peat deposits have been identified in the eastern parts of the site, particularly north of T7, although care has been taken to avoid the deepest areas of peat to the north-east of the track in this area. Some thicker peat deposits have also been recorded to the north of T2, to the north and west of T13 and to the north and south of T15. Again, care has been taken to avoid the deepest areas of peat in these areas. The requirement for peat excavation at these locations will be minimised, via the construction of floating road, where required.
- 10.185 A peat slide risk assessment has identified low risks at all turbine and other infrastructure locations.
- 10.186 Potential construction and operational effects include changes to the groundwater flow regime, the risk of pollution of watercourses resulting in adverse effects on water quality, excavation of peat, peat slide risk, and effects on the integrity of watercourse banks.
- 10.187 The mitigation measures set out in this chapter will be drawn together into a Construction Environmental Management Plan prior to the commencement of construction activities. These mitigation measures are considered to be robust and implementable and will reduce the potential impacts on peat resources and watercourses which have been

identified as medium / high to negligible. As such, the significance of residual effects on geology, surface water and groundwater, following the implementation of these mitigation measures, is considered to be **minor** or **negligible** and therefore **not significant**. Potential effects, mitigation measures and residual effects are summarised in Tables 10.7 and 10.8.

Table 10.7: Construction Summary Table

Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial / Adverse		Significance	Beneficial / Adverse
Impacts on designated sites	Moderate	Adverse	Avoidance of works on or within 250m of the Caithness and Sutherland Peatland Ramsar site. Avoidance of deep peat. 50 m buffer around watercourses wherever possible. Water quality monitoring. CEMP and construction site management.	Minor	Adverse
Pollution from sediment run-off and/or chemical contaminated run-off	Minor	Adverse	50 m buffer around watercourses wherever possible. Water quality monitoring. CEMP and construction site management.	Negligible	Adverse
Pollution from forestry felling	Moderate	Adverse	Key-hole felling and re-planting. Felling works in accordance with standard good forestry practice. Buffering of watercourses, management of riparian zone vegetation, drainage plan, brash control in watercourses and buffer areas, removing any accidental blockages, minimising soil damage.	Negligible	Adverse
Removal of and impact on peat	Major	Adverse	Pre-construction site investigation. Avoidance of deep peat. Construction of floating roads where required in areas containing peat deposits >1.0m.	Negligible	Adverse

Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial / Adverse		Significance	Beneficial / Adverse
			Micro-siting infrastructure where required and appropriate if unexpected deeper peat is identified. Implementation of Peat Management Plan. Implementation of Habitat Management Plan.		
Peat landslide impact on watercourses	Moderate	Adverse	Pre-construction site investigation to inform detailed design and geotechnical control measures. Avoidance of deep peat. Micro-siting infrastructure where required and appropriate.	Negligible	Adverse
Loss of bank integrity	Moderate	Adverse	Suitable water crossing design, regulated by CAR. CEMP and construction site management.	Negligible	Adverse
Pollution from foul drainage	Minor	Adverse	50 m buffer around watercourses wherever possible. Water quality monitoring. CEMP and construction site management. Suitable foul drainage management in agreement with SEPA.	Negligible	Adverse

Table 10.8: Operation Summary Table

Description of Effect	Significance of Potential Effect		Mitigation Measure	Significance of Residual Effect	
	Significance	Beneficial / Adverse		Significance	Beneficial / Adverse
Surface water drainage including downstream flood risk	Moderate	Adverse	50 m buffer around watercourses wherever possible. Detailed Drainage Strategy to be developed and agreed with SEPA and The Highland Council. To detail drainage design to slow surface water flows and ensure that run-off from hard surfaces will be controlled. Appropriate design of water crossings to maintain continuous flows.	Negligible	Adverse
Alteration to fluvial geomorphology	Minor	Adverse	Appropriately designed drainage and watercourse crossings.	Negligible	Adverse

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Coille Linne Wind Farm

Environmental Impact Assessment Report Volume 1 Chapter 11: Noise

May 2025

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11 NOISE

Introduction

- 11.1 This chapter considers the potential effects of noise immissions from Coille Linne Wind Farm (the 'Proposed Development').
- 11.2 Noise impacts could potentially arise during the construction, operational, and decommissioning phases of the proposed development.
- 11.3 For the purposes of this assessment, the selected candidate turbine model is the Vestas V162 with a power output rated at 7.2MW and a tip height of 250m. This turbine has been selected to assess the worst-case scenario for noise impacts while still aligning with the project design criteria.
- 11.4 Potential cumulative impacts from nearby operational and consented projects, as well as those under consideration by The Highland Council (THC), have also been evaluated.
- 11.5 The project was assessed using a combination of propagation modelling and ETSU-R-97 noise limits.
- 11.6 This chapter is also supported by the following figures as contained within Volume 2: Figures:
- Figure 11.1: Noise Study Area
 - Figure 11.2: Cumulative Noise Study Area
- 11.7 The chapter is supported by a number of Technical Appendices (as set out within Volume 4: Technical Appendices), comprising:
- Technical Appendix 11.1: Topographic Corrections
 - Technical Appendix 11.2: Cumulative Sound Power Levels
 - Technical Appendix 11.3: Background Noise Survey
 - Technical Appendix 11.4: Directivity Assessment
 - Technical Appendix 11.5: Proposed Development Noise Limits
- 11.8 The author of this Chapter, Kira Marshall (BA, MIOA), is a Senior Acoustic Consultant with over 3 years of experience in the production of noise impact assessment for wind turbines across Scotland.
- 11.9 The technical reviewer for this chapter, Merlin Garnett (MSc, MIOA), is a Principal Noise Consultant with more than 12 years of relevant experience in the production of noise impact assessments for wind turbine and hybrid energy projects of all scales across the UK.

Terminology

11.10 A brief description of the terminology used within the chapter is provided below:

- The wind speeds referred to in this report are **Standardised 10m wind speeds (v_{10})**. This is calculated from hub height wind speeds translated to 10m height above ground level assuming a standard roughness length of 0.05m. All turbine sound power levels are quoted with reference to standardised 10m wind speeds.
- **Sound pressure level (SPL)** is a logarithmic measure of the effective sound pressure of a sound relative to a reference value: $20 \mu\text{Pa}^1$. It is measured in decibels (dB) above this standard reference level. The SPL descriptors referenced in this report are:
 - **$L_{A,eq}$** is the A-weighted equivalent continuous sound pressure level measured over a specific time. L_{eq} is the single figure sound level that contains the same acoustical energy as the actual fluctuating sound level.
 - **$L_{A90,10min}$** is the A-weighted sound pressure level exceeded for 90 percent of the time in the averaging time interval specified – in this case 10 minutes – and is the index most widely used for background noise level measurements.
- **Sound Power Level (L_{WA})** is the decibel equivalent of the rate of energy (or power) emitted in the form of sound. The sound power level is an inherent property of a sound source. (the reference value for sound power is $1 \times 10^{-12} \text{W}$).
- **Immission** is the propagated sound energy that reaches a receptor.
- **Emission** is another way of describing sound power (see above).

Policy and Guidance

Policy

- 11.11 Chapter 5: Renewable Energy and Planning Policy of the EIA Report sets out the planning policy framework that is relevant to the EIA process and the proposed development. The policies set out include those from The Highland Council Local Development Plan (LDP), relevant aspects of NPF4 (National Planning Framework 4) (2023), Planning Advice Notes and other relevant guidance.
- 11.12 The following sources provide guidance on the assessment of wind turbine noise:
- Scottish Government (2022): Onshore Wind Policy Statement
 - Scottish Government (2014): Onshore wind turbines: Planning Advice
 - Planning Advice Note 1/2011 (PAN1/2011): Planning and Noise
 - The Highland Council (2016): Onshore Wind Energy Supplementary Guidance
- 11.13 Onshore wind turbines: Planning advice endorses the use of ETSU-R-97 and the Institute of Acoustics', 'Good Practice Guide' for the assessment of operational wind turbine noise (see below).

¹ μPa is the symbol for micropascal.

Guidance

Construction/Decommissioning Phase Noise

11.14 Guidance for the assessment of construction noise is given in:

- BS 5228-1:2009+A1:2014 - Code of practice for noise and vibration control on construction and open sites (British Standards, 2009;2014)

11.15 The standard provides indicative source sound level data for a variety of construction plant for use within the calculations and suggests appropriate fixed noise limits. Assessment of the significance of impacts can be made through comparison of predicted levels with defined criteria.

Operational Phase Noise

11.16 Guidance for assessing operational noise from wind farms is given in:

- The Institute of Acoustics, 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' (The Institute of Acoustics, 2013) (referred to as IoA Good Practice Guide)

11.17 This guidance was developed to standardise the approach to noise assessment of wind farms in the UK. The guidance also provides advice on the form of planning conditions that should be adopted for wind farm projects. The IoA GPG does not address the question of what noise limits should be applied as this has been determined by government.

11.18 The basis for operational wind farm noise limits that have been adopted in the UK is given in:

- The Department of Trade and Industry, 'ETSU-R-97: The Assessment and Rating of Noise from Wind Farms' (The Department of Trade and Industry, 1996) (referred to as ETSU-R-97)

11.19 National planning guidance is clear that the IoA Good Practice Guide and ETSU-R-97 should be followed in the assessment of operational noise from wind farms.

11.20 Supplementary Planning Guidance Note Ref: SPG.12 NLLP Policy EDI.3(A)2, refers to consideration of PAN 1/2011 - Planning and Noise. PAN 1/2011 includes an endorsement of ETSU-R-97 as the overarching assessment framework for wind turbine noise.

11.21 The Highland Council Onshore Wind Energy Supplementary Guidance (2016) endorses the use of both ETSU-R-97 and the IoA Good Practice Guide as representing best practices in the assessment of operational wind turbine noise for turbines with a rotor diameter of 16m and above.

Relevant Standards

- 11.22 The International Standard ISO 9613, 'Acoustics – Attenuation of Sound During Propagation Outdoors - Part 2' (International Standard, 2024), noise propagation model has been used for the turbine noise calculations.
- 11.23 The International Electrotechnical Commission's Technical Specification document IEC/TS 61400-14:2005 – 'Part 14: Declaration of apparent sound power level and tonality values' provides a method to derive appropriate sound power level values from a number of independent sources to improve robustness.

Low Frequency Noise

- 11.24 The planning guidance (Scottish Government, 2014) is clear; that there is no empirical evidence that infrasound or low frequency noise (LFN) is an issue at receptor distances from a wind farm and refers to the 2006 study carried out by Hayes McKenzie on behalf of the Department of Trade and Industry (DTI) (Hayes McKenzie, 2006). The report investigates the potential impact of infrasound or low frequency noise arising from wind turbines. The study concluded that infrasound or low frequency noise arising from the operation of wind turbines did not result in adverse health impacts.
- 11.25 A further research study stated the level of infrasound due to wind turbines is low in comparison to other technical and natural sources (Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg, 2016). The findings concluded "That adverse effects relating to infrasound from wind turbines cannot be expected on the basis of the evidence at hand."
- 11.26 This chapter does not therefore give any further consideration to potential low frequency noise effects.

Vibration

- 11.27 In 2005, the Applied and Environmental Geophysics Research Group at Keele University conducted an extensive study titled 'Microseismic and Infrasound Monitoring of Low Frequency Noise and Vibrations from Windfarms' (Styles, et al., 2005). The study was requested by the Ministry of Defence (MOD), the Department for Trade and Industry (DTI) and the British Wind Energy Association with the aim of establishing an acceptable limit that would not interfere with the detection capabilities of the seismic monitoring site located in Eskdalemuir, Scotland. The results of the investigation found that low levels of vibration and infrasound could be detected, with measurement apparatus, at large distances from the wind turbines included in the survey. The report concluded that a 10km buffer zone could be adopted at Eskdalemuir to protect the site from the interference due to wind turbines.
- 11.28 The outcome of this study has since been misinterpreted as the potential for adverse effects at residential receptors. The authors of the paper have clarified that:

"The levels of vibration from wind turbines are so small that only the most sophisticated instrumentation and data processing can reveal their presence, and they are almost impossible to detect."

11.29 They also confirmed that the level of vibration measured was not unique to wind turbines:

“Vibrations at this level and in this frequency range will be available from all kinds of sources such as traffic and background noise - they are not confined to wind turbines.” (Renewable UK, 2010)

11.30 A more recent study on the human perception of vibration from wind turbines was published in 2020 (Nguyen, et al., 2020) . The paper presents vibration measurements from inside properties at varying distances from a wind farm. The study compares the results against criteria given in the documents AS 2670-1 (1990) (Australian Standards, 1990) and BS 6472-1 (2008) (British Standards, 2008) and suggests there is a low probability of adverse impact.

11.31 Therefore, as current research continues to conclude that vibration due to wind farms is very unlikely to disturb residential amenity, an assessment of vibration is not within the scope of the Noise Impact Assessment (NIA).

Amplitude Modulation

11.32 Amplitude Modulation (AM) as an element of turbine noise has been the subject of considerable research in recent years. The University of Salford conducted a study on behalf of the Department for Business, Enterprise and Regulatory Reform to investigate whether noise complaints arising from wind farms were due to the presence of AM. The report found that complaints were highly likely to be caused by AM in 4 out of the 27 wind farms included in the study. However, it concluded, *“that the causes of AM are not fully understood, and that AM cannot be fully predicted at current state of the art”* (University of Salford, 2007). The findings of the investigation were reconfirmed in 2013 in an updated research report by Renewable UK (Renewable UK, 2013).

11.33 The IoA produced ‘A Method for Rating Amplitude Modulation in Wind Turbine Noise’ (Institute of Acoustics, 2016), in which amplitude modulation is defined as the following:

“Wind turbine amplitude modulation is defined as periodic fluctuations in the level of audible noise from a wind turbine (or wind turbines), the frequency of the fluctuations being related to the blade passing frequency of the turbine rotor(s).”

11.34 The report acknowledges that certain levels and/or characteristics of amplitude modulation may lead to disturbance and noise complaints. The guidance does not aim to define the level at which AM could pose an issue but outlines a proposed methodology to assess and rate AM arising from operational wind farms.

11.35 The Wind Turbine AM Review - Phase 2 report (WSP | Parsons Brinckerhoff, 2016) went on to propose a penalty scheme that could be applied by planning condition to limit the extent of operational AM, where required.

11.36 Currently, there is no established predictive method of assessment for amplitude modulation prior to construction and operation of a wind farm. As such, the assessment of AM is scoped out of the NIA.

Consultation

- 11.37 As part of the Scoping exercise, a consultation exercise was undertaken to inform the design of the proposed development and to seek agreement on potential significant environmental effects that result from the proposed development as well as the scope of any assessment work required as part of this EIA.
- 11.38 The Scoping Opinion was received from The Scottish Government Energy Consents Unit on 20th September 2024 under reference **ECU00005163**.
- 11.39 Consultation relevant to the Noise assessment was undertaken with The Highland Council Environmental Health, received 6th September 2024, who commented on aspects of methodology, sources of information, scope of assessment and cumulative development. A summary of these consultation responses is provided in **Table 11.1**.

Table 11.1: Consultation Responses

Consultee	Date Received	Consultation Response	Where and how is this addressed?
The Highland Council	06/09/2024	A construction assessment should be undertaken if: "the applicant intends to undertake noisy work out-with the aforementioned times, they will be required to submit a detailed construction noise assessment for the written approval of the planning authority."	As there were no indications that extended working hours would be required, a construction noise assessment has been scoped out of this study. Under Section 60 of the Control of Pollution Act (1974) the Local Authority has powers to control the impact of construction noise. The developer/contractor will also employ best practicable means to reduce any potential impact from construction work.
The Highland Council	06/09/2024	The applicant must submit a noise assessment with regard to the operational phase of the development. The assessment should be carried out in accordance with ETSU-R-97 "The Assessment and Rating of Noise from Wind Farms" and the associated Good Practice Guide published by the Institute of Acoustics. The target noise levels requested by THC also reference the simplified 35dB LA90 at wind speeds up to 10m/s or a composite standard of 35dB LA90 (daytime) and 38dB LA90 (night time) or up to 5dB above background noise levels at up to 12m/s. The night-time lower limit	The NIA has been conducted in line with ETSU-R-97 and the loA Good Practice Guide. As per THC preference for setting target noise limits, the project night-time lower limit will reference 38dB(A).

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		of 43dB LA90 as suggested in ETSU is not considered acceptable in many areas of the highlands due to very low background levels. These limits would apply to cumulative noise levels from more than one development.	
The Highland Council	06/09/2024	A cumulative noise assessment should be undertaken to assess potential cumulative noise impacts at the nearest sensitive receptors to the proposed development. The noise assessment must take into account predicted and consented levels from such development.	A cumulative noise assessment has been undertaken on this basis. The assessment includes cumulative levels with both predicted and consented levels from third-party developments as requested by THC.
The Highland Council	06/09/2024	If the application includes a proposal for a sub-station or a Battery Energy Storage System, a separate noise assessment may be required.	The proposed substation and 5MW energy storage are located approximately 4.4km from the nearest residential receptor. As such, potential noise impacts would not be significant, and a detailed assessment has been scoped out of the NIA.
The Highland Council	10/12/2024	Additional consultation regarding the cumulative noise assessment was conducted. The EHO confirmed that as the predictions for Sallachy Wind Farm are close to the consented limits, the project should be assessed as the limit rather than prediction plus a margin of headroom. It was also discussed that where cumulative predictions exceed the simplified 35dB(A) a background survey should be conducted as the first step. Where needed, arguments for a higher cumulative limit can be presented and consideration of directivity and exposure time should be included.	Following this consultation a background survey was conducted at the nearest NSR. The cumulative noise assessment includes an assessment of Sallachy Wind Farm operating at the consented limits – adjusted for controlling properties as per IoA Good Practice Guide. The assessment puts forward the argument for a higher cumulative lower limit to allow both developments to operate, and comments on directivity and level of impact at the assessment receptors.
The Highland Council	09/01/2025	The background monitoring methodology was submitted to the EHO for comment prior to the survey commencement. The EHO confirmed they were happy with the methodology.	The survey was conducted at one location with care given to the siting of the equipment to ensure watercourses did not impact the data.

Consultee	Date Received	Consultation Response	Where and how is this addressed?
The Highland Council	26/03/2025	Discussion with EHO about the minimum required headroom for the project to comply with ETSU noise limits. Update to mitigation impact if the daytime cumulative limits were to reference a lower limit of 35dB(A). Request for a results table including directivity adjustments.	The cumulative assessment has been updated to demonstrate level of exceedance with a cumulative daytime lower fixed limit of 35dB(A) ² and a new proposed lower fixed limit of 36.5dB(A). Arguments for a higher cumulative limit have been updated following the results of the background survey. A table of results including directivity adjustments is now included in Technical Appendix 11.4. ³
The Highland Council	15/04/2025	The EHO confirmed they were happy with the proposed cumulative lower daytime limit of 36.5dB(A) and the apportioned limits, detailed in Technical Appendix 11.5, for the Proposed Development.	No further changes have been made to the following assessment.

Scope of Assessment

Effects Assessed in Full

11.40 The following effects were considered to be potentially significant in relation to noise at the scoping stage and have been assessed in full within this chapter:

- Operational noise impacts arising from the Proposed Development
- Potential cumulative noise impacts at the nearest sensitive receptors

Effects Scoped Out

11.41 The nearest receptor is located approximately 2.7km from the closest turbine and it is understood that construction works will take place during standard working hours. Therefore, a construction noise assessment has been scoped out of the Noise Impact Assessment (NIA).

11.42 The proposed substation and 5MW battery storage are located approximately 4.4km from the nearest residential receptor. As such, potential noise impacts would not be significant. Therefore, an assessment of substation and Battery Energy Storage System has been scoped out of the NIA.

² Or background plus 5dB, whichever is the greater

³ Or background plus 5dB, whichever is the greater

Assessment Methodology and Significance

Cumulative Effects

- 11.43 When considering cumulative impact from two or more developments at a given property the IoA Good Practice Guide states:

'If the proposed wind farm produces noise levels within 10dB of any existing wind farm/s at the same location, then a cumulative noise impact assessment is necessary.'

- 11.44 Noise immissions from all wind projects, inclusive of the Proposed Development, deemed to lie within the cumulative search area should be limited to a level that does not exceed the total limits set out in ETSU-R-97.

- 11.45 Where an existing wind farm has been consented to the full ETSU-R-97 limits, the IoA Good Practice Guide allows for adjustments due to a "controlling property" and states:

'It may be the case that for the existing wind farm to operate to the total ETSU-R-97 noise limits at a key cumulative receptor it would have to breach the noise limit at another receptor (i.e. a receptor closer to the existing wind farm than the key cumulative receptor). Consideration could then be given to the available 'headroom' at the key cumulative receptor such a scenario permits.'

Study Area

- 11.46 The study area adopted for the identification of Noise Sensitive Receptors (NSR) was the 35dB(A) noise contour as calculated from the Proposed Development.
- 11.47 Similarly, NSRs with the potential to be impacted by cumulative noise were identified as those located within a 25dB(A) noise contour on the basis that immission levels lower than 25dB(A) would be more than 10dB below the simplified ETSU limit of 35dB(A), and therefore, can be considered as non-cumulative.
- 11.48 Where NSRs were located adjacent to each other or readily formed a grouping, a single Noise Assessment Location (NAL) was selected representing the closest of the adjacent receptors to the Proposed Development. NALs were positioned at NSRs, 15m from a dwelling façade in the direction of the nearest Project turbine or as far in that direction as the curtilage would allow.
- 11.49 This approach follows the ETSU-R-97 principle of assessing nearest receptors; focussing on the highest impacts allows for a more concise assessment.
- 11.50 The identified NALs are shown on **Figure 11.1: Noise Study Area** and detailed in **Table 11.8**.

Desk Based Study and Data Sources

Noise Limits

- 11.51 THC request that a lower limit of 35dB(A) for quiet daytime periods and 38dB(A) for night-time periods, or 5dB(A) above the background noise levels, whichever the greater, should be applied. For locations where the resident has a demonstrable financial involvement in the project, a lower fixed limit of 45dB(A) is applicable, or 5dB(A) above the background noise levels, whichever is the greater.
- 11.52 THC Supplementary Guidance states that a night-time lower limit of 43dB(A) suggested in ETSU is not considered acceptable due to the remote nature of many dwellings within the Highlands, resulting in lower background noise levels.

Table 11.2: ETSU-R-97 assessment periods

The quiet daytime periods (amenity hours) are:	
18:00 - 23:00	Monday to Friday
13:00 - 23:00	Saturdays
07:00 - 23:00	Sundays
Night-time periods are: 23:00 – 07:00 every day	

- 11.53 For a project whose noise immission levels are not expected to exceed 35dB(A) at the closest Noise Sensitive Receptors (NSRs), a simplified approach may be taken that allows the project to be approved with a single fixed 35dB(A) noise limit applicable at all times or 45dB(A) where a resident has financial involvement. Where proposed project noise levels exceed 35dB(A), the ETSU-R-97 noise assessment should be undertaken with reference to noise limits derived from background noise levels.
- 11.54 For the Proposed Development, a simplified 35dB(A) ETSU-R-97 limit is sufficient to protect nearby properties from significant operational noise impacts from the proposed turbines in isolation. As noted in Section 5.5 of the IoA Good Practice Guide, where concurrent applications and/or third-party wind developments are consented to less than the total ETSU-R-97 limits, it would be appropriate to assign an apportioned limit to the proposed individual development.

Propagation Model

- 11.55 The International Standard ISO 9613, 'Acoustics – Attenuation of Sound During Propagation Outdoors - Part 2', sound propagation model has been used for the turbine immission calculations. L_{Aeq} sound propagation was modelled using WindFarm v5.0.1.2 by ReSoft. Predicted wind turbine immission levels were calculated, inclusive of appropriate allowance for measurement uncertainties.
- 11.56 LA_{90} levels were derived by subtracting two decibels from the L_{Aeq} values as per the ETSU-R-97 guidance and subsequent IoA GPG. The input parameters shown in **Table 11.3** have been used and are consistent with the IoA Good Practice Guide.

Table 11.3: Propagation input parameters

Attenuation factor, G (all regions)	
Receptor height (m)	10
Attenuation factor, G (all regions)	70
Receptor height (m)	
Attenuation factor, G (all regions)	0.5 (semi-soft ground) (0 for areas of water)
Receptor height (m)	4.0

- 11.57 The attenuation of sound as it travels through the air varies with frequency. The atmospheric attenuation coefficients used in the assessment, corresponding to the assumptions in **Table 11.3**, are tabulated in **Table 11.4** below.

Table 11.4: Attenuation coefficients used for the sound propagation model

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000
Attenuation Coefficient (dB/km)	0.12	0.41	1.04	1.93	3.66	9.66	32.77	116.88

Barrier Effect

- 11.58 Line of sight visibility was checked between proposed turbines and each receptor's assessment position at 4m height. Where a turbine is not visible from any assessment position (at 4m height) a -2dB adjustment to the predicted level from the screened turbine(s) is applicable. Any adjustments are reported in **Technical Appendix 11.1**.

Valley Effect

- 11.59 Certain topographic characteristics have the potential to reinforce the propagation of sound between two locations. The IoA Good Practice Guide refers to these characteristics as a 'valley' to describe a concave topographic profile. Where these criteria are met, a +3dB correction should be added to the predicted noise levels. Any adjustments are reported in **Technical Appendix 11.1**.

Directivity

- 11.60 Where turbine sound propagates from opposing directions relative to an NSR, the result will be a reduction in predicted noise, as the receptor will not experience simultaneous downwind conditions from both directions. Example reductions are given in the IoA Good Practice Guide at section 4.4. A directivity assessment has been conducted to provide context to the potential cumulative impact at receptors. However, no adjustments for directivity were included in the predicted immission levels.

Sound Power Levels

- 11.61 The proposed candidate turbine for the Proposed Development is the Vestas V162 rated at 7.2MW with a tip height of 250m. The turbine rotors would be fitted with Trailing Edge Serration (TES), a technology that reduces noise emissions. These reductions are reflected

in the sound power values obtained from the manufacturer's sound power report (Document no: 0114-3777 V03) dated 2022-07-01 as given in **Table 11.5**.

Table 11.5: Octave band sound power level for the V162 7.2MW

Octave Band (Hz)	V10 wind speed (ms ⁻¹)								
	4	5	6	7	8	9	10	11	12
	Sound Power Level [LWA] for a hub height of 169m [dB(A)]								
63	79.2	83.9	87.8	88.3	88.5	88.5	88.5	88.5	88.5
125	86.3	91.6	95.4	95.9	96.1	96.3	96.4	96.4	96.4
250	89.3	94.8	98.6	99.1	99.3	99.5	99.8	99.8	99.8
500	90.1	95	98.8	99.3	99.5	99.8	100.2	100.2	100.2
1000	88.7	93.4	97.1	97.6	97.9	98.3	98.7	98.7	98.7
2000	84.4	88.9	92.5	93	93.4	93.8	94.2	94.2	94.2
4000	77	81.3	84.9	85.4	85.9	86.3	86.6	86.6	86.6
8000	66.6	70.6	74.1	74.7	75.3	75.7	75.9	75.9	75.9
Total	95.4	100.4	104.2	104.7	104.9	105.2	105.5	105.5	105.5
Uncertainty	2	2	2	2	2	2	2	2	2
IoA Total	97.4	102.4	106.2	106.7	106.9	107.2	107.5	107.5	107.5

- 11.62 In the absence of stated uncertainty, an additional +2dB has been applied to the declared sound power levels to account for uncertainty, as recommended with the IoA Good Practice Guide.
- 11.63 Regarding tonality, the IoA Good Practice Guide States “When such information is available, it should be appropriately applied. It is standard to control the potential presence of tones in practice through the use of suitable planning conditions.”
- 11.64 Information regarding tonality were not included in the manufacturer's sound power report. In line with IoA Good Practice Guide, it is proposed that the provision of manufacturer warranties regarding tonality are included within suitable planning conditions.
- 11.65 Sound power details for cumulative projects are given at **Technical Appendix 11.2**.

Field Survey

- 11.66 There were no NSRs identified within the proposed development 35dB(A) study area. Additionally, no NSRs were identified within a cumulative 35dB(A) contour. While cumulative levels have the potential to exceed 35dB(A) when considering consented levels, the level of exceedance is small.
- 11.67 A background survey was conducted, in consultation with The Highland Council, between 16 January and 13 February 2025 at one location chosen as being representative of the NSRs within the assessment study area.

11.68 Wind data was collected at concurrent 10m intervals using a LiDAR capable of measuring wind speed and direction up to 200m above ground level. Hub height wind speed data was standardised to 10m wind speeds and correlated with noise level data using regression analysis with 'best fit' polynomial trends of up to fourth order. Once extraneous or atypical data had been removed, these trend lines then formed the basis of the ETSU-R-97 limits against which immission levels from the Proposed Development were assessed.

11.69 **Table 11.6** details the location of the background monitoring.

Table 11.6: Baseline survey location

Location	ID	Easting	Northing
East Overscaig	MP1	242318	922647

11.70 The background sound levels for both day and night-time are provided in **Table 11.7** below.

Table 11.7: Baseline survey sound levels (MP1)

Period	Standardised V10 wind speed (ms ⁻¹)								
	4	5	6	7	8	9	10	11	12
Day	26.8	27.2	28.4	30.3	33.3	37.5	43.2	-	-
Night	26.1	27.5	29.8	32.7	36.0	39.3	42.5	45.3	47.3

11.71 Full details of the baseline survey and data analysis are provided in **Technical Appendix 11.3**.

Assessment of Significance

11.72 The assessment of operational noise impacts arising from the proposed development takes the form of an ETSU-R-97 assessment following the IoA Good Practice Guide.

11.73 Noise impacts from the operation of the Proposed Development have initially been assessed as a singular project; the potential for cumulative effects has then been considered.

Assumptions and Limitations

11.74 When assessing third party wind developments, it has been assumed that the wind farm is operating without mitigation and complies with the consented noise limits.

11.75 The operational assessment has been conducted assuming the candidate turbine model of Vestas V162 7.2MW. Following determination of the proposed development the turbine to be installed will be subject to a tendering process. The turbine model chosen will be selected such that derived noise limits are still complied with.

Baseline Conditions

11.76 The proposed development is located approximately 21.9km north of Lairg, a rural upland village located with The Highland Council area.

- 11.77 The proposed layout configuration showing turbine positions and nearest NALs is shown in **Figure 11.1: Noise Study Area**. The contours enclose areas predicted to receive an L_{90} turbine noise level in excess of 25dB(A) and 35dB(A) from the Proposed Development; given for a v_{10} wind speed of 10ms^{-1} (maximum sound power for the candidate turbine in normal operating mode). In this case, the 25dB(A) contour has been used to determine NSR locations with the potential for cumulative effects.
- 11.78 **Table 11.8** lists the names, noise assessment location, GPS coordinates and minimum distance to the proposed turbines for each NSR. It should be noted that the nearest NAL is 2765m from the proposed development; this is a relatively large setback distance.

Table 11.8: Details of noise assessment locations

Location	NSR	Easting	Northing	NAL	Easting	Northing	Distance to nearest turbine (m)
Fiag Lodge	NSR 1	245415	928145	NAL1	245416	928126	2765
East Overscaig	NSR 2	242325	922615	NAL2	242320	922633	3000
Carrachin, Loch Shin	NSR 3	242227	922724	NAL3	242249	922727	3015
Oak Lodge	NSR 4	241763	923173	NAL4	241763	923193	3290
Overscaig Hotel	NSR 5	241722	923258	NAL5	241730	923271	3300
Overscaig House	NSR 6	241544	923284	NAL6	241551	923300	3465
Overscaig Bungalow	NSR 7	241388	923456	NAL7	241396	923473	3580

Cumulative Search Area

- 11.79 **Figure 11.2: Cumulative Noise Study Area** identifies third-party wind turbines that have the potential for cumulative impacts to occur.
- 11.80 Creag Riabhach (Operational) and Shinness Wind Farms (In Planning) are located approximately 6.5km and 9.5km, respectively, from the nearest NAL. Associated predicted levels are not within 10dB of the proposed development, therefore, these developments were assessed to be non-cumulative and were not considered further.
- 11.81 One third party site, Sallachy, was identified for inclusion within the cumulative assessment. Sallachy Wind Farm (21/01615/FUL) was consented in May 2022 and consists of 9 turbines up to 149.9m tip height. Presently, details of the turbine model to be installed are not known and the site has been assessed based on the planning candidate turbine of Nordex N133 4.8MW. The site was consented with a simplified 35dB(A) limit, and the cumulative assessment considers both predicted and consented levels, as per THC scoping response.

Cumulative noise limits

- 11.82 As required by THC, the cumulative assessment should also consider consented levels. Sallachy Wind Farm was consented with a simplified 35dB(A) noise limit with NAL2 also

being the nearest residential receptor. As Sallachy is consented to the simplified ETSU-R-97 limit, any inclusion of the Proposed Development would cause the lower limit to be exceeded at two locations (NAL2 and NAL3).

- 11.83 The ETSU-R-97 guidelines provide the facility to set a lower limit between 35 and 40dB(A) for daytime periods. To determine the lower limit applicable for total cumulative immission levels, the three criteria for consideration, as provided within ETSU-R-97 are:
- the number of noise-affected properties;
 - the potential impact on the power output of the wind farm; and
 - the likely duration and level of exposure.
- 11.84 There are a low number of potentially affected properties, with seven identified within the study area; only two of these are predicted to receive cumulative immission greater than 35dB(A) when considering consented levels from third-party developments. This demonstrates that the overall impact in the area is limited in terms of noise.
- 11.85 In addition to the limited overall noise impact, the proposed development would have a total operating capacity of 108MW providing a significant contribution to energy production. If the daytime cumulative lower fixed limit was restricted to the minimum applicable limit of 35dB(A), immission levels from the proposed development could not exceed 25dB(A) at NAL2 in order for those limits not to be exceeded (10dB below). To restrict the proposed development to this level, six turbines would need to be switched off at 6m/s and eight turbines switched off at 7m/s, when the wind direction is from the northwest, reducing the potential total power output by 40% and 53% respectively at those wind speeds and wind direction. While no mitigation would be required at 8m/s and above, the mitigated windspeeds would be among the most common and therefore would be expected to have a significant impact on energy yield. However as set out in Table 11.2, a higher noise limit has been agreed with EHO.
- 11.86 Further to this, the assessment assumes a worst-case scenario in respect of downwind propagation. In this site location, the most common wind directions are south-west (215° – 255°) during which the proposed development would not be directly downwind of the receptors. Applying the IoA Good Practice Guide recommendations for directivity attenuation⁴, proposed development immission levels during these wind directions would reduce by an average of 4dB at the most impacted receptors. This results in a cumulative predicted immission level of ≈33dB(A). Additionally, at NAL2 and NAL3 the minimum directivity reduction across all wind directions for cumulative predictions is 0.4dB, showing the worst-case levels would not result in practice. Further details of the directivity assessment are available in **Technical Appendix 11.4**. This analysis shows the proposed development does not present the potential for a significant increase in exposure to turbine noise relative to baseline. Given the NSR setbacks, the potential for any audibility at all is considered to be very limited.
- 11.87 Based on the above considerations, and further consultation with Environmental Health, it is recommended that 36.5dB(A) be adopted for the cumulative daytime lower fixed limit. This would allow the proposed development to operate without curtailment while having

⁴ Provided on p22, section 4.4, of the IoA Good Practice Guide (2013)

an operational margin of a modest 1dB above predicted immision levels; which equates to a maximum proposed project level of less than 32dB(A). Proposed project limits are provided at **Technical Appendix 11.5**.

Cumulative Noise Limits

- 11.88 The measured background profile has been applied to NALs 2-7, as these properties are all situated south of the Proposed Development near Loch Shin and are therefore assumed to have similar acoustic environments. NAL1 (Fiag Lodge) is located to the north of the Proposed Development and is non-cumulative, as such the simplified ETSU-R-97 limit of 35dB(A) has been applied here.
- 11.89 The limit levels determined from the background noise survey, proposed ETSU-R-97 daytime lower limits and Highland Council night lower limit, are listed in **Table 11.9** and **Table 11.10**.

Table 11.9: Daytime cumulative Limits

L90	dB(A)	V10 wind speed (ms ⁻¹)								
Location	Name	4	5	6	7	8	9	10	11	12
NAL1	Fiag Lodge	35	35	35	35	35	35	35	35	35
NAL2	East Overscaig	36.5	36.5	36.5	36.5	38.3	42.5	48.2	48.2	48.2
NAL3	Carrachin, Loch Shin	36.5	36.5	36.5	36.5	38.3	42.5	48.2	48.2	48.2
NAL4	Oak Lodge	36.5	36.5	36.5	36.5	38.3	42.5	48.2	48.2	48.2
NAL5	Overscaig Hotel	36.5	36.5	36.5	36.5	38.3	42.5	48.2	48.2	48.2
NAL6	Overscaig House	36.5	36.5	36.5	36.5	38.3	42.5	48.2	48.2	48.2
NAL7	Overscaig Bungalow	36.5	36.5	36.5	36.5	38.3	42.5	48.2	48.2	48.2

Table 11.10: Night-time cumulative Limits

L90	dB(A)	V10 wind speed (ms ⁻¹)								
Location	Name	4	5	6	7	8	9	10	11	12
NAL1	Fiag Lodge	35	35	35	35	35	35	35	35	35
NAL2	East Overscaig	38	38	38	38	41.0	44.3	47.5	50.3	52.3
NAL3	Carrachin, Loch Shin	38	38	38	38	41.0	44.3	47.5	50.3	52.3
NAL4	Oak Lodge	38	38	38	38	41.0	44.3	47.5	50.3	52.3
NAL5	Overscaig Hotel	38	38	38	38	41.0	44.3	47.5	50.3	52.3
NAL6	Overscaig House	38	38	38	38	41.0	44.3	47.5	50.3	52.3
NAL7	Overscaig Bungalow	38	38	38	38	41.0	44.3	47.5	50.3	52.3

Identification and Evaluation of Key Effects

Operational Effects

Predicted L90 Project Levels

- 11.90 Topographic screening was found to occur between the proposed turbines and the NALs. Concave profiles were not identified between the proposed development and the NALs, as such, no valley correction has been applied. All adjustments are detailed in **Technical Appendix 11.1**.
- 11.91 The following predicted L_{A90} immission levels, shown in **Table 11.11**, were calculated using the octave band sound power levels detailed in **Table 11.5** that are inclusive of allowable uncertainty. The assumed level of uncertainty may overestimate actual uncertainty resulting in an overestimate of immission levels.

Table 11.11: Proposed Development immission levels

L90	dB(A)	V10 wind speed (ms ⁻¹)								
Location	Name	4	5	6	7	8	9	10	11	12
NAL1	Fiag Lodge	18.7	23.9	27.7	28.2	28.4	28.6	28.8	28.8	28.8
NAL2	East Overscaig	20.5	25.7	29.5	30.0	30.2	30.4	30.6	30.6	30.6
NAL3	Carrachin, Loch Shin	20.3	25.5	29.3	29.8	30.0	30.2	30.5	30.5	30.5
NAL4	Oak Lodge	19.0	24.1	28.0	28.5	28.7	28.9	29.1	29.1	29.1
NAL5	Overscaig Hotel	18.9	24.1	27.9	28.4	28.6	28.8	29.0	29.0	29.0
NAL6	Overscaig House	18.0	23.2	27.0	27.5	27.7	27.9	28.2	28.2	28.2
NAL7	Overscaig Bungalow	17.8	23.0	26.8	27.3	27.5	27.7	27.9	27.9	27.9

- 11.92 **Table 11.12** details the exceedance of proposed development immission levels relative to a simplified 35dB(A) ETSU-R-97 limit.

Table 11.12: Exceedance of a simplified 35dB(A) ETSU-R-97 limit

L90	dB(A)	V10 wind speed (ms ⁻¹)								
Location	Name	4	5	6	7	8	9	10	11	12
NAL1	Fiag Lodge	-16.3	-11.1	-7.3	-6.8	-6.6	-6.4	-6.2	-6.2	-6.2
NAL2	East Overscaig	-14.5	-9.3	-5.5	-5.0	-4.8	-4.6	-4.4	-4.4	-4.4
NAL3	Carrachin, Loch Shin	-14.7	-9.5	-5.7	-5.2	-5.0	-4.8	-4.5	-4.5	-4.5
NAL4	Oak Lodge	-16.0	-10.9	-7.0	-6.5	-6.3	-6.1	-5.9	-5.9	-5.9
NAL5	Overscaig Hotel	-16.1	-10.9	-7.1	-6.6	-6.4	-6.2	-6.0	-6.0	-6.0
NAL6	Overscaig House	-17.0	-11.8	-8.0	-7.5	-7.3	-7.1	-6.8	-6.8	-6.8
NAL7	Overscaig Bungalow	-17.2	-12.0	-8.2	-7.7	-7.5	-7.3	-7.1	-7.1	-7.1

- 11.93 All NALs are predicted to receive noise immission levels of less than 31dB(A) from the proposed development in isolation. Results in **Table 11.11** show that the proposed development is predicted to produce a maximum level of 30.6dB(A) at 10m/s at NAL2.
- 11.94 When assessing the predicted operational immission levels against the simplified 35dB(A) ETSU-R-97 limit (**Table 11.12**), a minimum compliance margin of 4.4dB(A) is shown, demonstrating that immission from the Proposed Development in isolation, would comfortably meet a simplified 35dB(A) ETSU limit at all receptors and is likely to result in a **negligible** level of impact.

Mitigation Measures and Monitoring

Operation

- 11.95 The assessment of operational immission from the Proposed Development assumed that the turbines would operate in their standard mode of operation using rotor blades fitted with trailing edge serration. The results demonstrated that immission from the proposed turbines would be able to meet a simplified 35dB(A) ETSU-R-97 noise limit at all receptors by a comfortable margin.
- 11.96 Therefore, operational noise assessments considering the Proposed Development in isolation demonstrate that no mitigation is required.

Cumulative Effects

Predicted Immission Levels

- 11.97 The review of cumulative wind developments resulted in the identification of one project for inclusion within the assessment. Sallachy Wind Farm consists of nine turbines and is located south of the identified NALs. As noted in the Sallachy Environmental Statement a valley correction has been applied to predicted levels. No screening was found to occur between the turbines and NALs. Full details are provided in **Technical Appendix 11.1**.
- 11.98 **Table 11.13** shows baseline cumulative immission levels applicable for both daytime and night-time periods, assuming simultaneous downwind propagation from all turbines.

Table 11.13: Baseline cumulative immission levels

L90	dB(A)	V10 wind speed (ms ⁻¹)								
Location	Name	4	5	6	7	8	9	10	11	12
NAL1	Fiag Lodge	4.3	9.8	14.0	14.6	14.6	14.6	14.6	14.6	14.6
NAL2	East Overscaig	22.0	27.5	31.7	32.3	32.3	32.3	32.3	32.3	32.3
NAL3	Carrachin, Loch Shin	21.7	27.2	31.4	32.0	32.0	32.0	32.0	32.0	32.0
NAL4	Oak Lodge	20.4	25.9	30.1	30.7	30.7	30.7	30.7	30.7	30.7
NAL5	Overscaig Hotel	20.2	25.6	29.9	30.5	30.5	30.5	30.5	30.5	30.5
NAL6	Overscaig House	20.1	25.6	29.8	30.4	30.4	30.4	30.4	30.4	30.4
NAL7	Overscaig Bungalow	19.6	25.1	29.3	29.9	29.9	29.9	29.9	29.9	29.9

11.99 **Table 11.14** shows the cumulative immission levels inclusive of the proposed development.

Table 11.14: Total cumulative immission levels

L90	dB(A)	V10 wind speed (ms ⁻¹)								
Location	Name	4	5	6	7	8	9	10	11	12
NAL1	Fiag Lodge	18.8	23.9	27.7	28.2	28.4	28.6	28.8	28.8	28.8
NAL2	East Overscaig	24.3	29.7	33.7	34.3	34.4	34.5	34.5	34.5	34.5
NAL3	Carrachin, Loch Shin	24.1	29.4	33.5	34.0	34.1	34.2	34.3	34.3	34.3
NAL4	Oak Lodge	22.8	28.1	32.2	32.7	32.8	32.9	33.0	33.0	33.0
NAL5	Overscaig Hotel	22.6	27.9	32.0	32.6	32.7	32.7	32.8	32.8	32.8
NAL6	Overscaig House	22.2	27.6	31.6	32.2	32.3	32.3	32.4	32.4	32.4
NAL7	Overscaig Bungalow	21.8	27.2	31.2	31.8	31.9	31.9	32.0	32.0	32.0

11.100 Predicted cumulative immission levels, both exclusive and inclusive of the proposed development, remain below the simplified 35dB(A) ETSU limit at all assessment locations, with a maximum predicted cumulative noise immission of 34.5dB(A), expected to occur at NAL2. Baseline levels at this location are predicted to be 32.3dB(A), inclusive of topography corrections. Introducing the proposed development would increase immission levels by 2.2dB. This level change would result in a **negligible impact** as the minimum perceptible change in the context of environmental noise is typically 3dB, as noted in Planning Advice Note 1/2011 (PAN1/2011). The cumulative total is a theoretical worst case as it assumes simultaneous downwind propagation from all turbines. The cumulative level is likely to be lower in practice and may not exceed background levels at the NSRs.

Consented Levels

11.101 The principles of controlling properties, as provided within the IoA Good Practice Guide, have been applied when considering the consented levels at Sallachy Wind Farm. This means that the full limit is applicable at NAL2 (nearest location to Sallachy) and is adjusted based on distance to all other locations.

11.102 **Table 11.15** shows baseline cumulative immission levels based on consented noise limits at Sallachy Wind Farm.

Table 11.15: Baseline cumulative immission levels with consented limits

L90	dB(A)	V10 wind speed (ms ⁻¹)								
Location	Name	4	5	6	7	8	9	10	11	12
NAL1	Fiag Lodge	7.0	12.5	16.7	17.3	17.3	17.3	17.3	17.3	17.3
NAL2	East Overscaig	24.7	30.2	34.4	35.0	35.0	35.0	35.0	35.0	35.0
NAL3	Carrachin, Loch Shin	24.4	29.9	34.1	34.7	34.7	34.7	34.7	34.7	34.7
NAL4	Oak Lodge	23.1	28.6	32.8	33.4	33.4	33.4	33.4	33.4	33.4
NAL5	Overscaig Hotel	22.9	28.3	32.6	33.2	33.2	33.2	33.2	33.2	33.2

L90	dB(A)	V10 wind speed (ms ⁻¹)								
NAL6	Overscaig House	22.8	28.3	32.5	33.1	33.1	33.1	33.1	33.1	33.1
NAL7	Overscaig Bungalow	22.3	27.8	32.0	32.6	32.6	32.6	32.6	32.6	32.6

11.103 Should the Proposed Development be consented, it is proposed that project specific limits should reference predictions plus a margin of headroom, as is usually requested when undertaking a cumulative assessment. In this case, the Proposed Development predictions have been increased by 1dB.

11.104 **Table 11.16** shows the cumulative immission levels inclusive of the proposed development based on proposed and consented limits.

Table 11.16: Total cumulative immission levels with consented limits

L90	dB(A)	V10 wind speed (ms ⁻¹)								
Location	Name	4	5	6	7	8	9	10	11	12
NAL1	Fiag Lodge	19.7	24.9	28.7	29.2	29.4	29.6	29.8	29.8	29.8
NAL2	East Overscaig	26.4	31.8	35.9	36.5	36.5	36.6	36.6	36.6	36.6
NAL3	Carrachin, Loch Shin	26.1	31.5	35.6	36.2	36.2	36.3	36.4	36.4	36.4
NAL4	Oak Lodge	24.8	30.2	34.3	34.9	34.9	35.0	35.1	35.1	35.1
NAL5	Overscaig Hotel	24.7	30.0	34.1	34.7	34.8	34.8	34.9	34.9	34.9
NAL6	Overscaig House	24.3	29.7	33.8	34.4	34.4	34.5	34.6	34.6	34.6
NAL7	Overscaig Bungalow	23.9	29.3	33.4	34.0	34.0	34.1	34.1	34.1	34.1

11.105 **Table 11.16** shows that total immission levels based on consented levels exceed 35dB(A) at two locations, NAL2 and NAL3. Maximum cumulative immission levels, based on consented levels, of 36.3dB(A) are shown at NAL 2 for windspeeds greater than 9m/s.

11.106 If the cumulative daytime limits were to reference a lower limit of 35dB(A), exceedances would be shown at NAL2 and NAL3 at 6-7m/s. This is shown below in **Table 11.17**.

Table 11.17: Exceedance of daytime cumulative limits with a 35dB(A) lower fixed limit

L90	dB(A)	V10 wind speed (ms ⁻¹)								
Location	Name	4	5	6	7	8	9	10	11	12
NAL2	East Overscaig	-8.6	-3.2	0.9	1.2	-1.8	-5.9	-11.6	-11.6	-11.6
NAL3	Carrachin, Loch Shin	-8.9	-3.5	0.6	0.9	-2.1	-6.2	-11.8	-11.8	-11.8

11.107 As presented in Section 11.82, ETSU-R-97 provides the ability to set the lower limit within the 35-40dB(A) range provided justification is presented. In the case of the Proposed Development, it has been presented and discussed that a cumulative lower limit of 36.5dB(A) would be fair to allow the development to operate without extensive mitigation but still maintaining minimal impact on residential amenity.

11.108 **Table 11.18** and **Table 11.19** demonstrate the level of exceedance with the proposed cumulative limits for day and night, respectively.

Table 11.18 Daytime Exceedance of proposed cumulative limits

L90	dB(A)	V10 wind speed (ms ⁻¹)								
Location	Name	4	5	6	7	8	9	10	11	12
NAL1	Fiag Lodge	-15.3	-10.1	-6.3	-5.8	-5.6	-5.4	-5.2	-5.2	-5.2
NAL2	East Overscaig	-10.1	-4.7	-0.6	0.0	-1.8	-5.9	-11.6	-11.6	-11.6
NAL3	Carrachin, Loch Shin	-10.4	-5.0	-0.9	-0.3	-2.1	-6.2	-11.8	-11.8	-11.8
NAL4	Oak Lodge	-11.7	-6.3	-2.2	-1.6	-3.4	-7.5	-13.1	-13.1	-13.1
NAL5	Overscaig Hotel	-11.8	-6.5	-2.4	-1.8	-3.5	-7.7	-13.3	-13.3	-13.3
NAL6	Overscaig House	-12.2	-6.8	-2.7	-2.1	-3.9	-8.0	-13.6	-13.6	-13.6
NAL7	Overscaig Bungalow	-12.6	-7.2	-3.1	-2.5	-4.3	-8.4	-14.1	-14.1	-14.1

Table 11.19 Night-time Exceedance of proposed cumulative limits

L90	dB(A)	V10 wind speed (ms ⁻¹)								
Location	Name	4	5	6	7	8	9	10	11	12
NAL1	Fiag Lodge	-16.2	-11.1	-7.3	-6.8	-6.6	-6.4	-6.2	-6.2	-6.2
NAL2	East Overscaig	-11.9	-6.5	-2.4	-1.8	-4.8	-8.0	-11.2	-14.0	-16.0
NAL3	Carrachin, Loch Shin	-12.2	-6.8	-2.7	-2.1	-5.0	-8.3	-11.4	-14.2	-16.2
NAL4	Oak Lodge	-13.5	-8.1	-4.0	-3.4	-6.3	-9.6	-12.7	-15.5	-17.5
NAL5	Overscaig Hotel	-13.6	-8.3	-4.1	-3.6	-6.5	-9.8	-12.9	-15.7	-17.7
NAL6	Overscaig House	-14.0	-8.5	-4.4	-3.8	-6.8	-10.1	-13.2	-16.0	-18.0
NAL7	Overscaig Bungalow	-14.4	-9.0	-4.9	-4.3	-7.2	-10.5	-13.6	-16.4	-18.4

11.109 All assessment locations are shown to comply with the cumulative limits by a minimum margin of 0dB for NAL2 at 7m/s during daytime periods.

11.110 Should the proposed development be consented, it has been shown that an apportioned limit based on predictions plus a 1dB margin of headroom would allow the Proposed Development to comply cumulatively with the proposed limits. These limits have been tabulated and shown in **Technical Appendix 11.5**.

Residual Effects

Operation

11.111 A cumulative noise impact assessment has been conducted which included predicted noise immissions from one wind development in the study area in addition to the Project. Total predicted cumulative noise immissions were shown to remain below 35dB(A), with a level change of 2.2dB from baseline levels.

- 11.112 When considering consented levels, maximum cumulative levels of 36.6dB(A) were shown. This is considered to be a modest level relative to the 108 MW of generation it represents.

Summary

- 11.113 Using the preceding baseline data, a noise modelling exercise was undertaken to assess potential impacts from the proposed development.
- 11.114 The operational noise assessment was carried out to assess potential impacts that may arise from the Proposed Development in isolation. Predicted immission from the proposed turbines were found to be below 31dB(A) at all assessment locations, with a maximum predicted level of 30.6dB(A), at NAL2 (East Overscaig). This resulted in a minimum compliance margin of 4.4dB with the simplified ETSU-R-97 limit of 35dB(A). This suggests that noise impacts would be **negligible** and **not significant**.
- 11.115 A cumulative assessment was conducted with predicted noise levels from both Sallachy Wind Farm and the Project, which demonstrated total predicted immission levels would increase by approximately 2dB over baseline levels, during worst-case downwind propagation, but remain below 35dB(A). When assessing consented levels, the derived cumulative limits would be complied with at all locations. The residual effect was assessed to be negligible as the expected change in level is minimal and the expected immission levels would be lower due to directivity during the most common wind directions for the area.

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Coille Linne Wind Farm

Environmental Impact Assessment Report Volume 1 Chapter 12: Traffic and Transport

May 2025

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Table 12.8: Average Daily Traffic Flows (2029)
Table 12.9: Receptor Sensitivity Summary
Table 12.10: Turbine Components
Table 12.11: Steel Reinforcement Deliveries
Table 12.12: Track Material Deliveries
Table 12.13: Cable Trip Estimate
Table 12.14: Cable Sand Trip Estimate
Table 12.15: Construction Traffic Profile (two-way trips)
Table 12.16: Peak Construction Traffic
Table 12.17: Traffic Impact Summary
Table 12.18: 2029 Daily Traffic (12hr) Capacity Review Summary

Table 12.19: Overall Construction Phase Effects Assessment

Table 12.20: Combined Scheme Sensitivity Review Peak Traffic Summary

Table 12.21: Combined Scheme Sensitivity Review Peak Traffic Summary

Table 12.22: Summary of Residual Effects

12 TRAFFIC AND TRANSPORT

Introduction

- 12.1 This chapter considers the potential effects of Coille Linne Wind Farm (the 'proposed development') on receptors along the transport routes as a result of construction traffic and Abnormal Indivisible Load (AIL) vehicle movements associated with the construction of the proposed development. The specific objectives of the chapter are to:
- Review the relevant policy and legislative framework;
 - Describe the transport baseline conditions;
 - Describe the assessment methodology and significance criteria used in completing the impact assessment;
 - Describe the potential effects, including direct, indirect and cumulative effects;
 - Describe the mitigation measures proposed to address likely significant effects; and
 - Assess the residual effects remaining following the implementation of mitigation.
- 12.2 A high-level overview of the effects of the traffic movements has been considered in accordance with Institute of Environmental Assessment (now Institute of Environmental Management and Assessment (IEMA)) Guidelines for the Environmental Assessment of Road Traffic. The document is referred to as the IEMA Guidelines in this chapter.
- 12.3 This chapter is also supported by the following figures as contained within **Volume 2: Figures**:
- Figure 12.1: Study Area;
 - Figure 12.2: Traffic Count Locations;
 - Figure 12.3: Personal Injury Accident Locations; and
 - Figure 12.4: Construction Traffic and AIL Delivery Route Plan.
- 12.4 The chapter is supported by a number of Technical Appendices (as set out within **Volume 4: Technical Appendices**), comprising:
- Technical Appendix 12.1: AIL Route Survey (Prepared by Collett) and
 - Technical Appendix 12.2: Site Access Junction Layout.
- 12.5 This assessment is based on the proposed development which comprises up to 15 turbines with a maximum tip height of 250 metres (m) and operational life of 35 years, as described in **Chapter 3: Project Description**.
- 12.6 The author of this chapter is Elaine Moran BEng (Hons), MSc, MCIHT, who is a Senior Transport Planner at Pell Frischmann. She has nine years of experience in the traffic and transport planning industry.

- 12.7 The technical reviewer of the traffic and transport assessment is Gordon Buchan BEng (Hons), MSc, CEng, CMILT, FCIHT, Sector Director at Pell Frischmann. He has over 27 years of experience in undertaking transport assessments associated with new developments and has worked on renewable energy and energy distribution projects across the UK, Ireland and Northern Europe.

Legislation, Policy and Guidance

Legislation

- 12.8 There is no legislation, which is specific to transport assessments, which is required to be considered as part of this assessment.

Policy

- 12.9 **Chapter 5: Renewable Energy and Planning Policy** of the EIA Report sets out the planning policy framework that is relevant to the EIA process and the proposed development. The policies set out include those from the Highland-wide Local Development Plan (LDP) (2012)) and relevant aspects of NPF4 (National Planning Framework 4) (2023)
- LDP's Policy 56 relates to Travel and notes that a development proposal that results in travel generation must include sufficient information with the application to allow the Council to consider any onsite and offsite transport implications.
 - NPF4's Policy 11 relates to Energy and makes specific reference to the how project design and mitigation will address the impacts of construction traffic on the road network associated with renewable energy projects.
- 12.10 This assessment undertaken as part of this EIA Report has taken cognisance of the above policies and has provided appropriate mitigation, where necessary.

Guidance

- 12.11 This assessment has been undertaken in accordance with guidance outlined in the following documents:
- Onshore Wind Turbines Planning Advice (2014);
 - Planning Advice Note (PAN) 75 (2005);
 - Guidance on the Preparation of Transport Assessments (2014); and
 - Transport Assessment Guidance (2012).

Consultation

- 12.12 As part of the Scoping exercise, consultation was undertaken to inform the design of the proposed development and to seek agreement on potential significant environmental effects that result from the proposed development as well as the scope of any assessment work required as part of this EIA.

- 12.13 The Scoping Opinion was received from the Scottish Government Energy Consents Unit / Scottish Ministers on 20 September 2024.
- 12.14 Consultation relevant to the traffic and transport assessment was undertaken with The Highland Council, as local roads agency, and Transport Scotland, as trunk road agency, who commented on aspects of methodology, sources of information, scope of assessment and cumulative development. The British Horse Society also provided a scoping response. A summary of these consultation responses is provided in **Table 12.1**.

Table 12.1: Consultation Responses

Consultee	Date Received	Consultation Response	Where and how is this addressed?
The Scottish Government Energy Consents Unit	20 September 2024	Transport – abnormal loads The Scottish Ministers recommend that the Company discuss and agree the scope of the Abnormal Loads Assessment with Transport Scotland prior to it being undertaken.	The assessment of abnormal loads along the proposed delivery route is presented in Technical Appendix 12.1. Any proposed works would be confirmed post consent with appropriate reviews and BE16 applications made at the time.
		Transport – construction traffic management plan. The Scottish Ministers recommend that the Company discuss and agree the scope of the construction traffic management plan with the Highland Council and Transport Scotland. Local communities which will be impacted by the proposed Development's construction traffic should also be involved in such discussions. With regards to the assessment of traffic and transport, it should be noted by the Company that the Environmental Assessment of Traffic and Movement (2023) guidelines have replaced the Environmental Assessment of Road Traffic (IEMA) (1993) guidelines.	A detailed Construction Traffic Management Plan (CTMP) will be provided post-consent and will be secured through an appropriately worded planning condition. Relevant stakeholders will be consulted during the preparation of the CTMP. Noted.
The Highland Council Transport Planning Team	15 th of August 2024	Traffic and Transport Transport Planning Team have reviewed the transport related information submitted in chapter 12 of the Environmental Impact Assessment Scoping Report dated June 2024 which sets out how the traffic impacts of the development will be assessed and mitigated. The information provided in chapter 12 is extremely limited therefore as more	Detailed roads information is

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		detailed roads related information on the proposed development becomes available, it is highly likely that additional issues related to roads, structures and mitigation are likely to be raised by the Transport Planning Team.	provided in the Baseline section of this chapter. The Applicant is willing to enter into a formal Wear & Tear agreement. This will form a suitably worded planning condition. The Applicant will consult with the appropriate roads and structures teams to agree any proposed mitigation measures along the AIL component delivery route. Any proposed works to facilitate the delivery of turbine components would be confirmed post consent with appropriate reviews and BE16 applications made at the time.
		Attached at the end of this response is the Council's Renewable Energy Transport Assessment Guidance which details the issues that must be addressed within the subsequent detailed Transport Assessment (TA) or section on traffic and transportation within the Environmental Impact Assessment (EIA) Report for the project that must be prepared by the applicant.	Noted.
		Baseline Conditions This section of the EIA discusses the potential port of entry, construction routes and available traffic data. However, the chapter contradicts itself saying that the port of entry will be Nigg (12.2 and 12.13) but also states that the port of entry will be Invergordon (12.6). The proposed routes for construction and abnormal loads is also very confused proposing that traffic travels north to Brora and then returns south to the A839. It is clear that the applicant is at an early stage with regards to the proposals and clarification is required regarding the	It is proposed that turbine components will be delivered to the Site from the Port of Entry (PoE) which is anticipated to be either the Port of Invergordon or the Port of Nigg. Details of the proposed delivery route from the PoE to the Site is outlined in Technical Appendix 12.1.

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		Study Area, port of entry and construction routes.	
		The Study Area must also include the construction routes on Council maintained roads from the port of entry to the Trunk Road network.	Details of the extent of the study area is provided in the study area section of this chapter.
		This section states that there is a DfT count site on the A836 north of Lairg that has data from a manual count taken in 2022. However, the 2022 data is estimated from a manual count in 2009 and is therefore extremely out of date. The Council may have more up to date traffic data, and we recommend the applicant seeks clarity from Grzegorz.otreba@highland.gov.uk.	A request was sent to THC seeking recent Annual Average Daily Flow (AADF) data for local road links within the study area, however no response has been received. As such, the traffic data within the local road network has been sourced from the DfT database.
		The applicant must also specify the growth factor that will be applied to forecast future traffic flows from the National Road Traffic Forecast.	Noted. National Road Traffic Forecast (NRTF) growth factors are provided within the chapter, where appropriate.
		Likely Significant Effects During Construction The applicant states that a Swept Path Report for the carriage of abnormal loads has been carried out, but this has not been submitted for review. We note the requirement for third party land to facilitate the movement of abnormal loads.	Technical Appendix 12.1 shows the swept path analysis of pinch points along the proposed ALL delivery route.
		The junction into the site from the public road must be designed as per the standards set out in the Council guidance document 'Roads and Transport Guidelines for New Developments' including the required visibility splays, junction radii, surfacing and drainage measures.	An indicative layout of the Site Access Junction is provided in Technical Appendix 12.2 .
		The acknowledgement that the impact of traffic for the removal of timber and the import of construction materials such as cabling and aggregates will be considered is welcomed. Any future assessment must ensure that routes for timber transport take cognisance of the requirements set out in the Timber Transport Route Map and consider routes	Noted. Assumptions on the origin of construction materials and the destination of the timber exports are detailed in the Distribution of Construction Trips section of this

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		to the site from local quarries and other material sources.	chapter. However, it should be noted that at this stage of the project only assumptions can be made as the Balance of Plant (BoP) contractor has not yet been appointed.
		We note the proposal to use the methodology set out in the Environmental Assessment of Traffic Movement (IEMA 2023) to assess the impact of traffic associated with this development. Whilst we recognise the importance of the environmental impacts, this methodology does not include any requirement to assess the condition of the existing local public road network and its capability to physically and safely accommodate the predicted traffic impacts whilst remaining safe for other road users.	A road condition survey will be undertaken prior to construction of the proposed development which will be secured through an appropriately worded planning condition. Any deterioration resulting from traffic associated with the proposed development will be fixed, in agreement with the appropriate roads authority.
		Regarding quantifying the scale of traffic impacts we will require any single-track roads with passing places to be identified as high sensitivity as defined by Rule 2 in the IEMA methodology. This reflects the sensitivity of such routes in the volume and nature of traffic that currently uses them.	Note, the A838 is assessed within the chapter by Rule 2.
		Many Council owned and maintained roads such as the A838 and other single track A roads are not designed roads and are therefore extremely vulnerable to damage by construction traffic and abnormal loads. The A838 (and others like it) is substandard in terms of construction and geometry being an evolved road rather than designed to modern day standards. It is highly likely that extensive mitigation works will be required on the A838 to support construction traffic to the proposed development. The required mitigation may include but not be limited to new or improved infrastructure such as road widening and edge strengthening, junction and forward visibility improvements and new or improved passing places.	The assessment of abnormal loads along the proposed delivery route is presented in Technical Appendix 12.1 . Any proposed works to facilitate the delivery vehicles and the delivery of turbine components would be confirmed post consent with appropriate reviews and BE16 applications made at the time.

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		Likely Significant Effects During Operation The chapter states that operational traffic will not be included in the scope of the EIA. Although the Transport Planning Team have no objection to this approach, we would advise that should permission be granted, we will recommend a condition requiring notification and approval of the planning authority in consultation with the respective roads' authorities and communities for any significant HGV or abnormal load movements required during the lifespan or decommissioning of the windfarm.	Agreed. This will be secured through an appropriately worded planning condition.
		Design and Mitigation The Transport Planning Team disagree with the statement that 'there are no known design or mitigation that would prevent potential significant effects at this stage in the project.' As advised, the construction routes to this site include single track roads and they should be regarded as receptors due to their fragile nature and unsuitability for the levels of construction traffic associated with this development. Although it is not clear at this stage exactly what roads must be included in the study area, it is known that the A838 is particularly vulnerable. Promoters of similar projects in the area have been advised that the Transport Planning Team will not support any development that takes access from the A838 without significant mitigation works on the road.	Technical Appendix 12.1 outlines mitigation measures along the proposed AIL delivery route (including the A838) to facilitate the delivery of AIL components. A condition survey will be undertaken on the A838 within the Study Area. It is proposed that this will form a planning condition should planning permission be granted. Details of proposed condition survey are outlined in Para 12.143.
		The commitment to prepare a Traffic Management Plan to control and manage construction traffic is welcomed, but this must be in addition to mitigation measures to support the volume of HGVs associated with this development as well as abnormal loads.	Noted. A detailed CTMP and an AIL TMP will be provided post-consent and will be secured through an appropriately worded planning condition. An outline CTMP and TMP are provided as part of this chapter.
		Inclusion or Exclusion from the EIA Report As previously stated, we note the proposal to scope out operational traffic, but the Transport Planning Team will require a condition to be applied to any consent	It is estimated that there will be approximately two

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		given for the approval of any significant HGV movements or abnormal load requirements during the lifespan of the windfarm.	vehicles accessing the proposed development during the operational phase. In the extraordinary circumstance that any significant Heavy Goods Vehicle (HGV) movements or ALL requirements during the lifespan of the windfarm, this would be agreed with The Highland Council (THC).
		Proposed Scope of Assessment The Transport Planning Team welcome the applicants' agreement to discuss the scope of the required Transport Assessment (TA). Prior to the preparation of the TA, the developer should first carry out a detailed scoping exercise in consultation with the Council and Transport Scotland to ensure that all roads affected by construction traffic and abnormal loads are included in the Study Area. The attached guidance at the end of this response provides further information on the required content of the TA. Further information and guidance can also be found in Chapter 9 and Appendix 9 of the Council document 'Roads and Transport Guidelines for New Developments' which is available on the Council website.	Scoping has been undertaken through the scoping report. This chapter has been prepared in line with THC's Roads and Transport Guidelines for New Developments.'
		A swept path assessment for abnormal loads on the preferred route from the port of entry must be undertaken and consider any structures along the route. A trial run to demonstrate the suitability of the route will also be required.	A trial run will be undertaken post consent and prior to the construction of the proposed development. This will be secured through an appropriately worded planning condition.
		The TA must also include information on the impact of construction traffic and abnormal loads on the Council's structures. It is likely that there are structures on access routes that have not been assessed for abnormal loads and some structures may not be suitable for	As noted earlier in this table, the Applicant will consult with the appropriate roads and structures teams to agree any proposed mitigation measures along the ALL component

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		the increased intensity of HGV loadings either.	delivery route. Any proposed works to facilitate the delivery of turbine components would be confirmed post consent with appropriate reviews and BE16 applications made at the time.
		It is recommended that the applicant consults as early as possible the Council's Structures and Abnormal Loads Teams regarding affected Council maintained structures and restricted routes: • structures@highland.gov.uk • abnormal.loads@highland.gov.uk The Transport Planning Team are aware that there are currently issues with the Tirry Bridge on the A838 and it is unlikely to be able to convey abnormal loads in its current condition.	Please see above response. It should also be noted that the Applicant has consulted THC's Abnormal Loads Department and they have advised to get in touch with other developers who are further along in the planning process. The Applicant has done this and is engaging with them.
		The content of the TA and design of mitigation measures must also be undertaken in accordance with the following standards: • Transport Scotland – Transport Assessment Guidance • The Highland Council – Roads and Transport Guidelines for New Developments	Noted. This chapter has been prepared in accordance with these guidelines.
		The capacity of Council maintained roads is not an issue however as already stressed, the physical ability of many of the fragile, lifeline roads in the area to accommodate construction traffic safely is a major issue. Therefore, we disagree with the statement that the capacity of the road network should be regarded as way of assessing the sensitivity of the roads as receptors. The sensitivity of the 'receptor' or 'road' should be assessed with regards to the roads' ability to convey construction traffic in terms of its structural capacity, geometry, and the safety of other road users such as pedestrians, cyclists and the local communities along construction traffic routes.	The sensitivity of the road network will be assessed in line with IEMA guidelines as noted in Table 12.2 .

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		We note that it is proposed to include cumulative traffic impacts associated with other developments in the area. The applicant should seek clarity from the Planning Service with regards to committed development.	A search of the ECU and THC planning portals was undertaken to determine the committed developments to be considered within the assessment.
		Other Issues not covered within Chapter 12 Grid Connection Works - Should related grid connection and/or substation works be likely to impact on any of the local roads forming the access routes to the site, it would be desirable to consider the impact of these works, and the mitigation required in conjunction with the proposed windfarm and BESS.	This will form part of a separate planning application.
		Battery Energy Storage System (BESS) - with regards to the proposal for a BESS, it is our understanding that specific Scottish guidance is being prepared in relation to their design. Until this guidance is available, the applicant should refer to the National Fire Chiefs Council guidance on Grid Scale Battery Energy Storage with regards to the design of the access to the site.	Noted.
		Maintenance Agreement and Bond – Notwithstanding the above requirements, there will remain a risk of damage to Council maintained roads from development traffic. In order to protect the interests of the Council as roads authority, a suitable agreement relating to Section 96 of the Roads (Scotland) Act and appropriate planning legislation – including the provision of an appropriate Road Bond or similar security will therefore be required	The Applicant is willing to enter into a formal Wear & Tear agreement. This will form a suitably worded planning condition
		A Transport Assessment (TA), Construction Traffic Management Plan (CTMP) and an Abnormal Load Assessment will be required within the EIAR. The Transport Assessment Methodology below sets out what the Council requires, and further information is provided in our published Roads and Transport Guidelines for New Developments. When establishing a scope for the assessment consideration should be given to the use of the public roads in this area can be influenced significantly by tourist traffic.	Details generally contained within a Transport Assessment (TA) are provided as part of this chapter, as well as an outline CTMP. An AIL Route Survey Report is provided as Technical Appendix 12.1 . Annual Average Daily Traffic (AADT) is from the Department for Transport (DfT) and

Consultee	Date Received	Consultation Response	Where and how is this addressed?
			Transport Scotland (TS) databases which capture tourist traffic volumes.
		Transport Assessment Methodology Transport Planning would expect a Transport Assessment to be submitted with any future planning application and a High National Traffic Forecast be applied. The information below is not exhaustive and should be used as a guide to submitting all relevant information in relation to roads, traffic and transportation matters arising from the development proposals.	As noted above, details generally contained within a TA are presented as part of this chapter. An NRTF high growth factor has been applied to the local road network. Further details are presented within the chapter.
		1. Identify all public roads affected by the development. In addition to transportation of all abnormal loads & vehicles (delivery of components) this should also include routes to be used by local suppliers and staff. It is expected that the developer submits a preferred access route for the development. All other access route options should be provided, having been investigated in order to establish their feasibility. This should clearly identify the pros and cons of all the route options and therefore provide a logical selection process to arrive at a preferred route.	Details of the study area and the assumed distribution of construction trips are outlined within the chapter.
		2. Establish current condition of the roads. This work which should be undertaken by a consulting engineer acceptable to the Council and will involve an engineering appraisal of the routes including the following: - assessment of structural strength of carriageway including construction depths and road formation where this is likely to be significant in respect of proposed impacts, including non-destructive testing and sampling as required; - road surface condition and profile; - assessment of structures and any weight restrictions; - road widths, vertical and horizontal alignment and provision of passing places; and - details of adjacent communities.	A condition survey will be undertaken post consent and before construction and is expected to form a suitably worded planning condition.
		3. Determine the traffic generation and distribution of the proposals throughout	This is provided in the chapter.

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		the construction and operation periods to provide accurate data resulting from the proposed development including: • nos. of light and heavy vehicles including staff travel; • abnormal loads; and • duration of works.	
		4. Current traffic flows including use by public transport services, school buses, refuse vehicles, commercial users, pedestrians, cyclists and equestrians.	The baseline traffic flows are based on AADT traffic flows from the DfT and TS Databases which capture the public transport services, school buses, refuse vehicles and commercial users. Details of active travel network are provided within the chapter.
		5. Impacts of proposed traffic including: • impacts on carriageway, structures, verges etc.; • impacts on other road users; • impacts on adjacent communities; • swept path and gradient analysis where it is envisaged that transportation of traffic could be problematic; and • provision of Trial Runs to be carried out in order to prove the route is achievable and/or to establish the extent of works required to facilitate transportation.	Impacts on the roads, road users and local communities has been assessed in line with IEMA Guidelines. Swept path analysis has been undertaken for the delivery of AILs and is presented in Technical Appendix 12.1. Trial runs will be secured by a suitably worded planning condition.
		6. Cumulative impacts with other developments in progress and committed developments including other Renewable Energy projects.	Cumulative impacts have been reviewed as part of this chapter.
		7. Proposed mitigation measures to address impacts identified in 5 above, including: • carriageway strengthening; • strengthening of bridges and culverts; • carriageway widening and/or edge strengthening; • provision of passing places;	Proposed mitigation measures to facilitate the delivery of AIL components are provided in Technical Appendix 12.1. A condition survey will be undertaken

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		- road safety measures; and - traffic management including measures to be taken to ensure that development traffic does not use routes other than the approved routes.	post consent and before construction and is expected to form a suitably worded planning condition. Passing places are located along the length of the A838. It is proposed that a review of the passing places will be reviewed post consent with THC. A CTMP will contain proposed road safety measures and traffic management measures. These are further outlined in the Mitigation Measures and Monitoring section of this chapter.
		Details of residual effects.	Details of residual effects are included in this chapter.
		Abnormal Load Assessment The TA should include an Abnormal Load Assessment of the roads utilised to convey abnormal loads to the site. The assessment will need to confirm the proposed port of entry for ALL components and justify the adequacy of the route for transporting them to the site. Early discussion with the Council's abnormal loads team (the contact is Greg Otreba Grzegorz.Otreba@highland.gov.uk and the Council's structures team (the contact is Norman Smart Norman.Smart@highland.gov.uk is recommended.	The PoE is anticipated to be either the Port of Invergordon or the Port of Nigg. Technical Appendix 12.1 outlines mitigation measures along the proposed ALL delivery route to facilitate the delivery of ALL components.
		Construction Traffic Management Plan THC Transport Planning will require any application for planning permission associated with this proposal to submit a CTMP for the approval of the Planning Authority. A CTMP will normally detail the following issues, however this is not an exhaustive list and the CTMP should be	An outline CTMP is provided as part of this chapter. A detailed CTMP will be secured via an appropriately worded planning condition.

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		tailored to reflect the issues pertinent to this development: • Identification of all Council maintained roads likely to be affected by the various stages of the development, • Predicted volume, type and duration of construction traffic. • Location of site compound, staff parking and visitor parking. • Proposed measures to mitigate the impact of general construction traffic and abnormal loads on the local road network following detailed assessment of relevant roads. • Details of any traffic management signage required for the duration of the construction period. • Measures to ensure that all affected public roads are kept free of mud and debris arising from the development. • The developer may also be requested to enter into a Section 96 agreement with the Highland Council to cover any abnormal wear and tear to the Council roads. This will include a requirement for pre and post construction surveys to be undertaken and agreed with the Council and for the provision of a suitable bond.	A Section 96 agreement will form an appropriately worded planning condition.
		If the development involves any abnormal loads a detailed protocol, route and delivery programme will be required and agreed with any interested parties such as Highland Council, the Police, Transport Scotland, and community representatives. The protocol shall identify any requirement for convoy working and/or escorting of vehicles and include arrangements to provide advance notice of abnormal load movements in the local media.	Noted.
		Detailed Junction Design Details of any new site access should be clearly set out on dimensioned drawings related to OS data and include confirmation of geometry, construction form, drainage details to prevent water running out onto the public road and evidence that appropriate visibility splays can be achieved. Vehicle swept paths	An indicative layout of the Site Access Junction is provided in Technical Appendix 12.2.

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		should also be provided to evidence that the proposed junction form will be suitable for its intended use. Details of reinstatement of any temporary site access at its junction with the public road, post construction is also required. Appropriate junction arrangements and visibility splay information can be found in THC's published Roads and Transport Guidelines for New Developments.	
		Transport Planning have provided comments on the transport related information submitted in the Scoping Report including the scope of the assessment and their requirements for supporting information in their consultation response.	Noted.
The British Horse Society Scotland	7 August 2024	Outdoor Access Access to safe off-road riding routes is vital to the health and wellbeing of horses and their riders. Under the terms of the Land Reform (Scotland) Act 2003, equestrians have the same rights of access to the outdoors as other non-motorised users, such as pedestrians and cyclists. Equestrian use should therefore be included when planning and designing wind farm proposals. Considering all access takers, including equestrians, in the early stages helps to avoid problems down the line and ensures that projects like this are an opportunity to preserve and improve access for all, rather than curtail it or restrict it to certain groups.	Noted. Equestrian users have been considered in this assessment in similar terms to pedestrians and cyclists.
Transport Scotland	08 August 2024	Assessment of Environmental Impacts The Scoping Report presents the proposed methodology for the assessment of Traffic and Transport. This states that the assessment will be carried out in accordance with the 'Guidelines for the Environmental Assessment of Road Traffic' (IEMA) (1993). Transport Scotland would note that new guidance has been published by the Institute of Environmental Management and Assessment (IEMA). These Guidelines, entitled Environmental Assessment of Traffic and Movement (July 2023), are intended to update and replace the previous 1993 IEMA guidelines and provide enhanced and up to date advice on the assessment of traffic and movement. We would, therefore, request that the thresholds as indicated within these new guidelines be used as a screening process	Noted.

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		for the assessment. These specify that road links should be taken forward for further assessment where the following two rules are breached: Rule 1: Include road links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%) Rule 2: Include road links of high sensitivity where traffic flows have increased by 10% or more.	
		We note that the study area has been identified within the SR as "the main route between Nigg and Fiag". However, the SR also states that the Port of Entry for turbine components is the Port of Invergordon. Transport Scotland would, therefore, suggest that the Study Area should encompass the surrounding road network proposed to be utilised during construction. In particular, we would state that as the A9(T) will be utilised by both construction-related traffic and the transportation of turbine components, a threshold assessment of the potential traffic impact on the A9(T) will require to be provided as a minimum and an assessment of potential environmental effects undertaken of the above thresholds are exceeded.	The PoE is anticipated to be either the Port of Invergordon or the Port of Nigg. The proposed ALL delivery route will be via the A9, A839, A836 and A838, with loads passing through The Mound, Rogart and Lairg.
		With regards to base traffic, the SR states that the closest publicly available traffic count data is a location on the A836, north-west of Lairg. Transport Scotland would state that annual average daily traffic (AADT) base traffic for the full study area should be obtained, and that a source of traffic data is Traffic Scotland's National Traffic Data System. In addition, the Department for Transport (DfT) Road Traffic Statistics site may be utilised, but we would ask that "estimated" data from the DfT site is not used.	Available TS traffic data has been used as baseline flows along the trunk network. Further details of the count points used are outlined in the Baseline section of this chapter.
		We would also state that base traffic will require to be factored to the peak construction year using National Road Traffic Forecasts (NRTF) Low Growth.	Noted. NRTF low growth factors will be used to estimate future year growth on the trunk road.
		It is noted that any impacts associated with the operational and decommissioning phases of the development are to be scoped out of the EIA. We would consider this to be acceptable in this instance.	Noted.
		Abnormal Loads Assessment	

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		The SR indicates that the expected Port of Entry for turbine components is the Port of Invergordon, with deliveries made via the following route: From the Port of Invergordon to the A9(T); • The A9(T) from Alness in the south to Brora in the north; • The A836 between the Dornoch Firth Bridge and Lairg; • The A839 between Lairg and the A9(T); • The A836 between Lairg and Colaboll • The A838 between Colaboll and Site	The POE is anticipated to be either the Port of Invergordon or the Port of Nigg. Technical Appendix 12.1 outlines the proposed AIL delivery route of AIL components.
		The SR states that an Abnormal Loads Assessment (ALA) will be prepared. We would state that Transport Scotland will require to be satisfied that the size of loads proposed can negotiate the selected route and that their transportation will not have any detrimental effect on structures within the trunk road route path.	The abnormal loads assessment is presented in Technical Appendix 12.1.
		The ALA should, therefore, identify key pinch points on the trunk road network. Swept path analysis should be undertaken and details provided with regard to any required changes to street furniture or structures along the route.	Technical Appendix 12.1 contains swept path drawings at pinch points along the proposed AIL delivery route.

Assessment Methodology and Significance

Scope of Assessment

Effects Assessed in Full

- 12.15 The following effects were considered to be potentially significant in relation to traffic and transport at the scoping stage and have been assessed in full within this chapter:
- Direct effects during construction on traffic flows in the surrounding study area;
 - Direct effects upon local road users; and
 - Effects upon local residents due to an increase in construction traffic.
- 12.16 Where the effects meet the criteria set out in the IEMA guidance, a review of the effects on severance, driver delay, pedestrian delay, non-motorised user amenity, fear and intimidation, road safety, road safety audits and large loads has been undertaken.

Effects Scoped Out

Operational Effects

- 12.17 *The traffic effects during the operational phase of the proposed development are likely to be insignificant as expected traffic flows will be less than two vehicle movements per week, far below the recognised thresholds for triggering a formal transport assessment. As such, the effects during operational phase are scoped out of the assessment.*

Decommissioning Effects

- 12.18 *The traffic effects during the decommissioning phase can only be fully assessed closer to that period, 35 years on from the completion of the Site. As elements of the development are likely to remain in-situ (such as cable trenches, access tracks, etc), the traffic flows associated with the decommissioning works will be lower than those associated with the construction phase. The construction phase therefore represents a worst-case assessment and as such, no further assessment of the decommissioning phase has been considered at this point in time and has been scoped out of the assessment.*

Cumulative Effects

- 12.19 A review of online planning applications identifies there are a number of consented / under construction onshore wind farm developments in the planning system which would use the same access route as that intended to be used for the proposed development.
- 12.20 TA guidance advises that only those projects with extant planning permission or local development plan allocations within an adopted or approved plan require to be included in any assessment. Those projects in scoping or not yet determined should not be included in cumulative assessments as they have yet to be determined. When considering traffic impacts specifically in relation to the construction phase of a project, the potential traffic impact is highly speculative and as such, cannot be included in the assessment.

Local Wind Farms

- 12.21 The details of these significant applications are detailed below with their current status in **Table 12.2**.

Table 12.2: Cumulative Development Summary

Reference	Wind Farm	Distance	No. of turbines	Current Status
20/05067/FUL	Strath Tirry	≈ 10km	4	Consented
22/01635/S36	Chleansaid	≈ 10km	16	Consented
21/01615/FUL	Sallachy	< 10km	9	Consented
21/03695/S36	Achany Extension	< 20km	20	Consented
23/02936/S36	Creag Riabhach Extension	≈ 10km	3	Consented
21/00849/FUL	Lairg II Re-Design	< 25km	10	Consented

Reference	Wind Farm	Distance	No. of turbines	Current Status
20/02659/FUL	Meall Buidhe	< 25km	8	Consented
22/02442/FUL	Strathrory Re-Design	< 50km	7	Consented

- 12.22 Strath Tirry Wind Farm was granted planning consent in June 2022. The decision notice states that construction of Strath Tirry Wind Farm must commence within three years of the date of the decision notice. Planning application documents note that the construction period will be approximately 12 months in duration and as such it can be reasonably assumed that Strath Tirry Wind Farm will be operational before the construction phase of the proposed development begins in 2029. As such, this will not be included as part of any cumulative assessment.
- 12.23 Chleansaid Wind Farm was granted planning permission in December 2023 and includes a condition that construction must commence within three years of the date of the decision notice. It is noted on Chleansaid Wind Farm's webpage¹ outlines that the earliest date for construction is in 2025. From reviewing the online planning documents, it is anticipated that construction will take place over 21 months. It is therefore reasonable to assume that Chleansaid Wind Farm will be operational prior to the commencement of construction activities associated with the proposed development in 2029. As such, this will not be included as part of any cumulative assessment.
- 12.24 From reviewing Sallachy Wind Farm's project webpage² it is anticipated that construction will commence in 2026 and grid connection will take place in 2028. It is therefore reasonable to assume that Sallachy Wind Farm will be operational prior to the start of construction activities associated with the proposed development in 2029. As such, this will not be included as part of any cumulative assessment.
- 12.25 Achany Wind Farm Extension was granted planning permission in May 2023. A condition has been imposed that the development must commence within five years of this date. From the associated TA located on THC's planning portal, it is anticipated that the construction period will be 18 months. A combined sensitivity assessment has been undertaken, including Achany Wind Farm Extension, further in this chapter as part of the cumulative assessment to inform the local authorities of potential increase in construction related traffic, should there be an overlap in construction phases.
- 12.26 Creag Riabhach Wind Farm Extension was granted planning permission in July 2024 and contains a condition that construction must commence within three years of the date of the decision notice. The associated TA located on THC's planning portal outlines that the anticipated construction period will be 23 months. Creag Riabhach Wind Farm Extension is therefore included in a combined sensitivity assessment which has been undertaken further in this chapter as part of the cumulative assessment to inform the local authorities of potential increase in construction related traffic, should there be an overlap in construction phases.

¹ <https://www.esbenergy.co.uk/our-story-in-britain/chleansaid-wind-farm>

² <https://sallachywindfarm.co.uk/>

- 12.27 Lairg II Wind Farm Re-Design was granted planning permission in October 2021. A condition was imposed that the construction of the development must begin within three years of the date of the decision notice. A further planning permission was granted in October 2022 which requires construction on the development to have commenced by October 2026. Planning application documents outline that construction would take approximately 12 months and as such would be operational prior to the construction of the proposed development in 2029. As such, this will not be included as part of any cumulative assessment. It should be noted that a screening application (23/02991/SCRE) was submitted in June 2023 for the construction of ten turbines with a total installed capacity exceeding 50MW.
- 12.28 Meall Buidhe Wind Farm was granted planning permission after a successful appeal in June 2023. A condition has been imposed that the development must commence within three years of the appeal decision date. Information obtained from the planning application transport documents note that it was assumed that the construction period was 18 months. As such, it can therefore be reasonably assumed that construction activities associated with Meall Buidhe Wind Farm will be completed prior to the commencement of the construction of the proposed development in 2029.
- 12.29 Strathory Wind Farm Re-Design was granted planning permission after a successful appeal in June 2023. A condition has been imposed that the development must commence within five years of this date. From reviewing online supporting planning documents it is assumed that construction will take place over a 12 month period. A combined sensitivity assessment has been undertaken, including Strathory Wind Farm Re-Design, further in this chapter as part of the cumulative assessment to inform the local authorities of potential increase in construction related traffic, should there be an overlap in construction phases
- 12.30 It should be noted that the construction period of a wind farm development is transitory in nature and all impacts are short lived and temporary. The inclusion of additional traffic flows in the baseline, will dilute the potential impact that the proposed development will have. The approach taken is therefore considered to be a suitably robust assessment.
- 12.31 Should the construction of committed developments take place at the same time as the proposed development, it would be mitigated through the use of an overarching Traffic Management and Monitoring Plan (TMMP) for all of the sites and by introducing a phased delivery plan which would be agreed with the local roads departments and Police Scotland.

Local Committed Developments

- 12.32 The use of low and high NRTF growth factors for background traffic is considered robust for addressing smaller, non-significant traffic generation caused by smaller developments within the study area.
- 12.33 It should be noted that the inclusion of additional traffic trips to the baseline, such as committed development trips, will dilute the potential impact that the proposed development will have on the local road network. As such, the approach taken is considered to be an overly robust assessment.

Study Area

- 12.34 The Site is located approximately 21.9 kilometres (km) north of Lairg and 16km south-east of Altnaharra and covers an area of approximately 661.4 hectares (ha). The Site currently comprises commercial forestry.
- 12.35 The study area is shown in **Figure 12.1** and indicates local roads that are expected to experience increased traffic flows associated with the construction phase of the proposed development. The geographic scope was determined through a review of Ordnance Survey (OS) plans and an assessment of the potential origin locations of construction staff and supply locations for construction materials.
- 12.36 The Site will be accessed via an appropriately designed access junction along the A838 which will facilitate construction traffic, abnormal loads deliveries and ongoing operational access to the proposed development. The access junction will be located at existing forestry access point.
- 12.37 Strategic access to the A838 corridor is available from the A9 trunk road network to the east via the A836 and A839.
- 12.38 Access for construction materials would primarily be from the south via the A838, A836, A839 and A9. Access via the B9176 Struie Road is not considered suitable for bulk material deliveries due to the sinuous nature of the road and the natural constraints at the Allt Fearn Burn bridge, Strathrory River bridge and bends at the River Averon bridge. Bulk construction traffic would be prohibited from this route via the BoP contract as the Applicant does not consider the road suitable for articulated HGV deliveries, where alternatives routes such as the A9 and A839 exist.
- 12.39 AILs associated with the wind turbines will be delivered from the PoE at the Port of Nigg or Invergordon via the A9, A839, A836 and A838, with loads passing through The Mound, Rogart and Lairg.
- 12.40 The AIL Route Survey Report (RSR) is provided in **Technical Appendix 12.1**. This provides further detail of the route that the delivery vehicles will take from the PoE to the Site, as well as detailing constraint points and proposed mitigation measures along the route
- 12.41 The study area for this assessment is as follows:
- The A838 between its junction with the A836 and the proposed Site access junction;
 - The A836 between its junction with the A838 and the A9, Meikle Ferry Roundabout;
 - The A839 between its junction with the A9 The Mound and its junction with the A836 at Lairg;
 - The A939 between Clashmore and Bonar Bridge; and
 - The A9 between Brora and Alness.

Desk Based Study and Data Sources

- 12.42 The desk study included reviews and identification of the following:

- Relevant transport planning policy;
- Accident data;
- Sensitive locations;
- Any other traffic sensitive receptors in the area (core paths, routes, communities, etc.);
- OS plans;
- Potential origin locations of construction staff and supply locations for construction materials to inform extent of local area roads network to be included in the assessment; and
- Constraints to the movement of AILs through a Route Survey including swept path assessments.

Field Survey

12.43 No field surveys were undertaken as part of this Traffic and Transport chapter.

Assessment of Significance

12.44 The Institute of Environmental Management and Assessment (IEMA) 'Guidelines for Environmental Impact Assessment' (2005) notes that the separate IEMA Guidelines should be used for characterising the environmental traffic and transport effects (offsite effects) and the assessment of significance of major new developments. More recent guidance published by the IEMA, namely 'Environmental Assessment of Traffic and Movement' (2023) provides an update to the previously used guidance, 'Guidelines for the Environmental Assessment of Road Traffic' (1993) document, which should be used to characterise the environmental traffic and transport effects (offsite effects) and the assessment of significance of major new developments. The guidelines intend to complement professional judgement and the experience of trained assessors.

Sensitivity

- 12.45 In terms of traffic and transport impacts, the receptors are the users of the roads within the study area and the locations through which those roads pass.
- 12.46 The IEMA Guidelines include guidance on how the sensitivity of receptors should be assessed. Using that as a base, professional judgement was used to develop a classification of sensitivity for users based on the characteristics of roads and locations. This is summarised in **Table 12.3**.

Table 12.3: Classification of Receptor Sensitivity

Receptor	Sensitivity			
	High	Medium	Low	Negligible
Users of Roads	Where the road is a minor rural road, not constructed to accommodate	Where the road is a local A or B class road, capable of regular use by HGV traffic.	Where the road is Trunk or A-class, constructed to accommodate	Where roads have no adjacent settlements. Includes new strategic trunk

Receptor	Sensitivity			
	frequent use by HGVs. Includes roads with traffic control signals, waiting and loading restrictions, traffic calming measures	Includes roads where there is some traffic calming or traffic management measures	significant HGV composition. Includes roads with little or no traffic calming or traffic management measures	roads that would be little affected by additional traffic and suitable for ALLs and new strategic trunk road junctions capable of accommodating ALLs.
Users/ Residents of Locations	Where a location is a large rural settlement containing a high number of community and public services and facilities	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services	Where a location is a small rural settlement, few community or public facilities or services	Where a location includes individual dwellings or scattered settlements with no facilities

- 12.47 Where a road passes through a location, users are considered subject to the highest level of sensitivity defined by either the road or the location characteristics.

Magnitude

- 12.48 Magnitude of change has been assessed in accordance with the following rules which are outlined in the 2023 IEMA Guidelines, and are used to inform a screening exercise to determine which links within the study area are to be considered for detailed analysis in the assessment:
- Rule 1 – Include highway links where traffic flows will increase by more than 30 % (or where the number of heavy goods vehicles (HGVs) is predicted to increase by more than 30 %); and
 - Rule 2 – Include any other specifically sensitive areas where total traffic flows are predicted to increase by 10% or more.
- 12.49 Examples of sensitive areas are presented in the 2023 IEMA Guidelines as hospitals, churches, schools, historical buildings and tourist attractions etc. These locations are to be assessed in relation to “Rule 2”.
- 12.50 The 2023 IEMA Guidelines identify the key impacts that are most important when assessing the magnitude of traffic impacts from an individual development; the impacts and levels of magnitude are discussed below:
- Severance – the IEMA Guidance advises that, “The Department for Transport has historically set out a range of indicators for determining the significance of severance. Changes in traffic flow of 30 %, 60 % and 90 % are regarded as producing ‘slight’, ‘moderate’ and ‘substantial’ changes in severance respectively. Although these thresholds no longer appear in Department for Transport guidance, they have not been superseded by subsequent changes to guidance and are established

through planning case law. However, caution needs to be observed when applying these thresholds as very low baseline flows are unlikely to experience severance impacts even with high percentage changes in traffic." (Para 3.16). The Guidelines acknowledge that changes in traffic flows should be used cautiously, stating that "the assessment of severance should pay full regard to specific local conditions, e.g. sensitivity of adjacent land uses, prevalence of vulnerable people, whether or not crossing facilities are provided, traffic signal settings, etc." (Para 3.17).

- Driver delay – the IEMA Guidelines note that these delays are only likely to be "significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system" (Para 3.20).
- Pedestrian delay (incorporating delay to all non-motorised users) – the IEMA Guidance advises that "pedestrian delay and severance are closely related effects and can be grouped together. Changes in the volume, composition or speed of traffic may affect the ability of people to crossroads. In general, increases in traffic levels are likely to lead to greater increases in delay. Delays will also depend on the general level of pedestrian activity, visibility and general physical conditions of the development Site." (Para 3.24). Furthermore, the guidance advises that "...it is not considered wise to set down definitive thresholds. Instead it is recommended that the competent traffic and movement expert use their judgement to determine whether pedestrian delay constitutes a significant effect." (Para 3.26).
- Non-motorised user amenity - the IEMA Guidance advises that, "The 1993 Guidelines suggest that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or HGV component) is halved or doubled. Although these thresholds no longer appear in Department for Transport guidance, they have not been superseded by subsequent changes to guidance and are established through planning case law." (Para 3.30).
- Fear and intimidation – there are no commonly agreed thresholds for estimating levels of fear and intimidation, from known traffic and physical conditions. However, as the impact is considered to be sensitive to traffic flow, changes in traffic flow of 30 %, 60 % and 90 % are regarded as producing minor, moderate and substantial changes respectively in the guidelines. (Para 2.19). As such, this has been used to assess the potential impacts associated with construction activities around fear and intimidation on people in close proximity to the proposed development.
- Road safety – professional judgement would be used to assess the implications of local circumstances, or factors which may elevate or lessen risks of accidents. In line with the IEMA Guidance, those areas of collision clusters would be subject to detailed review.
- Road safety audits – It would be proposed to undertake any necessary Road Safety Audits (RSA) post consent and it is considered that this can be secured via a planning condition.
- Large loads – The movement of the AILs associated with the construction of the proposed development have been considered in full, within a separate route survey assessment (see **Technical Appendix 12.1: All Route Survey (EIA Volume 4)**), which identifies physical mitigation measures required to accommodate the predicted loads. Additional mitigation in terms of addressing potential impacts on sensitive receptors are included as standard within Mitigation During Construction sub-section.

- 12.51 While not specifically identified, as more vulnerable road users, cyclists and equestrian users are considered in similar terms to pedestrians.
- 12.52 It is not anticipated that any vehicle movements will be carrying hazardous loads (with the exception of small amounts of fuel for the construction plant and compound generators) to or from the Site during the construction phase.
- 12.53 Table 3.7 of LA104 Environmental Assessment Methodology of the Design Manual for Roads and Bridges (DMRB) sets out four levels against which the magnitude of these impacts should be assessed – major, moderate, minor and negligible. The impacts and levels of magnitude are discussed below in **Table 12.4**.

Table 12.4: Magnitude of Effect

Magnitude	Criteria
Major	These effects are considered to be material in the decision-making process.
Moderate	These effects may be important but are not likely to be material factors in decision making. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a receptor.
Minor	These effects may be raised as local factors. They are unlikely to be critical in the decision-making process but are important in improving the subsequent design of the project.
Negligible	No effects or those that are imperceptible.

Significance of Effects

- 12.54 The predicted significance of the effect was determined through a standard method of assessment based on professional judgement, considering both sensitivity and magnitude of change as detailed in **Table 12.5** below.

Table 12.5: Significance of Effects Matrix

Magnitude	Sensitivity			
	High	Medium	Low	Negligible
Major	Large	Large/Moderate	Moderate/Slight	Slight
Moderate	Large/Moderate	Moderate	Slight	Slight
Minor	Moderate/Slight	Slight	Slight	Slight/Neutral
Negligible	Slight	Slight/Neutral	Slight/Neutral	Neutral

- 12.55 In terms of the EIA Regulations, effects would be considered of significance where they are assessed to be large or moderate. Where an effect could be one of Large/Moderate or Moderate/Slight, professional judgement would be used to determine which option should be applicable.

Assumptions and Limitations

- 12.56 The assessment is based upon an assumed 18 month construction programme for the proposed development. Alterations in this programme, may increase or decrease traffic flows per month.
- 12.57 This assessment is based upon average traffic flows. There may be localised peaks with construction days where flows can be higher for a specific hour, such as a shift change on Site.
- 12.58 Assumptions on the origin points for materials have been made to provide a worst-case assessment scenario. Should these origin points change, the effects on surrounding areas may alter to those presented in the assessment.
- 12.59 It is considered that there is sufficient information to enable an informed decision to be taken in relation to the identification and assessment of likely significant environmental effects on Traffic and Transport.

Baseline Conditions

Pedestrian and Cycle Networks

- 12.60 There are limited pedestrian facilities in the immediate vicinity of the Site, reflecting its rural nature.
- 12.61 Further away from the proposed development Site in the wider study area, there are pedestrian facilities within the larger settlements, including Lairg, Ardgay and Bonar Bridge, where there are footways on one side or both sides of the carriageways. The level of pedestrian infrastructure is commensurate with the scale of the local settlements and their relative rural setting.
- 12.62 There are no Core Paths recorded by THC within the Site or near the proposed Site access junction. The closest Core Paths to the Site are located to the south in and around Lairg.
- 12.63 A review was undertaken of the Sustrans' National Cycle Network map which showed that the A836 (excluding the section between Lairg and Inveran) is listed as an "On-road route not on the National Cycle Network".

Road Links

- 12.64 Access to the Site would be taken directly from the A838 via an upgraded access junction which will facilitate all construction traffic, including AILs and operational traffic requirements. The indicative Site access layout is presented in **Technical Appendix 12.2**.
- 12.65 Within the study area, the A838 road is generally a narrow single track road with passing places. The A838 is maintained by THC and appears to have areas of deterioration based on available online imagery. Tirry bridge which is a three span simply supported concrete bridge is located along the A838, it is anticipated that improvements will be required to facilitate the delivery of AILs.

- 12.66 The A836 is a two-way single carriageway road which is a district distributor road that provides connections between Tain and Thurso by way of Lairg and Tongue. The road is generally of a good standard and typically varies between 6m and 7m in width, with a speed limit of 60 miles per hour (mph), with 30mph restrictions within settlements.
- 12.67 The A839 connects The Mound and A9 through to Lairg and beyond to Invercassley. The road is a two-way single carriageway road with a speed limit of 60mph, with 30mph restrictions within settlements and typically varies between 6m and 7m in width. Sections of the A839 appear to be in poor condition where deterioration of the road exists.
- 12.68 The A949 connects Clashmore to Lairg. The road is generally of a good standard however there are sections where there appears to be deterioration. The A949 a modern two-way single carriageway road with passing places and a speed limit of 60mph, with 30mph restrictions within settlements and typically varies between 6m and 7m in width.
- 12.69 The A836, A838, A839 and the A949 are all maintained and operated by THC.
- 12.70 The A9 is the main trunk road in the area and connects Polmont to Scrabster. The road is operated on behalf of Transport Scotland by BEAR Scotland. Within the study area, the road is subject to a 60mph speed limit in the main and is typically varies between 7m and 8m in width.
- 12.71 The A9 within the study area form part of the North Coast 500 (NC500) tourist route. This 830km (516 mile) route is now a popular tourist sightseeing route around the northwest Highlands and Sutherland and has been responsible for an increase in traffic visiting the study area.
- 12.72 A number of the roads within the Study area form part of the agreed route network used for the extraction of timber and are therefore, regularly used by HGV traffic, similar to the type used in the construction of the proposed development. The Agreed Timber Route Map has been developed by The Timber Transport Forum who are a partnership of the forestry and timber industries, local government, national government agencies, timber hauliers and road and freight associations. One of the key aims of the forum is to minimise the impact of timber transport on the public road network, on local communities and the environment, and a way of achieving this is to categorise the roads leading to forest areas in terms of their capacity to sustain the likely level of timber haulage vehicles i.e., HGVs. The routes are categorised into four groups, namely; 'Agreed Routes', 'Consultation Routes', 'Severely Restricted Routes' and 'Excluded Routes'.
- 12.73 'Agreed Routes' are categorised as routes used for timber haulage without restriction as regulated by the Road Traffic Act 1988. A-roads are classified as 'Agreed Routes' by default unless covered by one of the other road classifications. Those links classed as 'Consultation Routes' are categorised as a route which is key to timber extraction, but which are not up to 'Agreed Route' standard. Consultation with the local authority is required, and it may be necessary to agree limits of timing, allowable tonnage etc. before the route can be used. B-roads are classified as 'Consultation Routes' by default unless covered by one of the other classifications. 'Severely Restricted Routes' are not normally to be used for timber transport in their present condition. These routes are close to being Excluded Routes. Consultation with the local authority is required prior to use. Finally,

'Excluded Routes' should not be used for timber transport in their present condition. These routes are either formally restricted, or are close to being formally restricted, to protect the network from damaging loads.

- 12.74 Within the Study area, the A838 is listed as a Consultation Route, the A839 is a combination of an Agreed Route and Consultation Route, the A949 comprises an Agreed Route and the A836 mainly comprises an Agreed Route, with some short sections listed as a Consultation Route and the A9 is listed as an Agreed Route. These roads within the study are therefore regularly used by HGV traffic associated with the extraction of timber.

Existing Traffic Conditions

- 12.75 In order to assess the impact of development traffic on the study area existing traffic count data was obtained from the Transport Scotland (TS) and Department for Transport (DfT) databases.

- 12.76 The counts sites used were as follows:

- Count Site 1: A838 (DfT 40938);
- Count Site 2: A836, south of junction with A838 (DfT 10935);
- Count Site 3: A836, Achinduich (DfT 20934);
- Count Site 4: A836, north Bonar Bridge (DfT 50937);
- Count Site 5: A836, Ardgay (DfT 80005);
- Count Site 6: A839, north west of Pittentrail (DfT 20935);
- Count Site 7: A9(T), south west of Poles (TS ATC01023);
- Count Site 8: A9(T), south of Dornoch Bridge (TS ATC01020);
- Count Site 9: A9 (T), Morangie (TS ATC01021);
- Count Site 10: A9 (T), south west of Nigg Roundabout (TS ATC01333);
- Count Site 11: A9 (T), south west of Kildary (TS ATC01018);
- Count Site 12: A9 (T), Tomich (TS ATC01017);
- Count Site 13: A9 (T), south of Brora (TS ATC01025); and
- Count Site 14: A949, west of Whiteface (DfT 80006).

- 12.77 The traffic data allowed the traffic flows to be split into vehicle classes. The data was summarised into Cars/Lights and HGVs (all goods vehicles >3.5 tonnes gross maximum weight and buses). The locations of the traffic counters are shown in **Figure 12.2**.

- 12.78 The NRTF high and low growth factors from 2023 to 2024 are 1.012 and 1.005, respectively. These factors were applied to the 2023 traffic data obtained from the DfT and TS traffic statistics databases to estimate the 2024 Base traffic flows shown in **Table 12.6**.

Table 12.6: Average Daily Traffic Flows (2024)

Ref No.	Survey Location	Source	Cars / Lights	HGV	Total	% HGV
1	A838, near Site Access	DfT	62	15	77	19.74%

Ref No.	Survey Location	Source	Cars / Lights	HGV	Total	% HGV
2	A836, south of junction with A838	DfT	763	70	833	8.38%
3	A836, Achinduich	DfT	944	81	1,025	7.90%
4	A836, north Bonar Bridge	DfT	1,602	111	1,713	6.50%
5	A836, Ardgay	DfT	1,648	136	1,783	7.60%
6	A839, north west of Pittentrail	DfT	797	36	834	4.37%
7	A9(T), south west of Poles	TS	3,319	856	4,175	20.51%
8	A9(T), south of Dornoch Bridge	TS	6,113	801	6,914	11.58%
9	A9 (T), Morangie	TS	6,807	1,333	8,139	16.37%
10	A9 (T), south west of Nigg Roundabout	TS	7,388	1,877	9,265	20.26%
11	A9 (T), south west of Kildary*	TS	7,242	1,756	8,998	19.52%
12	A9 (T), Tomich	TS	8,324	1,810	10,134	17.86%
13	A9 (T), south of Brora	TS	3,593	866	4,459	19.43%
14	A949, west of Whiteface	DfT	921	52	973	5.31%

Variances may occur due to rounding

* The most up to date 2024 traffic information was retrieved as the TS website showed that more information was available for 2024 than for 2023. No growth factor was applied.

Accident Data

- 12.79 Road traffic accident data for the three-year period commencing 1st of January 2020 through to the 31st of December 2022 was obtained from the online resource crashmap.co.uk which uses data collected by the police about road traffic crashes occurring on British roads where someone is injured.
- 12.80 The statistics are categorised into three categories, namely “Slight” for damage only incidents, “Serious” for injury accidents and “Fatal” for accidents that result in a death. A summary of the incidents is presented in **Table 12.7** and the locations of the accidents are presented in **Figure 12.3**.

Table 12.7 Personal Injury Accident Summary

Road Link	Slight	Serious	Fatal	HGV
A838	0	0	0	0
A9	16	8	1	6
A839	0	3	0	0
A836	3	1	1	1
A949	0	0	0	0
Total	19	12	2	7

Road Link	Slight	Serious	Fatal	HGV
Percentage	58%	36%	6%	21%

12.81 A summary analysis of the incidents along the study area indicates that:

Road Link: the A838

- There were no accidents recorded on the A838 in the study area within the most recent three-year period recorded.

Road Link: the A9

- A total of 25 incidents were recorded over the three-year period along the A9 within the study area. Of those, 16 were classified as "Slight" (64%), eight were "Serious" (32%), and one fatality was recorded;
- The fatal incident occurred south west of Obsdale Road junction and involved a car and an HGV;
- There was one accident involving a pedestrian and an HGV on the Main Street in Golspie. This incident was recorded as being "Slight";
- A total of six incidents involved an HGV (24%), four of which were "Slight", one "Serious", and one fatality;
- Two separate accidents involved collisions between a motorcycle and HGV, of which one was classified as "Slight" and one as "Serious";
- Six incidents occurred at the A9 priority junction with the B9174 at Knockbreck. Within this cluster, three incidents were "Slight" and three "Serious". Another accident was recorded to the south of the junction and was recorded as "Slight" and involved three cars;
- Two separate accidents were recorded to the west of the A9 junction with Academy Road, Tomich, both of which were classified as "Slight". One of the accidents involved a collision between four cars and another involved a collision between a car and HGV;
- Four of the incidents on the A9 involved a young driver (16%), three of which were "Slight" and one "Serious"; and
- One incident on the A9 involved a child casualty which was categorised as "Slight".

Road Link: the A839

- There were a total of three incidents on the A839 within the most recent three-year period recorded in the study area. All three of these incidents were categorised as being "Serious";
- All incidents on the A839 involved a car, with one incident also involving a motorcycle; and
- The incident involving a motorcycle occurred on a bend to the east of Ardachu.

Road Link: the A836

- A total of five incidents occurred on the A836 within the most recent three-year period recorded in the study area. Of these, three were recorded as being "Slight" (60%), one was "Serious" (20%), and one "Fatal" (20%);
- One of the incidents involved an HGV. This incident occurred west of Ardvannie and was recorded as being "Slight";
- Two of the incidents recorded on the A836 involved a young driver, one of which was categorised as being "Serious" and one "Slight";
- Two of the incidents on the A836 occurred at the same junction with the A837, one of which was "Slight" and one "Serious"; and
- None of the incidents which occurred on the A836 involved a pedestrian or a child casualty.

Road Link: the A949

- There were no accidents recorded on the A949 in the study area within the most recent three-year period recorded.

PIA Summary

- 12.82 There were a total of 33 incidents recorded within the study area in the most recent three-year period recorded. Of these, 19 were categorised as being "Slight" (58%), 12 were categorised as "Serious" (36%), and two were "Fatal" (6%).
- 12.83 There is one cluster of six incidents which occurred at the T-junction with the A9 and the B9174. This was not in close proximity with the Site access.
- 12.84 There are no incidents recorded within the vicinity of the Site access.
- 12.85 Based on the information available, it has been established that there are no specific road safety issues within the immediate vicinity of the proposed development or within the study area that currently require to be addressed or would be exacerbated by the construction of the proposed development.

Future Baseline Flows

- 12.86 Construction of the project is anticipated to commence during 2029, if consent is granted.
- 12.87 To assess the likely effects during the construction phase, base year traffic flows were determined by applying a NRTF low and high growth factors to the traffic flows.
- 12.88 The NRTF low and high growth factors for 2024 to 2029 are 1.026 and 1.061, respectively. These factors were applied to the 2024 traffic data shown in **Table 12.6** to estimate the 2029 Base traffic flows shown in **Table 12.8**.

Table 12.8: Average Daily Traffic Flows (2029)

Ref No.	Survey Location	Cars / Lights	HGV	Total
1	A838, near Site Access	65	16	82
2	A836, south of junction with A838	810	74	884
3	A836, Achinduich	1,002	86	1,088
4	A836, north Bonar Bridge	1,700	118	1,818
5	A836, Ardgay	1,748	144	1,892
6	A839, north west of Pittentrail	846	39	885
7	A9(T), south west of Poles	3,405	879	4,283
8	A9(T), south of Dornoch Bridge	6,272	822	7,094
9	A9 (T), Morangie	6,984	1,367	8,351
10	A9 (T), south west of Nigg Roundabout	7,580	1,926	9,506
11	A9 (T), south west of Kildary	7,430	1,802	9,232
12	A9 (T), Tomich	8,541	1,857	10,398
13	A9 (T), south of Brora	3,686	889	4,575
14	A949, west of Whiteface	977	55	1,032

Variances may occur due to rounding

Receptor Sensitivity

- 12.89 A review of sensitive receptors has been undertaken within the study area. **Table 12.9** details the receptors and their sensitivities for use within the following assessment. A justification for the sensitivity has been provided, based upon the details contained in **Table 12.3**.

Table 12.9: Receptor Sensitivity Summary

Receptor	Sensitivity	Justification
Users of A838	High	Where the road is a minor rural road, not constructed to accommodate frequent use by HGVs.
Users of A836	Low	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition. Includes roads with little or no traffic calming or traffic management measures.
Residents of A836 (outwith towns / villages)	Negligible	Where a location includes individual dwellings or scattered settlements with no facilities
Users of A949	Medium	Where the road is a local A or B class road, capable of regular use by HGV traffic.

Receptor	Sensitivity	Justification
Residents of A949 (outwith towns / villages)	Negligible	Where a location includes individual dwellings or scattered settlements with no facilities
Users of A839	Medium	Where the road is a local A or B class road, capable of regular use by HGV traffic.
Residents of A839 (outwith towns / villages)	Negligible	Where a location includes individual dwellings or scattered settlements with no facilities
Users of A9	Low	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition. Includes roads with little or no traffic calming or traffic management measures.
Residents of A9 (outwith towns / villages)	Negligible	Where a location includes individual dwellings or scattered settlements with no facilities
Residents in Rogart	Low	Where a location is a small rural settlement, few community or public facilities or services.
Residents in Lairg	Low	Where a location is a small rural settlement, few community or public facilities or services.
Residents in Bonar Bridge	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Residents in Ardgay	Low	Where a location is a small rural settlement, few community or public facilities or services.
Residents in Tain	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Residents in Golspie	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Residents in Brora	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.

12.90 As previously noted in the 'Criteria for Assessing Magnitude of Change' section, examples of sensitive areas are presented in the IEMA Guidelines as locations which include hospitals, churches, schools, historical buildings tourist attractions for example. Based on these indicators which are stated within the IEMA Guidelines, the following locations within the study area have been identified as sensitive areas in this assessment

- Rogart;
- Lairg;
- Bonar Bridge;
- Ardgay;
- Tain;

- Golspie; and
- Brora.

- 12.91 These locations are therefore subject to 'Rule 2' of the IEMA Guidelines which requires a full assessment of effects if the locations are subject to a total traffic increase of 10% or more.
- 12.92 As requested by THC (and outlined in **Table 12.1**), the A838 is also assessed subject to 'Rule 2'.
- 12.93 All other receptors within the study area are subject to 'Rule 1' and are assessed if total traffic flows (or HGV flows) on highway links increase by more than 30%.

Identification and Evaluation of Key Effects

Construction Effects

- 12.94 The assessment is based upon the construction effects that may occur within the study area. In order to assess the effects, it is necessary to determine the likely traffic generation associated with the proposed development.
- 12.95 During the assumed 18 month construction period, the following traffic would require access to the Site:
- Staff transport, either cars or staff minibuses;
 - Construction equipment and materials, deliveries of machinery and supplies such as concrete raw materials;
 - AILs consisting of the wind turbine components and heavy lift crane(s); and
 - Escort vehicles for AIL deliveries.
- 12.96 It should be noted that there may be variances in the following calculations due to rounding errors. These are not considered significant.

Construction Staff

- 12.97 Staff would arrive in non-HGV vehicles and where possible will be encouraged to car share. The workforce onsite will depend on the activities undertaken; however, it is assumed that a maximum workforce of up to 45 staff per day is to be expected.
- 12.98 For the purposes of estimating traffic movements, it was assumed that 40% of staff would be transported by minibus and 60% would arrive by car (single car occupancy was assumed as the worst case at this stage with potentially fewer movements through car sharing).
- 12.99 Based on these assumptions, staff transport cars and light vehicles would account for a maximum of approximately 60 vehicle trips (30 inbound and 30 outbound) per day during the peak period of construction.

Abnormal Indivisible Load Deliveries

- 12.100 The turbines are broken down into components for transport to the Site. The nacelle, blade and tower sections are classified as AILs due to their weight, length, width and height when loaded. For the purposes of the report, the 'worst case' numbers of components requiring transport are illustrated in **Table 12.10**.

Table 12.10: Turbine Components

Component	Number of Components per Turbine
Rotor Blades	3
Tower Sections	6
Nacelle	1
Hub	1
Drive Train	1
Nose Cone	1
Transformer	1
Ancillary	1
Site Parts	0.2

- 12.101 In addition to the turbine deliveries, two high-capacity erection cranes would be needed to offload a number of components and erect the turbines. The cranes are likely to be mobile cranes with a capacity up to 1,000 tonnes that are escorted by boom and ballast trucks to allow full mobilisation onsite. Smaller erector cranes would also be present to allow the assembly of the main cranes and to ease the overall erection of the turbines.
- 12.102 Escort vehicles would accompany the AIL convoys to support the traffic management measures. Up to three vehicles would be deployed and it is assumed that three turbine components would be delivered per convoy.
- 12.103 Based on the above, a total of 428 AIL two-way movements are predicted and it is expected that up to three AIL turbine components would be delivered per convoy. Turbine components that do not classify as AILs, would be delivered in addition to these, resulting in a further 334 journeys (167 inbound trips and 167 outbound trips). All of these deliveries are expected to occur over a period of approximately four months.
- 12.104 The escort vehicles have been assumed to be police cars and light goods vehicles. Motorcycles may be deployed, depending upon Police resources.

General Deliveries

- 12.105 Throughout the construction phase, general deliveries will be made to the Site by means of HGV. These would include fuel, Site office and staff welfare. At the height of construction, it is assumed that up to 40 journeys to Site are made (20 inbound and 20 outbound) per month.

Material Deliveries

- 12.106 Various materials will need to be delivered to Site to form the site-based infrastructure. At the outset, HGV deliveries will deliver plant and initial material deliveries to the Site to enable the formation of the Site compound and to deliver construction machinery.
- 12.107 For the purpose of this assessment, it is assumed that all concrete material deliveries will arrive to the Site from local quarries to the south. Onsite batching will occur as the physical size of the compound can accommodate this. Deliveries associated with the concrete deliveries are expected to generate a total of 1,548 journeys (774 inbound and 774 outbound).
- 12.108 Reinforcement required in the foundations across the Site are detailed in **Table 12.11** below.

Table 12.11: Steel Reinforcement Deliveries

Element	Weight / Installation (t)	Total Weight (t)	Lorry Capacity (t)	Inbound Trips	Total Journeys
Turbine Foundation	140	2,100	30	70	140
Substation Foundation	20	20	30	1	2

- 12.109 It is anticipated that the onsite access tracks will be constructed from crushed rock and material won from the Site via the three onsite borrow pits.
- 12.110 The access tracks would generally be 6m in width and would be designed to accommodate 13 tonne axle loads. In addition to the roads, crane pads will be constructed to enable the turbine erection process. The tracks, crane pads and compounds will require geotextile in the foundations.
- 12.111 To provide a robust assessment of potential impact, it has been assumed that 50% of the material for tracks, hardstanding's and compound areas will be imported from the Site. This represents an overestimate, with the expectation that the borrow pits will be a more than adequate source for material. The assessment is therefore an over-estimate and is considered robust.
- 12.112 The estimate of the imported material is shown in **Table 12.12**.

Table 12.12: Track Material Deliveries

Element	Volume / Installation (m³)	Total Weight (t)	Lorry Capacity (t)	Inbound Trips	Total Journeys
Assumed 50% of required stone	58,702	129,144	20	6,458	12,916

- 12.113 Geotextile will be delivered to Site in rolls. A total of 180 large rolls may be required at Site and would be delivered by HGV which would result in a total of 20 journeys (10 inbound and 10 outbound).
- 12.114 Cables will connect each turbine to the internal substation and control building. Trip estimates for the cable materials are provided below in **Tables 12.13** and **12.14**.
- 12.115 Three cables are to be provided within each cable trench and would be backfilled with cable sand. The cable materials would be likely sourced from the south of the Site via the A9.

Table 12.13: Cable Trip Estimate

Element	Total Cable Length (m)	Length per Drum (m)	Number of Drums	Inbound Trips	Total Journeys
Cables	22,500	500	45	5	10

Table 12.14: Cable Sand Trip Estimate

Element	Total Volume (m3)	Total Weight (t)	Lorry Capacity (t)	Inbound Trips	Total Journeys
Cable Sand	7,500	4,050	20	203	406

- 12.116 A substation will be constructed on the Site. This will require deliveries of building materials and structural elements and would result in approximately 132 journeys.
- 12.117 Timber felling to allow construction works will also be required. The forestry review of the Site indicates that during construction it is expected that 7,668 journeys (3,834 inbound and 3,834 outbound) will be undertaken.
- 12.118 The resulting traffic generation estimates have been plotted onto the indicative construction programme to illustrate the peak journeys on the network.
- 12.119 **Table 12.15** illustrates the trip generation throughout the construction programme for each month, showing two-way construction vehicle movements, i.e. an inbound and outbound trip.

Table 12.15: Construction Traffic Profile (two-way trips)

Activity	Class	Month																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Site Establishment	HGV	50	50															50	50
General Site Deliveries	HGV	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Imported Stone	HGV					2,153	2,153	2,153	2,153	2,153	2,153								
Reinforcement	HGV					47		47		47									
Concrete Deliveries	HGV					258	258	258	258	258	258								
Cable and Ducting Deliveries	HGV									7		7		7					
Cabling Sand	HGV									68	68	68	68	68	68				
Geotextile Deliveries	HGV					10		10											
Substation Building	HGV								33	33	33	33							
Cranes	HGV												15			15			
Energy Storage	HGV														2				
Forestry Extraction	HGV	1,917	1,917	1,917	1,917														
Turbine Component Deliveries	HGV												107	107	107	107			
All Escorts	Car & LGV												84	84	84	84			
Commissioning	Car & LGV															22	22	22	22
Staff	Car & LGV	660	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,012	660
Total HGV		2,007	2,007	1,957	1,957	2,508	2,451	2,508	2,484	2,605	2,551	147	229	221	216	55	40	90	90
Total Cars / LGV		660	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,404	1,404	1,404	1,342	1,342	1,034	682
Total Movements		2,667	3,327	3,277	3,277	3,828	3,771	3,828	3,804	3,925	3,871	1,467	1,633	1,624	1,620	1,587	1,382	1,124	772
Total HGV per Day		91	91	89	89	114	111	114	113	118	116	7	10	10	10	3	2	4	4
Total Cars / LGV per Day		30	60	60	60	60	60	60	60	60	60	60	64	64	64	61	61	47	31
Total per Day		121	151	149	149	174	171	174	173	178	176	67	74	74	74	72	63	51	35

Variances may occur due to rounding. Assumes 22 working days in a month.

12.120 The peak of construction occurs in Month 9 with 178 journeys (60 Car / Lights and 118 HGV journeys).

Distribution of Construction Trips

12.121 The distribution of development traffic on the network would vary depending on the types of loads being transported. The assumptions for the distribution of construction traffic during the peak months would be as follows:

- Deliveries associated with the delivery of aggregate material for tracks, crane pads and compounds would be from the south via the A836 from Ardgay, Bonar Bridge and Lairg. For the purposes of the assessment, it is assumed that all material will be taken from local quarries to the south.
- For the purpose of this assessment, it is assumed that deliveries associated with onsite concrete batching including cement, water, sand and aggregates would be delivered from suppliers located off the A9 to the south, and via A836. The BoP contractor will confirm final quarry and material sourcing with THC in the CTMP.
- HGV deliveries associated with the HV electrical installation, BESS, etc. will arrive via the A9 and A836, passing through Lairg.
- Staff working at the Site are likely to be based locally. It is assumed that 40 % will come from Bonar Bridge, 40 % from Lairg and 20 % from Alness.
- General site deliveries will be via the A9, A839, A836 and A838 to Site.
- Timber will be taken from the site and is expected to be exported to locations south of Alness via the A838, A836, A839 and the A9.

12.122 For the purposes of this assessment, it has been assumed that all AIL traffic will access the proposed development Site from the Port of Nigg or Port of Invergordon via the following route from the A9:

- loads will continue north along the A9;
- at The Mound, loads will turn left onto the A839 and will proceed westbound to Lairg;
- in Lairg, loads will turn right and will continue northbound on the A836; and
- loads will turn left onto the A838 and will then proceed northbound along the shore of Loch Shin to the proposed site entrance.

12.123 The peak traffic flows have been developed and are shown in **Table 12.16**.

Table 12.16: Peak Construction Traffic (Month 9)

Survey Location	Cars & Lights	HGVs	Total
A838, near Site Access	60	118	178
A836, south of junction with A838	60	118	178
A836, Achinduich	24	98	122
A836, north Bonar Bridge	24	98	122
A836, Ardgay	0	98	98
A839, north west of Pittentrail	12	107	119

Survey Location	Cars & Lights	HGVs	Total
A9(T), south west of Poles	12	21	33
A9(T), south of Dornoch Bridge	12	21	33
A9 (T), Morangie	12	21	33
A9 (T), south west of Nigg Roundabout	12	21	33
A9 (T), south west of Kildary	12	21	33
A9 (T), Tomich	12	21	33
A9 (T), south of Brora	0	0	0
A949, west of Whiteface	0	0	0

Please note minor variances due to rounding may occur.

Predicted Construction Effects

- 12.124 To estimate the total trips through the study area during the peak of the construction phase, traffic was distributed through the network and combined with the 2029 Baseline traffic data. The resulting figures were compared with the weekday 2029 Baseline traffic to provide a percentage change in movements.

Table 12.17: Traffic Impact Summary

Survey Location	Cars & Lights	HGVs	Total	Cars & Lights % Increase	HGVs % Increase	Total Traffic % Increase
A838, near Site Access	125	135	260	92%	735%	219%
A836, south of junction with A838	870	193	1,062	7%	160%	20%
A836, Achinduich	1,026	184	1,210	2%	114%	11%
A836, north Bonar Bridge	1,724	216	1,940	1%	83%	7%
A836, Ardgay	1,748	242	1,990	0%	68%	5%
A839, north west of Pittentrail	858	145	1,003	1%	276%	13%
A9(T), south west of Poles	3,417	899	4,316	0%	2%	1%
A9(T), south of Dornoch Bridge	6,284	842	7,127	0%	3%	0%
A9 (T), Morangie	6,996	1,388	8,384	0%	2%	0%
A9 (T), south west of Nigg Roundabout	7,592	1,947	9,539	0%	1%	0%
A9 (T), south west of Kildary	7,442	1,822	9,265	0%	1%	0%
A9 (T), Tomich	8,553	1,878	10,430	0%	1%	0%
A9 (T), south of Brora	3,686	889	4,575	0%	0%	0%

Survey Location	Cars & Lights	HGVs	Total	Cars & Lights % Increase	HGVs % Increase	Total Traffic % Increase
A949, west of Whiteface	977	55	1,032	0%	0%	0%

Please note minor variances due to rounding may occur.

12.125 With reference to the IEMA Guidelines, total traffic movements are not predicted to increase by more than 30% on the study network, with the exception of the A838, near the Site Access.

12.126 The table shows that total traffic movements will increase by approximately 219% on the A838, near the Site Access. Whilst this increase could be considered high, it is generally caused by relatively low traffic flows on the road at this location which will see an increase of 178 daily traffic movements. This represents approximately 15 movements per hour on the A838 during construction activities (on a typical weekday (Mon-Fri 08:00-19:00 and Sat 08:00-13:00)), which is not considered significant in terms of overall traffic flows.

12.127 **Table 12.17** shows that HGV traffic movements will increase by over 30% at the following locations:

- the A838, near the Site Access (735% increase);
- the A836, south of junction with A838 (160% increase);
- the A836, Achinduich (114% increase);
- the A836, north Bonar Bridge (83% increase);
- the A836, Ardgay (68% increase); and
- the A839, north of Pittentrail (276% increase).

12.128 While the increase in flows at these locations are statistically significant, it is generally caused by relatively low total flows along the road links which will see less than ten additional journeys every hour which is not considered significant in terms of overall traffic flows.

12.129 A review of existing theoretical road capacity has been undertaken using The NESAs Manual, formerly part of the Design Manual for Roads and Bridges, Volume 15, Part 5. The theoretical road capacity has been estimated for each of the road links for a 12-hour period that makes up the study area. The results are summarised in **Table 12.18**.

Table 12.18: 2029 Daily Traffic (12hr) Capacity Review Summary

Survey Location	2029 Baseline Flow	2029 Base + Development	Theoretical Road Capacity (12hr)	Spare Road Capacity %
A838, near Site Access	82	260	3,360	92%
A836, south of junction with A838	884	1,062	19,200	94%
A836, Achinduich	1,088	1,210	21,600	94%

Survey Location	2029 Baseline Flow	2029 Base + Development	Theoretical Road Capacity (12hr)	Spare Road Capacity %
A836, north Bonar Bridge	1,818	1,940	21,600	91%
A836, Ardgay	1,892	1,990	19,200	90%
A839, north west of Pittentrail	885	1,003	21,600	95%
A9(T), south west of Poles	4,283	4,316	28,800	85%
A9(T), south of Dornoch Bridge	7,094	7,127	28,800	75%
A9 (T), Morangie	8,351	8,384	28,800	71%
A9 (T), south west of Nigg Roundabout	9,506	9,539	28,800	67%
A9 (T), south west of Kildary	9,232	9,265	28,800	68%
A9 (T), Tomich	10,398	10,430	28,800	64%
A9 (T), south of Brora	4,575	4,575	28,800	84%
A949, west of Whiteface	1,032	1,032	28,800	96%

Please note minor variances due to rounding may occur.

- 12.130 The results indicate there are no road capacity issues with the addition of construction traffic associated with the proposed development and ample spare capacity exists within the trunk and local road network to accommodate construction phase traffic.
- 12.131 In accordance with the IEMA Guidelines Rules 1 and 2, detailed assessment is required on the following identified sensitive receptors included in **Table 12.9** or the specifically sensitive locations highlighted in **Section 12.90**.
- A838 Users / Residents (High Sensitivity);
 - A836 Users (including cyclists on cycle route) / Residents (Low Sensitivity);
 - A839 Users / Residents (Medium Sensitivity);
 - Lairg Residents (Low Sensitivity); and
 - Rogart Residents (Low Sensitivity).
- 12.132 For the purposes of undertaking the assessment, where both the users of a road and residents in the vicinity of the road require to be assessed, these have been done together to avoid repetition.
- 12.133 The significance of the potential effects on the above receptors has been determined using the rules and thresholds previously outlined in the Assessment of Significance section. **Table 12.19** summarises the significance on the receptors for the construction phase.

Table 12.19: Overall Construction Phase Effects Assessment

Receptors	Severance	Driver Delay	Pedestrian Delay	Non-motorised User Amenity	Fear & Intimidation	Road Safety	Large Loads
A838 Users / Residents	Large	Large / Moderate	Moderate / Slight	Moderate / Slight	Large	Moderate / Slight	Large
A836 Users (including cyclists on cycle route) / Residents	Slight	Slight	Slight	Slight	Slight	Slight	Moderate / Slight
A839 Users / Residents	Slight	Slight	Slight	Slight	Slight	Slight	Moderate / Slight
Lairg Residents	Slight	Slight	Slight	Slight	Slight	Slight	Moderate / Slight
Rogart Residents	Slight	Slight	Slight	Slight	Slight	Slight	Moderate / Slight

- 12.134 The assessment of significance suggests that A838 Users / Residents are considered likely to experience overall **significant** effects in accordance with the EIA Regulations, prior to the application of mitigation measures.
- 12.135 The construction effects on the A836 Users / Residents, A839 Users / Residents, Lairg Residents and Rogart Residents are considered mainly Slight and **not significant**.
- 12.136 It should be noted that the impacts relate solely to the peak of construction activities and that the construction period is short lived (18 months) and the effects transitory in nature. Whilst it is acknowledged that other months within the construction programme may cause significant effects, these would be less than those assessed and for which mitigation measures have been proposed.

Operational Effects

- 12.137 It is predicted that during the operational phase of the wind farm there would be up to two vehicle movements per week for maintenance purposes associated with the proposed development. Also, there may be occasional AIL movements to deliver replacement components to the wind farm site in the unlikely event of a major failure.

Decommissioning Effects

- 12.138 The decommissioning phase would result in fewer trips on the road network than the construction phase as it is considered likely that the majority of the proposed access track would be left in place for wider estate access.
- 12.139 Prior to decommissioning of the site, a traffic assessment would be undertaken, and appropriate traffic management procedures followed.

Mitigation Measures and Monitoring

Construction Traffic Management Plan

- 12.140 During the construction period, a project website, blog or Social Media feed would be regularly updated to provide the latest information relating to traffic movements associated with vehicles accessing the Site. This would be agreed with THC.
- 12.141 The following measures would be implemented during the construction phase through the CTMP:
- Agree ALL route modifications and improvements with THC, TS and other relevant stakeholders. Works which will be required to facilitate turbine deliveries are outlined in the RSR, which is presented in **Technical Appendix 12.1**;
 - Where possible, the detailed design process will minimise the volume of material to be imported to site to help reduce HGV numbers;
 - A Staff Travel Plan, including transport modes to and from the worksite (including pick up and drop off times);
 - A Transport Management Plan for ALL deliveries;
 - All materials delivery lorries (dry materials) should be sheeted to reduce dust and stop spillage on public roads;
 - Specific training and disciplinary measures should be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
 - Wheel cleaning facilities may be established at the site entrance, depending on the views of THC;
 - Normal site working hours will be limited to between 0700 and 1900 Monday to Friday and 0700 and 1300 on Saturdays though component delivery and turbine erection may take place outside these hours i.e. depending on when police escort is available;
 - Appropriate traffic management measures will be put in place on the A838 leading through to the Site, to avoid conflict with general traffic, subject to the agreement of THC. Typical measures will include HGV turning and crossing signs and / or banksmen at the site access and warning signs;
 - Provide construction updates on the project website, social media feeds and a newsletter to be distributed to residents within an agreed distance of the site;
 - Adoption of voluntary reduced speed limits, for example on the A838 in the vicinity of the site access junction and at other locations to be agreed with THC;
 - All drivers will be required to attend an induction to include:
 - A toolbox talk safety briefing;
 - The need for appropriate care and speed control;
 - Highlighting the presence of pedestrian and cyclists on the Study Area, in particular on the A836;
 - A briefing on driver speed reduction agreements (to slow site traffic at sensitive locations through the villages); and

- Identification of the required access routes and the controls to ensure no departure.

Wear & Tear Agreement

- 12.142 It is anticipated that THC will require an agreement to cover the cost of abnormal wear and tear on the A838.
- 12.143 Video footage of the pre-construction phase condition of the abnormal loads access route and the construction vehicles route would be recorded to provide a baseline of the state of the road prior to any construction work commencing. This baseline would inform any change in the road condition during the construction stage of the proposed development. Any necessary repairs would be coordinated with THC. Any damage caused by traffic associated with the proposed development, during the construction period that would be hazardous to public traffic, would be repaired immediately.
- 12.144 Any damage to road infrastructure caused directly by construction traffic would be made good, and street furniture that is removed on a temporary basis would be fully reinstated.
- 12.145 There would be a regular road edge review and any debris and mud would be removed from the public carriageway to keep the road clean and safe during the initial months of construction activity, until the construction junction and immediate access track works are complete.

Site Access Traffic Management Plan

- 12.146 A review of A838 passing places would be undertaken post consent with THC transport officers to agree a list of strategic passing place enhancements, if deemed necessary.
- 12.147 The review will consider passing places that would be extended and widened (within the limits of the adopted road boundary). This review will help improve journey times on the A838 in the single carriageway section and reduce potential conflicts with other road users.
- 12.148 Upon agreement of the passing place improvements, the passing places would be upgraded prior to the start of bulk deliveries being made to site.

Abnormal Indivisible Loads

- 12.149 Before the AILs traverse the routes from the PoE, the following tasks would be undertaken to ensure load and road user safety:
- ensure any vegetation which may foul the loads is trimmed back to allow passage;
 - confirm there are no roadworks or closures that could affect the passage of the loads;
 - check no new or diverted underground services on the proposed route are at risk from the abnormal loads; and
 - confirm the police are satisfied with the proposed movement strategy.

AIL Route Survey Report

- 12.150 The AIL Route Survey Report / Abnormal Load Assessments highlight a number of constraint points which have been assessed within the report using swept path assessment software for both an 81.5m blade and the most onerous tower sections. The locations of the constraint points and the swept path drawings are included in the AIL RSRs provided in **Technical Appendix 12.1**.
- 12.151 The RSR provided in **Technical Appendix 12.1** identify key points and issues associated with the route that require street furniture removal and temporary paving to accommodate the predicted loads.
- 12.152 AIL mitigation works will be designed to be temporary in nature to enable restoration to their original condition (if required by THC).

AIL Transport Management Plan

- 12.153 An AIL Transport Management Plan will be developed. All AIL deliveries would be undertaken at appropriate times (to be discussed and agreed with the relevant roads authorities and police) with the aim of minimising the effects on the local road network. It is likely that the abnormal load convoys would travel in mid-morning to avoid school drop off and pick up times.
- 12.154 The majority of potential conflicts between construction traffic and other road users will occur with abnormal load traffic. General construction traffic is not likely to come into conflict with other road users as the vehicles are smaller and road users are generally more accustomed to them.
- 12.155 Advance warning signs would be installed on the approaches to the affected road network. This signage will assist in helping improve driver information and allow other road users to consider alternative routes or times for their journey (where such options exist).
- 12.156 The location and numbers of signs would be agreed post consent and would form part of the wider Traffic Management Proposal for the project.
- 12.157 The Abnormal Load Transport Management Plan would also include:
- Procedures for liaising with the emergency services to ensure that police, fire and ambulance vehicles are not impeded by the loads. This is normally undertaken by informing the emergency services of delivery times and dates and agreeing communication protocols and lay over areas to allow overtaking;
 - A diary of proposed delivery movements to liaise with the communities to avoid key dates;
 - A protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic; and
 - Proposals to establish a construction liaison committee to ensure the smooth management of the project / public interface with the applicant, the construction contractors, the local community, and if appropriate, the police forming the

committee. This committee would form a means of communicating and updating on forthcoming activities and dealing with any potential issues arising.

Outdoor Access Management Plan

- 12.158 Consideration has been given to pedestrians, cyclists and equestrians alike due to potential interactions between construction traffic and users of forest tracks and public roads. If required, a Path Planning Study will be conducted post consent and will be secured through a planning condition. Findings from the study will be used to formulate a set of measures into an Outdoor Access Management Plan (OAMP).
- 12.159 Signage will be installed on the site exits that makes drivers aware of local speed limits and reminding drivers of the potential presence of pedestrians, cyclists and equestrians in the area. This will also be emphasised in the weekly toolbox talks.
- 12.160 The main factors causing fear in horses in this situation are:
- something approaching them, which is unfamiliar and intimidating;
 - a large moving object, especially if it is noisy;
 - lack of space between the horse and the vehicle;
 - the sound of air brakes; and
 - anxiety on the part of the rider.
- 12.161 The British Horse Society has previously recommended the following actions that will be included in the site training for all HGV staff:
- on seeing riders approaching, drivers must slow down and stop, minimising the sound of air brakes, if possible;
 - if the horse still shows signs of nervousness while approaching the vehicle, the engine should be shut down (if it is safe to do so);
 - the vehicle should not move off until the riders are well clear of the back of the HGV;
 - if drivers are wishing to overtake riders, please approach slowly or even stop in order to give riders time to find a gateway or lay by where they can take refuge and create sufficient space between the horse and the vehicle. Because of the position of their eyes, horses are very aware of things coming up behind them; and
 - all drivers delivering to the site must be patient. Riders will be doing their best to reassure their horses while often feeling a high degree of anxiety themselves.

Staff Travel Plan

- 12.162 A Staff Travel Plan will be deployed where necessary, to manage the arrival and departure profile of staff and to encourage sustainable modes of transport, especially car-sharing. A package of measures could include:
- appointment of a Travel Plan Coordinator (TPC);
 - provision of public transport information;
 - mini-bus service for transport of site staff;

- promotion of a car sharing scheme; and
- car parking management.

Operational Phase Mitigation

- 12.163 The Site entrance will be gated, well maintained and monitored during the operational life of the proposed development. Regular maintenance will be undertaken to keep the site access track drainage systems fully operational and the road surface in good condition and to ensure there are no adverse issues affecting the public road network.

Cumulative Effects

- 12.164 As detailed earlier, there are three consented onshore wind farms which could potentially impact the roads within the study area, namely Achany Wind Farm Extension, Creag Riabhach Wind Farm Extension and Strathrory Wind Farm Re-Design.
- 12.165 A combined sensitivity review has been undertaken to inform the planning authorities of possible increases in traffic flows if the proposed development and aforementioned wind farms were to be constructed concurrently.
- 12.166 The peak flows for the three schemes were obtained from their respective planning application documents (see **Table 12.20**) and then compared to the future baseline (2029) on **Table 12.21**.

Table 12.20: Combined Scheme Sensitivity Review Peak Traffic Summary

Survey Location	Proposed Development		Achany WF Ext		Creag Riabhach WF Ext		Strathrory WF Re-Design	
	Cars & Lights	HGV	Cars & Lights	HGV	Cars & Lights	HGV	Cars & Lights	HGV
A838, near Site Access	60	118	0	0	0	0	0	0
A836, south of junction with A838	60	118	0	0	16	6	0	0
A836, Achinduich	24	98	0	0	10	6	0	0
A836, north Bonar Bridge	24	98	45	93	10	6	0	0
A836, Ardgay	0	98	45	93	0	6	0	0
A839, north west of Pittentrail	12	107	12	4	6	4	0	0
A9(T), south west of Poles	12	21	4	4	0	4	0	0
A9(T), south of Dornoch Bridge	12	21	4	4	0	4	0	0
A9 (T), Morangie	12	21	45	93	0	4	0	82
A9 (T), south west of Nigg Roundabout	12	21	45	93	0	4	0	82
A9 (T), south west of Kildary	12	21	45	93	0	4	0	82
A9 (T), Tomich	12	21	45	93	0	4	0	82
A9 (T), south of Brora	0	0	0	0	0	0	0	0
A949, west of Whiteface	0	0	45	92	0	0	0	0

Please note minor variances due to rounding may occur.

Table 12.21: Combined Scheme Sensitivity Review Peak Traffic Summary

Survey Location	Cars & Lights	HGVs	Total	Cars & Lights % Increase	HGVs % Increase	Total Traffic % Increase
A836, south of junction with A838	125	135	260	92%	735%	219%
A836, Achinduich	886	199	1,084	9%	168%	23%
A836, north Bonar Bridge	1,036	190	1,226	3%	121%	13%
A836, Ardgay	1,779	315	2,094	5%	167%	15%
A839, north west of Pittentrail	1,793	341	2,134	3%	137%	13%
A9(T), south west of Poles	876	153	1,029	4%	297%	16%
A9(T), south of Dornoch Bridge	3,421	907	4,328	0%	3%	1%
A9 (T), Morangie	6,288	850	7,139	0%	3%	1%
A9 (T), south west of Nigg Roundabout	7,041	1,567	8,608	1%	15%	3%
A9 (T), south west of Kildary	7,637	2,126	9,763	1%	10%	3%
A9 (T), Tomich	7,487	2,001	9,489	1%	11%	3%
A9 (T), south of Brora	8,598	2,057	10,654	1%	11%	2%
A949, west of Whiteface	3,686	889	4,575	0%	0%	0%
A949, west of Whiteface	1,022	147	1,169	5%	168%	13%

Please note minor variances due to rounding may occur.

- 12.167 **Table 12.21** shows that there are slight increases in total and HGV flows when considering all four schemes being constructed concurrently compared to the percentage increases associated with the proposed development being constructed alone (see **Table 12.17**).
- 12.168 Based on the road capacity results shown previously in **Table 12.18**, there would still be no road capacity issues should the proposed development and other schemes be constructed at the same time, with ample spare capacity within the study area road network to accommodate construction phase traffic.
- 12.169 The Applicant would welcome the opportunity to engage with other developers in consultation with THC to ensure appropriate traffic management measures would be implemented to minimise any cumulative impacts. In the event of all the sites being constructed at the same time it is suggested this would be mitigated through the use of an overarching TMMP for all of the sites and by introducing a phased delivery plan which would be agreed with THC and Police Scotland.
- 12.170 Furthermore, it is not predicted that the potential traffic flow increases would ever occur on the study area, as it is extremely unlikely that the peak traffic conditions will occur at

the same time due to differences in construction programmes, material supplies and developer resources. In addition, those schemes already consented will likely begin construction prior to the Proposed Development gaining planning consent.

Residual Effects

- 12.171 An evaluation of the potential effects of the increase in traffic on the study area roads used for construction traffic was undertaken. The summary of this assessment is provided in **Table 12.22**.
- 12.172 No road capacity issues are predicted within the study area during the construction phase.
- 12.173 Significant effects were identified for users and residents of the A838. These effects can be mitigated against through the introduction of a CTMP. These effects would be reduced to non-significant following the introduction of the proposed mitigation measures.
- 12.174 It should be acknowledged that the assessment has focussed on the peak in construction traffic activities and that the percentage increases on the A838 are high, given the existing relatively low level of total and HGV traffic.
- 12.175 The construction period is transitory in nature and all impacts would be short lived and temporary. No significant residual effects are predicted during construction.
- 12.176 The assessment confirms the effects would be minor in nature and they would not be significant. The traffic effects are transitory in nature. No long-lasting detrimental transport or access issues are associated with the construction phase of the proposed development.

Construction Residual Effects

- 12.177 This section considers the assessment of traffic effects following the incorporation of the mitigation measures identified above. Effects during the operational and decommissioning phases were scoped out of the assessment, which therefore only considers those arising during the construction phase.
- 12.178 **Table 12.22** summarises the assessment of residual effects identified in the evaluation with mitigation in place.

Table 12.22: Summary of Residual Effects

Receptor and Summary of Predicted Effect	Significance	Mitigation Measures	Residual Impact
A838 Users and Residents			
Severance	Significant	CTMP – Temporary signage / route signage	Not significant (Slight)
Driver Delay	Significant	CTMP – Temporary signage / route signage	Not significant (Slight)

Receptor and Summary of Predicted Effect	Significance	Mitigation Measures	Residual Impact
A838 Users and Residents			
Pedestrian Delay	Not Significant	CTMP – Temporary signage / route signage	Not significant (Slight)
Non-motorised User Amenity	Not Significant	CTMP – Temporary signage / route signage	Not significant (Slight)
Fear & Intimidation	Significant	CTMP – Temporary signage / route signage	Not significant (Slight)
Road Safety	Significant	CTMP – Temporary signage / route signage	Not significant (Slight)
Large Loads	Significant	AIL TMP	Not significant (Slight)

Summary

- 12.179 The proposed development would lead to a temporary increase in traffic volumes on the study road network during the construction phase. Traffic volumes would decrease considerably outside the peak period of construction.
- 12.180 The maximum traffic impact associated with construction is predicted to occur in Month nine of the programme. The greatest impact would occur at the site access where an additional 178 trips (60 Cars & Lights and 118 HGVs) are included to the network.
- 12.181 Total traffic movements will increase by approximately 219% on the A838, near the Site Access. Whilst this increase could be considered high, it is generally caused by relatively low traffic flows on the road at this location which will see an increase of 178 daily traffic movements. This represents approximately 15 movements per hour on the A838 during construction activities (on a typical weekday (Mon-Fri 08:00-19:00 and Sat 08:00-13:00)), which is not considered significant in terms of overall traffic flows.
- 12.182 HGV traffic movements will increase by over 30% at the following locations:
- the A838, near the Site Access (735% increase);
 - the A836, south of junction with A838 (160% increase);
 - the A836, Achinduich (114% increase);
 - the A836, north Bonar Bridge (83% increase);
 - the A836, Ardgay (68% increase); and
 - the A839, north of Pittentrail (276% increase).

- 12.183 While the increase in flows at these locations are statistically significant, it is generally caused by relatively low total flows along the road links which will see less than ten additional journeys every hour which is not considered significant in terms of overall traffic flows.
- 12.184 No road capacity issues are expected on any of the roads within the study area due to the additional construction traffic movements associated with the proposed development as background traffic movements are low.
- 12.185 The assessment of significance suggests that A838 Users / Residents are considered likely to experience overall significant effects in accordance with the EIA Regulations, prior to the application of mitigation measures.
- 12.186 The construction effects on the A836 Users / Residents, A839 Users / Residents, Lairg Residents and Rogart Residents are considered mainly Slight and not significant.
- 12.187 Traffic levels during the operational phase of proposed development would be approximately two vehicles per week for maintenance purposes. Traffic levels during the decommissioning of the proposed development are expected to be lower than during the construction phase as some elements could be left in situ and others broken up on-site.
- 12.188 The movement of AIL traffic would require small scale and temporary remedial works at a number of locations along identified delivery route which is presented in **Technical Appendix 12.1**.
- 12.189 AIL mitigation works can be designed to be temporary in nature to enable restoration to their original condition (if required by THC).

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Coille Linne Wind Farm

Environmental Impact Assessment Report Volume 1 Chapter 13: Socio-economics

June 2025

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13 SOCIO-ECONOMICS, RECREATION AND TOURISM

Introduction

This chapter considers the potential effects of Coille Linne Wind Farm (the 'Proposed Development') on Socio-economics, Recreation and Tourism.

- 13.1 This chapter should be read in conjunction with the description of the Proposed Development presented in Chapter 3: Project Description and with respect to relevant parts of other technical chapters, such as Chapter 6: Landscape and Visual, Chapter 11: Noise and Chapter 12: Traffic and Transport.
- 13.2 The author of this chapter, Emily Bonnett BA (Hons), is a registered EIA Practitioner with the Institute of Environmental Management and Assessment (AEMA) with 1.5 years of relevant experience in the preparation of EIA Reports in the energy sector, including a selection of wind farms across Scotland. The Technical Reviewers of this chapter were Sara Jarrett (BA hons) with 17 years of experience in socio-economic impact assessment and Neil Marlborough (BA (Hons), DipTP, MRTPI, with 20 years of experience of socio-economic assessment for onshore wind farms. The assessment has been informed by the other associated topic assessments within the EIA. The competence of those topic assessors is set out in each of their relevant chapters.

Legislation, Policy and Guidance

Legislation

- 13.3 The Land Reform (Scotland) Act 2003 (as Amended 2016)ⁱ provides a right of access for walkers, horse-riders and cyclists to most land and inland water. These legal rights are based on the principle of responsible access, with obligations both on the access users and on the managers of the land.
- 13.4 The legislation also states that local authorities should develop a Core Paths plan to establish and designate a network giving the public reasonable access throughout their area. Such a system of paths may include footways, footpaths, cycle tracks and bridleways. Rights of access and Core Paths are considered as part of the recreation and tourism assessment within this chapter.

Policy

- 13.5 Chapter 5: Renewable Energy and Planning Policy of the EIA Report sets out the planning policy framework that is relevant to the EIA process and the proposed development. Relevant policies such as the Highland Council Local Development Plan (LDP) are set out below.

National Planning Framework 4ⁱⁱ

- 13.6 The Fourth National Planning Framework (NPF4) is the national spatial strategy for Scotland. It sets out Scotland's spatial principles, regional priorities, national developments and national planning policy. The revised draft NPF4 and associated regulations were formally adopted by the Scottish Government in February 2023.
- 13.7 The NPF4 (National Planning Framework 4) (2023) policies of relevance to the Socio-economics, Recreation and Tourism assessment are:
- Policy 21: Play, Recreation and Sport;
 - Policy 25: Community Wealth Building;
 - Policy 26: Business and Industry; and
 - Policy 30: Tourism

Scotland's Economic Action Plan (2019/20)ⁱⁱⁱ

- 13.8 The Scottish Government's Economic Action Plan for 2019/20 outlines the Scottish Government's plans to improve productivity and competitiveness in Scotland with the aim of making Scotland a leader in technological and social innovations. Additionally, the plan sets out how Scotland will transition to a carbon neutral economy while utilising the economic opportunities for Scotland presented by the transition.
- 13.9 The main outcome of the action plan is sustainable inclusive growth in Scotland, which would combine the goal of increasing prosperity with improving equity.

The Highland-Wide Local Development Plan^{iv}

- 13.10 The Highland-wide Local Development Plan sets out a strategy for the growth of all communities across The Highland Council area, whilst placing an emphasis on sustainability. The plan recognises the tourism sector's significant contribution to The Highland Council economy and considers tourism-related and business development throughout.
- 13.11 The Highland-wide Local Development Plan policies of relevance to the Socio-economics, Recreation and Tourism assessment are:
- Policy 67: Renewable Energy Development – requiring that the (in the context of renewable energy developments) the council will consider any positive or negative effects it is likely to have on the local and national economy.
 - Policy 77: Public Access – requiring developments which affect any Core Path or wider access rights, to maintain or enhance any existing path including its amenity value, or ensure alternative access provision is provided which is no less attractive, is safe and convenient for public use.
 - Policy 78: Long Distance Routes - seeking to safeguard and enhance long distance routes, and their settings.

Guidance

- 13.12 There is no specific guidance available on approaches to assessing the impacts of a proposed onshore windfarm development on socio-economics, tourism and recreation. The methodology used has been based on professional experience, accepted practice, and draws upon industry reports on the sector.

Consultation

- 13.13 As part of the Scoping exercise, a consultation exercise was undertaken to inform the design of the proposed development and to seek agreement on potential significant environmental effects that result from the proposed development as well as the scope of any assessment work required as part of this EIA.
- 13.14 The Scoping Opinion was received from Highland Council on the 13th of September 2024.
- 13.15 Consultation relevant to the Socio-economics, Recreation and Tourism assessment was undertaken with the Highland Council who commented on aspects of methodology, sources of information, scope of assessment and cumulative development. A summary of these consultation responses is provided in Table 13.1.

Table 13.1: Consultation Response

Consultee	Date Received	Consultation Response	Where and how is this addressed?
The Highland Council	13/09/2024	"We consider that Socio-Economic, Tourism and Recreational impacts should be considered ... to ensure that these matters are appropriately addressed."	This chapter, Chapter 13: Socio-economics, Recreation and Tourism, considers effects to human receptors as part of this EIA Report.
The Highland Council	13/09/2024	"The assessment should estimate who may be affected by the development, in all or in part, which may require individual households to be identified, local communities or a wider socio economic groupings such as tourists and tourist related businesses, recreational groups, economically active, etc."	The Baseline section of this chapter identifies and reports on various groups, including the socio-economic status of the Highland population, and users of recreational and tourism receptors. Local economic and employment information is only available down to a Highland Council level and therefore no further local considerations can be included on these topics.
The Highland Council	13/09/2024	"The application should include relevant economic information connected with the project, including the potential number of jobs, and economic activity associated with the procurement, construction, operation and	Estimated capital expenditure, local spending, and employment generation are calculated during construction and operation under the 'Identification and Evaluation of Key Effects' section of this chapter.

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		decommissioning of the development."	
The Highland Council	13/09/2024	"Any mitigation proposed should also address impacts on the regional and local economy."	A local community funding scheme will be delivered during the operation phase of the proposed development. Such funding aims to spread benefits to the local community to support a diverse range of activity to improve the daily lives of local people.

Assessment Methodology and Significance

Scope of Assessment

- 13.16 There is no established guidance for conducting a socio-economic assessment as part of the EIA process. It is therefore proposed that the assessment uses desk-based information sources to assess the likely scale of effects, supplemented by consultation with local stakeholders. Cross reference would be made to other technical assessments to consider potential effects on recreational assets and other leisure and tourism attractions in the surrounding area, for example due to visual impact, traffic, and noise.

Effects Assessed in Full

- 13.17 The following effects were considered to be potentially significant in relation to socio-economics, recreation and tourism at the scoping stage and have been assessed in full within this chapter:
- There is potential for significant positive socio-economic effects both in construction and operation. A socio-economic assessment would be included.
 - Potential effects upon tourism and recreation and land management practices would be considered within the assessment.
 - There is also potential for significant effects in relation to tourism and recreation during operation of the proposed development, and therefore both are scoped into assessment.

Effects Scoped Out

- 13.18 Human health would not be directly affected by the proposed development during construction or operation given the nature of the proposed development and its rural location. Factors indirectly associated with human health such as visual impact or noise would be dealt with in the respective chapters as already outlined.

Study Area

- 13.19 There are no recognised standards or methodologies for assessing the socio-economic, recreation and tourism effects of windfarms, and the Study Areas have been defined based on professional judgement.
- 13.20 The 'local level' Study Area for the socio-economic assessment is the administrative area of The Highland Council. Scotland is the 'national level' Study Area for the assessment of socio-economics impacts.
- 13.21 The tourism and recreation assessments focus on a 5km Study Area, in order to capture the receptors most likely to be affected by the Proposed Development. The Study Area is based on the distance between the Site Boundary and receptor. Receptors outside these Study Areas have been considered in the scoping exercise if a significant effect on tourism and recreation was anticipated.

Desk Based Study and Data Sources

- 13.22 The assessment includes an extensive review of information sources to establish the socio-economic status of the local population, and to identify current tourism and recreation businesses and resources as well as tourism and recreational activities in the Study Area. The assessment uses standard socio-economic and demographic data from available datasets, including the 2011 census and 2021 census where available, NOMIS (the Office for National Statistics website), standard sources of tourist and visitor data found on Visit Scotland's website, and other individual research reports.

Field Survey

- 13.23 No site-specific field survey work has been undertaken by the Applicant for this socio-economic assessment.

Assessment Methodology and Significance Criteria

- 13.24 The generic project-wide approach to the assessment methodology is set out in Chapter 2: EIA Methodology. However, whilst this has informed the approach that has been used in this socio-economic, recreation and tourism assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this socio-economic, recreation and tourism assessment.
- 13.25 This socio-economic, recreation and tourism assessment follows the approach set out in the Scoping Report submitted in June 2024 and conforms with the subsequent Scoping Opinion issued by Scottish Ministers (September 2024). In doing so, it takes into consideration associated consultation responses from statutory and other consultees.

Assessment of Significance

Sensitivity

- 13.26 Sensitivity criteria in terms of employment, economy and land use are shown in Table 13.2 below.

Table 13.2: Sensitivity Criteria

Sensitivity	Definition and Examples
Very High	Employment – Where there is the requirement for very technical specialist input, which is difficult to source at a national level and/or there is very low labour or skills at a local level. Economy and land use – Where the economy or land uses have no realistic capacity to manage adverse changes to their operations. Tourism/recreation: Where the receptor or resource is defined as being of National (UK) status.
High	Employment – Where there is some requirement for technical specialist input, which is difficult to source at a national level and / or where there is limited labour or skills available at the local level. Economy and land use – Where the economy or land uses have little capacity to manage adverse changes to their operations. Tourism/recreation: Where the receptor or resource is defined as being National (Scotland) status.
Medium	Employment – Where there is limited requirement for very technical specialist input, which is difficult to source at a national level, and or where there are some constraints to the availability of labour or skills at the local level. Economy and land use – Where the economy or land uses have capacity to manage adverse changes to their operations. Tourism/recreation: Where the receptor or resource is defined as being of regional status.
Low	Employment – Where there no requirement for technical specialist input, and / or where there is a readily available labour force and skills. Economy and land use – Where the economy or land uses have substantial capacity to manage adverse changes to their operations. Tourism/recreation: Where the receptor or resource is defined as being of local status.

Magnitude

13.27 The definitions describing the magnitude of change are shown in Table 13.3 below.

Table 13.3: Magnitude of Effect

Magnitude	Criteria
Very High	An impact that would be very adverse/beneficial and is very likely to affect the operations of businesses, tourist attractions or existing land or recreational users.
High	An impact that would be adverse/beneficial and is likely to affect the operations of businesses, tourist attractions or existing land or recreational users.
Medium	An impact that would be adverse/beneficial and that may have some effect on the operations of businesses, tourist attractions or existing land or recreational users.
Low	An impact that is anticipated to have a slight effect on (either adversely or beneficially) and is unlikely to have any effect on the operations of businesses, tourist attractions or existing land or recreational users.

Significance of Effects

13.28 Major effects are considered significant in EIA terms. Moderate, minor and negligible effects are not considered significant in EIA terms. In addition, if no effects are found, this will be stated and will also be not significant. Table 13.4 below shows how magnitude of change and sensitivity criteria are considered together to determine significance.

Table 13.4: Significance Evaluation Matrix

Sensitivity	Magnitude of Change			
	Very High	High	Medium	Low
Very High	Major (Significant)	Major (Significant)	Moderate (Not significant)	Minor (Not significant)
High	Major (Significant)	Major (Significant)	Moderate (Not significant)	Minor (Not significant)
Medium	Major (Significant)	Major (Significant)	Moderate (Not significant)	Minor (Not significant)
Low	Moderate (Not significant)	Moderate (Not significant)	Minor (Not significant)	Negligible (Not significant)

Assumptions and Limitations

13.29 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- Baseline data has been collected through desk-based study using publicly available sources; and
- Information presented in this EIA Report has been based on the project information that was available at the time of writing.
- Any further assumptions and limitations encountered during the assessment process will be set out in the EIA Report.

Baseline Conditions

13.30 This section sets out the current baseline for this socio-economic assessment and the key receptors against which the proposed development has been assessed. These subjects considered within the baseline conditions are:

- Employment and Economy; and
- Tourism and Recreation.

13.31 Information is also provided in this baseline section about the renewables industry and public attitudes to wind farms in relation to tourism and recreation.

Renewable Energy Industry

Manufacturing & Supply Chain

13.32 There are currently no operational manufacturing plants in Scotland which specialise in the production of onshore turbine towers or major turbine components, with the most likely location for turbine manufacturing coming from elsewhere in northern Europe. The turbine blades will be delivered from either Invergordon or the Port of Nigg in Tain, both located to the southeast of the Site.

13.33 There are also businesses across Scotland that are involved in developing secondary components for wind turbines, however these components are not required solely for wind turbines.

Employment & Investment

13.34 In December 2023, Scottish Renewables published a report entitled 'The Economic Impact of Scotland's Renewable Energy Sector' by Fraser of Allander Institute, which demonstrates that in 2019 there were 42,000 FTE.

13.35 Equivalent (FTE) posts within Scotland's renewable energy sector. This included 10,120 posts within the onshore wind subsector. Scottish Renewables recognises that it is important to note that the ONS survey data on the activities of these individual technologies in Scotland has low sample sizes and therefore comes with wide confidence intervals. These results should only be used to provide a sense of magnitude. These figures should not be used to track performance of these technologies over the short term as the margin of error on the underlying data is likely to exceed any short-term changes. There are likely to be organisations who were not included and who are either directly active in, or supply services to the renewable energy sector in Scotland. Nonetheless, these statistics

demonstrate the national and regional employment significance of both the renewables sector generally, and specifically the onshore wind industry.

- 13.36 In September 2019, as part of the Scottish Renewable Energy Festival^{vi}, Scottish Renewables released a document which set out the contribution of renewable energy to innovation, jobs, communities, climate and the rural economy. The report revealed that in 2017, the renewable energy sector employed 17,700 people in Scotland, a number likely to increase as the Committee on Climate Change has calculated that Scotland must quadruple the amount of electricity it produces to meet its net-zero target. The 17,700 included 5,800 jobs in the onshore wind sector.
- 13.37 In October 2022, Scottish Renewables, with the Fraser of Allander Institute, published 'The Economic Impacts of Scotland's Renewable Energy Sector – 2022'^{vii}. This outlined the economic impacts of Scotland's renewable energy industry, estimating that "the renewable energy industry supports over £5.6 billion of output, over £2.5 billion of GVA and over 27,000 FTE Employment across the Scottish economy". The report defined onshore wind as supporting the most FTE employment at 10,120 FTE.
- 13.38 The 9,300 FTE increase in renewable energy from 2017 to 2022 highlights a trend predicted by the Committee on Climate Change, as they calculated that Scotland must significantly increase the amount of electricity it produces to meet its net-zero target^{viii}.
- 13.39 A report on UK Onshore Wind, the Direct & Wider Economic Impacts, concludes that 98% of development, 45% of construction, and 90% of operation and maintenance expenditure currently occurs in the UK^{ix}.
- 13.40 From a detailed economic analysis of onshore wind case studies, the report concludes that for each 1MW of installed capacity, 69% of total expenditure takes place within the UK. This takes account of the following reported expenditure in the UK: 98% of development; 48% of construction; and 87% of operation and maintenance costs. The report also calculates that the medium-large subsector of the onshore wind market contributes 13,600 jobs and £906 million in gross value added (GVA) to the UK economy.
- 13.41 The BEIS report, Electricity Generation Costs 2020^x estimates that by 2025, total capital costs for onshore wind farms will be around £1m per MW installed, and there will be operating expenditure of around £25,900 per year, per MW installed.
- 13.42 The Onshore Wind Policy Statement^{xi} produced by the Scottish Government in 2017 indicated that the onshore wind sector is a 'vital component of the huge industrial opportunity that renewables more generally create for Scotland'. The onshore wind sector supports an estimated 7,500 jobs in Scotland.
- 13.43 Renewable UK published a report 'Working for a Green Britain and Northern Ireland'^{xii} in September 2013 which stated that employment in wind, wave and tidal energy sectors now directly employs 18,465 people full time, an increase of 74% since 2010, with the largest increase for offshore wind where the number of direct jobs doubled between 2010 and 2013. The report also showed that 91% of the employees in the UK wind and marine energy industry are UK citizens, while also showing that small and medium enterprises make up the heart of the sector and are driving the growth in employment with more than 80%

of employers in the sector employing fewer than 250 people and with 56% employing fewer than 25 people. The report also predicted that over 70,000 jobs could be created over the next decade. Of the 18,465 people directly employed, 54% were in relation to onshore wind with 36% relating to large onshore wind. Scotland accounts for 3,827 jobs, approximately 20% of the sector, which while lower than the total number of direct jobs in England, accounts for a higher proportion of total employment in Scotland (also higher than Wales and Northern Ireland).

- 13.44 Vivid economics produced a report for Renewable UK^{xiii} in June 2019 quantifying the benefits of onshore wind to the UK. Deploying 35GW of onshore wind by 2035 could reduce UK electricity costs by 7%, support 31,000 jobs, lift productivity throughout the UK and enable a £360m export industry.
- 13.45 This report notes that the Committee on Climate Change (CCC) recommended that the UK government adopt a net zero emissions target by 2050, which would require a significant acceleration of onshore wind deployment. This recommendation was accepted by the UK Government and Parliament has now legislated to set the 2050 net zero target through the Climate Change Act 2008 (2050 Target Amendment) Order 2019.
- 13.46 Onshore wind is the cheapest low-carbon generation technology available. In order to reach net zero greenhouse gas emissions at least by 2050, the UK could need up to 35GW of onshore wind capacity by 2035^{xiv}. This would require the deployment of 1.4GW of onshore wind annually, a significant increase on the modest 0.5GW deployed in 2023^{xv}. Beyond reducing emissions, accelerating deployment in line with CCC net zero recommendations would result in a series of socioeconomic benefits to the UK, including:
- 7% reduction in electricity costs, saving households £50 per year;
 - £360m in exports annually by 2035;
 - 14,000 direct jobs and 17,000 indirect jobs; and
 - Productivity uplift throughout the UK.
- 13.47 The 14,000 jobs referenced above would be a threefold increase on current levels. The Office of National Statistics (ONS) estimates that there are 5,300 direct onshore wind jobs across the UK today. This number could nearly triple under a CCC-consistent deployment scenario, driven by an increase in development, manufacturing and installation jobs to around 7,200 in 2035. Operations and maintenance jobs are expected to increase steadily to around 3,000 in 2035 as the expenditure needed to operate and maintain onshore wind farms increases with deployment levels. To a lesser degree, these increases are driven by an increase in UK wind farm developments from 66% today to a target of 70% by 2030. Jobs from exports could reach 3,700 by 2035 as the UK lifts exports from £53m today to £360m in 2035.
- 13.48 This report also notes that the onshore wind industry could support up to 31,000 direct and indirect jobs by 2035. Today, the ONS estimates that each direct onshore wind job supports 1.24 indirect jobs, and that the onshore wind industry supports 12,200 direct and indirect jobs. Deploying 35GW by 2035 could increase direct and indirect jobs steadily to 2030, followed by more modest job growth between 2030 and 2035. This modest growth in jobs is driven by a deceleration in onshore wind capacity additions in the EU27 (the 27 European countries), a key export market.

- 13.49 The Economic Impact of Scotland's Renewable Energy Sector was commissioned by Scottish Renewables in June 2021. The report notes that the true economic impact of the renewables industry is not just the activity of the industry itself but also includes the activity that it generates in its supply chains. The report finds that Scotland's renewables sector has a turnover of £2.8billion and 6,440 full-time equivalent employment.
- 13.50 The report surmises that, including spillover effects, such as employees spending their wages in the Scottish economy, Scotland's renewable activities support £5.2bn of output, £2.3bn of GVA and 22,660 FTE employment in the Scottish economy.

Employment and Economy

- 13.51 Table 13.5 below shows Economic Activity Rates in The Highlands^{xvi}. A total of 78.4% of those of working age are economically active, which is higher than the equivalent figure for Scotland as a whole (77.3%) and identical to Great Britain. There are more males who are economically active than females, which is consistent with Scotland and Great Britain as a whole. As a consequence of the high levels of economic activity, the unemployment rates are lower, for both males and females.
- 13.52 Fewer males are economically active in The Highlands than for Scotland and Great Britain as a whole but only by 2.5%. Females are more economically active in The Highlands than in both Scotland and Great Britain.

Table 13.5: Economic Activity Rates in The Highlands

	Highland (Numbers)	Highland (%)	Scotland (%)	Great Britain (%)
All People				
Economically Active	125,700	78.4	77.3	78.4
In Employment	125,700	78.4	74.5	75.5
Employees	105,800	68.5	66.1	66.1
Self-Employed	18,000	9.0	8.2	9.2
Unemployed	3,400	2.6	3.5	3.7
Males				
Economically Active	68,300	78.9	79.7	82.2
In Employment	68,300	78.9	76.4	78.8
Employees	54,800	65.4	65.8	66.8
Self-Employed	11,700	11.9	10.2	11.8
Unemployed	N/A	N/A	4.0	4.0
Females				
Economically Active	57,300	77.8	75.0	74.7
In Employment	57,300	77.8	72.8	72.1
Employees	51,000	72.1	66.4	65.4
Self-Employed	6,300	Sample size too small	6.2	6.6

	Highland (Numbers)	Highland (%)	Scotland (%)	Great Britain (%)
All People				
Unemployed	N/A	N/A	2.9	3.4

- 13.53 Table 13.6 below shows that the biggest occupation for employment in The Highlands is professional occupations which accounts for 20.2% of those in employment, followed by elementary occupations (14.8%) and then associate professional and technical occupations (11.4%). Professional occupations is a lower percentage than the equivalent for Scotland as a whole (26.0%), but there are more people for Scotland as a whole employed in associate professional and technical occupations.

Table 13.6: Employment by Occupation in The Highlands

	Highland (Numbers)	Highland (%)	Scotland (%)	Great Britain (%)
Soc 2010 Major Group 1-3	52,100	42.5	50.0	52.9
1 Managers, Directors And Senior Officials	12,500	9.9	8.3	11.0
2 Professional Occupations	25,400	20.2	26.0	26.6
3 Associate Professional & Technical	14,300	11.4	15.5	15.3
Soc 2010 Major Group 4-5	22,500	18.4	18.9	18.2
4 Administrative & Secretarial	9,900	7.9	15.8	14.6
5 Skilled Trades Occupations	12,700	10.1	9.3	8.7
Soc 2010 Major Group 6-7	19,900	16.3	15.8	14.6
6 Caring, Leisure And Other Service Occupations	12,100	9.6	9.4	8.4
7 Sales And Customer Service Occupations	Sample size too small	Sample size too small	6.3	6.2
Soc 2010 Major Group 8-9	28,000	22.8	15.3	14.3
8 Process Plant & Machine Operatives	9,400	7.5	5.4	5.4
9 Elementary Occupations	18,600	14.8	9.8	8.9

- 13.54 Table 13.7 below shows employee jobs by industry. The dominant industries for employment are Human Health and Social Work Activities (17.1%) wholesale and retail trade; repair of motor vehicles and motorcycles (14.4%) and then accommodation and food service activities (13.5%). Accommodation and food service activities in particular is

much higher in The Highlands than the equivalent figures for Scotland (8.4%) and Great Britain (8.0%) as a whole. Education and professional, scientific, and technical activities also provide high numbers of employment.

Table 13.7: Employment by Industry in The Highlands

Employee Jobs by Industry	Highland (Numbers)	Highland (%)	Scotland (%)	Great Britain (%)
B : Mining And Quarrying	400	0.4	1.0	0.2
C : Manufacturing	6,000	5.4	6.9	7.6
D : Electricity, Gas, Steam and Air Conditioning Supply	1,000	0.9	0.8	0.4
E : Water Supply; Sewerage, Waste Management and Remediation Activities	2,250	2.0	0.7	0.7
F : Construction	8,000	7.2	5.7	4.9
G : Wholesale And Retail Trade; Repair of Motor Vehicles And Motorcycles	16,000	14.4	12.9	14.0
H : Transportation And Storage	4,500	4.1	4.1	5.0
I : Accommodation And Food Service Activities	15,000	13.5	8.4	8.0
J : Information And Communication	2,500	2.3	3.2	4.5
K : Financial And Insurance Activities	900	0.8	3.3	3.3
L : Real Estate Activities	1,500	1.4	1.3	1.9
M : Professional, Scientific And Technical Activities	6,000	5.4	7.4	9.1
N : Administrative And Support Service Activities	6,000	5.4	8.1	9.0
O : Public Administration And Defence; Compulsory Social Security	6,000	5.4	6.5	4.7
P : Education	9,000	8.1	8.8	8.6
Q : Human Health And Social Work Activities	19,000	17.1	15.7	13.5
R : Arts, Entertainment And Recreation	4,000	3.6	3.0	2.4

Employee Jobs by Industry	Highland (Numbers)	Highland (%)	Scotland (%)	Great Britain (%)
S : Other Service Activities	1,500	1.4	1.6	2.0

- 13.55 The level of earnings is an important indicator of the general health of the local economy but also reflects economic activity in the area. In general, higher earnings indicate a prosperous economy comprised of sectors that pay well, whilst low earnings indicate the opposite. Gross weekly pay (median earnings for employees living in the area) in The Highlands is £664.4, lower than that for Scotland (£702.8) and Great Britain (£682.6). Full time male workers receive considerably more weekly pay in The Highlands than females - £695.2 compared to £606.1.
- 13.56 Table 13.8 below shows that 21.6% of the population is economically inactive, lower than for Scotland (22.7%) and identical to Great Britain (21.6% as a whole). Those looking after family, followed by long term sick and students make up the majority of those who are economically inactive.

Table 13.8: Economic Inactivity in The Highlands

	Highland (Numbers)	Highland (%)	Scotland (%)	Great Britain (%)
Total	31,400	21.6	22.7	21.6
Student	Sample size too small	Sample size too small	24.6	26.8
Looking After Family/Home	Not available	Not available	16.1	18.9
Temporary Sick	Not available	Not available	2.8	2.0
Long-Term Sick	16,300	51.9	32.0	28.1
Discouraged	Not available	Not available	0.5	0.4
Retired	Sample size too small	Sample size too small	14.5	12.9
Other	Sample size too small	Sample size too small	9.5	11.0

- 13.57 The BEIS report 'The Size and Performance of the UK Low-Carbon Economy^{xvii} identifies that the low carbon employment sector accounted for 44,800 jobs in Scotland in 2013 of which 19,000 were within the onshore wind energy subsector.
- 13.58 The Scottish Government Publication Businesses in Scotland^{xviii} provides information on the number of enterprises operating in Scotland. For the Highlands in 2018, there were 11,440 businesses with a total employment of 86,270 and total turnover for that year of £9,753 million pounds, which is a 0.9% decrease in turnover from the previous year.

Tourism and Recreation

Tourism - Economics

- 13.59 The significance of tourism in the Highlands is high – in 2021 the tourism sector employed 19,245 individuals in the Highlands, making up 15.0% of Total Employment. This is the largest employment sector within this local authority. This is much greater than the rest of Scotland where the tourism industry employs 227,975 individuals, which makes up 8.9% of Total Employment. Tourism sustains some of the most remote and rural populations, providing essential employment opportunities and attracting investment.
- 13.60 In 2023, there were 2,285,000 total overnight visits by domestic and international visitors to the Highlands where 7.64 million total nights were spent in accommodation. The average overnight visitor spent £333^{xix} (per night stay).
- 13.61 In 2018, overnight tourists and day visitors had combined spending of around £10.4 million. This generated around £12 billion of economic activity in the wider Scottish Economy and contributed around £7 billion to Scottish GDP^{xx}.
- 13.62 In 2021, due to the COVID-19 pandemic the number of international visitors to Scotland dropped by 86% to 479,000 visits and expenditure dropped by 82% to reach £459 million when compared to the 2019 statistics^{xviii}.
- 13.63 The COVID-19 pandemic had a significant impact on tourism within the Highlands. An FSB Highlands & Islands Tourism and Hospitality Survey report from 2021 states that “With an average pre-COVID visitor spend of £1.5bn in the region [HIE Area], 3,200 registered tourism businesses locally, and with tourism jobs representing up to 43% of the workforce in some areas, tourism is central to Highlands and Islands life. It sustains many of our local, regional and island economies and communities.” Research found that the visitor spend in the region is likely to have declined by up to £584 million in the financial year 2020 – 2021. However, a following survey conducted in January 2021 by FSB found that 54% of Highland businesses were closed at the time, 45% of which were required to by law. This was significantly higher than 35% nationally and 27% for Edinburgh and Glasgow combined^{xviii}.
- 13.64 The Scottish tourism industry has shown a strong recovery since the COVID-19 pandemic. In 2023, Scotland saw a total of 109 million tourism visits, including both domestic and international overnight trips and day visits. This is a greater value than 2019 and 2022 and was the first year that international expenditure accounted for over 53% of total overnight expenditure. The sector generated £10.8 billion in total visitor spend^{xxi}.

Tourism – Visitor Attractions

- 13.65 Core paths and other walking routes are important for recreational purposes. However, no core paths are present within the Study Area. There may be non-designated paths that are used by tourists within the Study Area.
- 13.66 In accordance with the Land Reform (Scotland) Act (2016) walkers, horse-riders and cyclists are able to access most areas within Scotland, including the area within the Site

Boundary and wider Study Area. Due to this, wild camping could also occur within the Site Boundary and Study Area.

- 13.67 Scotland also provides a diverse range of fishing opportunities, in particular, the chance to fish for migratory sea trout and Atlantic salmon. Loch Shin, located southwest of the Red Line Boundary, is well known for brown trout and salmon fishing. It is home to Lairg Angling Club.
- 13.68 Deer stalking is a century old tradition in the Highlands, attracting visitors throughout the year to hunt various species of deer. There is also potential deer stalking and shooting activity in the area surrounding the Site as well as deer shooting within the Site as part of routine land management activities.

Recreation

- 13.69 The Highlands, including the area around the site, is popular for a wide range of recreational pursuits, including walking, cycling, horse riding, golf, a variety of water sports, fishing and off-road driving. There are also opportunities to undertake parachute diving, flying, rock climbing, snow sports and country sports. Many of these activities also attract tourists, either as part of a wider holiday in the area, or in their own right.
- 13.70 There are no National Cycle Network Routes located within the Study Area.
- 13.71 The Site is subject to the 'right to roam' under the Land Reform (Scotland) Act 2003ⁱ such that access for recreation is permitted over the Site.

Future Baseline

- 13.72 From the information acquired for this assessment, there is no indication that the baseline is in the process of any significant transition and would be expected to remain largely as described above, without the proposed development taking place.

Identification and Evaluation of Key Effects

- 13.73 The predicted construction, operation, and decommissioning effects of the proposed development on the socio-economic receptors identified in this assessment are considered in further detail in the sections below.

Economy and Employment Effects - Construction and Decommissioning

- 13.74 Due to the similarities in activities between the construction and decommissioning phases, they are both considered within this section.

Economic Effects

- 13.75 The Review of Renewable Electricity Generation Cost and Technical Assumptions Study Report^{xiii} estimates the total capital cost of a wind farm in 2020 (construction and infrastructure provision, not pre-development planning, surveys etc.) would be around

£1.8m per MW installed (for a high capacity MW scheme). On the basis of 15 turbines with a power output of 108MW, these figures would provide a capital cost for the Proposed Development of around £194.4m. The BEIS report, Electricity Generation Costs 2020 estimates that by 2025, construction costs for onshore wind will be around £1m per MW. For the proposed development, this would equal around £108m.

- 13.76 The economic impact assessment set out within the O'Herlihy report (2006) splits construction spend by turbine manufacturing and construction and installations costs. The O'Herlihy report (2006) identifies that approximately 65% of the total capital spend for a proposed wind farm relates to the cost of manufacturing wind turbines, with the remaining 35% related to onsite construction (balance of plant) and installation work. The RUK Report (2015)^{xxiii} supports this analysis as it calculates that turbine manufacturing accounts for 64.4% of total capital expenditure, balance of plant contracts accounts for 28.6% and grid connections account for 7.1%.
- 13.77 Using an expenditure distribution profile of 35% for onsite construction works, the proposed development could therefore generate capital expenditure of approximately £31.5m.
- 13.78 The RUK (2015) report states that 12% of the total capital construction costs of an onshore wind farm are typically spent locally (within the local authority area). This would equate to approximately £3.78m to be spent within the Highland Council area.

Wind Farm Decommissioning

- 13.79 There would be further local spend at the stage that the Proposed Development is decommissioned, although these works are not as complex or expensive as construction activities. Once the blades and towers are lowered by specialists, the subsequent breaking up and removal of the towers, blades and other parts is likely to be undertaken by smaller contractors.
- 13.80 Wind farm decommissioning bonds currently estimate costs for decommissioning works and site restoration (leaving tracks in situ) in the order of £15,000 per MW. This would amount to around £1.6m for the proposed development.

Employment Effects

- 13.81 The RUK (2015)^{xxiii} report in Table 6: GVA and Employment Ratios (Construction Phase) estimates that the weighted average shows there is one employee per £137,942 in turnover. If replicated during the construction of the Proposed Development this could result in employment across the Highland Council area ranging at around 27 FTE (£3.78m ÷ £137,942).
- 13.82 In addition to the predicted employment levels calculated above, it is expected that further employment would be sustained or created through induced and indirect economic effects. This would be likely to occur through the supply chain and the impact of wages and salaries on the local economy. This would enable the retention of existing employment related economic benefits in the local economy. Figures from the ONS from 2017^{xxiv} identify a multiplier of 2.49 for employment in the onshore wind sector in Scotland. Therefore, every direct job supports 2.49 jobs in total, 1 for the direct job and 1.49 other

jobs. As a result, the construction phase would support approximately 68 FTE jobs in total in the local (Highland) economy.

Significance assessment

- 13.83 As noted above, the overall economy of the Highlands has a turnover of around £10,872m per annum and with total employment of 85,600, and could be considered to be of a medium sensitivity. The economic and employment effects from the proposed development at the Highland Council level is estimated to result in a Low magnitude of change, which would result in a Minor beneficial effect that is considered to be not significant. Within the energy sector of the Highlands, with a £765.4m annual turnover and with 3,000 employees, the beneficial effects will be more noticeable within this sector, but still of a low magnitude and not significant.

Economy and Employment Effects - Operation

Economics Effects

- 13.84 The Review of Renewable Electricity Generation Cost and Technical Assumptions Study Report^{xxi} estimates the operating costs of a wind farm in 2020 would be around £93,000 per year, per MW installed for a 50MW+ scheme. On the basis of 15 turbines with a power output of 108MW, these figures would provide an annual operating cost for the proposed development of around £10m, and a lifetime operating cost of around £351.5m. The BEIS report, Electricity Generation Costs 2020^{xxv} estimates that by 2025, operating costs for onshore wind will be around £23,500 per year, per MW installed. So for the proposed development, this would equal around £2.5m per year, or £88.8m over the lifetime of the development.
- 13.85 In terms of the geographical distribution of operations and maintenance expenditure, the RUK 2015 report states that 42% of expenditure occurs locally (local authority level). Therefore, it is predicted that the proposed development could result in approximately £195,300 in local spend each year (approximately £6.8m over the 35 year lifespan of the proposed development).

Employment Effects

- 13.86 There would be potential for both national and local employment for the maintenance of the proposed development. It is not anticipated that the proposed development would result in any job losses taking account of the current land use within the site and the not significant effect on tourism and recreation receptors as assessed below.
- 13.87 The BiGGAR (2015)^{xxvi} report estimates (Table 9: GVA and Employment Ratios (Operations and Maintenance)) that average total turnover per employee during the operational phase of a wind farm is £121,935. If replicated during the operational phase of the proposed development, this could result in total employment of approximately 1.6 FTE (£195,300 ÷ £121,395) per annum.

Significance Assessment

- 13.88 Overall, the operation of the proposed development is predicted to have a low beneficial magnitude of change on the economy and employment at the local Highland Council level. With the economy of the Highland Council area considered to be of medium sensitivity, this would result in a minor effect, which would be not significant.

Recreation and Tourism Effects – Construction and Operation

- 13.89 There is the potential for temporary adverse effects on the availability and accessibility to recreational destinations, recreational routes and activities during the construction of the Proposed Development. This is because the areas surrounding the construction and maintenance activities would be temporarily restricted and a forestry road will be used as a primary access road. In addition, access to recreational destinations and activities may be adversely affected by construction traffic and activities.
- 13.90 The Proposed Development could also have an adverse effect on amenity experienced by users of the recreational destinations, recreational routes and activities during construction and operation.
- 13.91 There is the potential for temporary adverse effects on tourism during the construction and operation of the Proposed Development. The construction and operation of the Proposed Development could affect the accessibility and amenity experienced by users of tourist attractions.
- 13.92 During the operational phase of the proposed development, the public would have unrestricted access to the site under the general 'right to roam' enshrined in the Land Reform (Scotland) Act 2003i. Temporary public access restrictions would only apply if it were necessary to undertake intensive maintenance or upgrading to on-site infrastructure including turbines and access tracks, in accordance with the CDM Regulations 2015. Therefore, there is considered to be no change to public access rights.

Mitigation Measures and Monitoring

- 13.93 The Applicant has pledged to provide local community funding which would be delivered during the operational phase of the Proposed Development. In accordance with the Scottish Government's Good Practice Principles for Community Benefits from Onshore Renewable Energy Developments document (2013, revised in 2019 for factual accuracy), this funding aims to ensure that local communities share the socio-economic benefits which would be generated from the Proposed Development. The Applicant is supportive of all potential uses of the community benefit package but recognises that it will be for local communities to decide on how to achieve the greatest benefits.

Cumulative Effects

- 13.94 Consideration has been given as to whether any of the socio-economic receptors that have been taken forward for assessment in this chapter are likely to be subject to cumulative socio-economic effects in combination with other developments. Other

relevant developments within The Highland Council area that have been considered for any cumulative effects have been identified in Chapter 6: Landscape and Visual.

Economy and Employment

- 13.95 The cumulative effects from other aspects found there to be no receptors within the study area with significant effects on economy and employment.

Recreation & Tourism

- 13.96 The cumulative effects from other aspects found receptors on the John o' Groats Cycle Route would experience significant landscape and visual effects during daylight hours on the section of the route that passes near Crask Inn to the east. This could impact recreation and tourism within the study area, as the reduced amenity of the Cycle Route could reduce the number of tourists using it. However, the magnitude of impact in comparison to the cycle route itself is minor. While there is a potential for a perceptible change in the recreational experience along this section of the John o' Groats Cycle Route, the overall effect on tourism and recreation is assessed as not significant.

Residual Effects

- 13.97 The assessments presented in this chapter demonstrate that the Proposed Development would result in beneficial economic and employment effects that are of a minor scale and would not be considered to be significant in EIA terms. Considering the Proposed Development together with existing wind farms nearby, it is considered that the cumulative economic effect would have a moderate and not significant beneficial effect.

Summary

- 13.98 Throughout this socio-economic, recreation and tourism assessment of the Proposed Development, no significant (beneficial or adverse) effects have been identified. Therefore, the Proposed Development is not anticipated to result in any material changes to the existing socio-economic, recreational, or tourism baseline conditions, and no further mitigation or enhancement measures are considered necessary.

References

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Coille Linne Wind Farm

Environmental Impact Assessment Report Volume 1 Chapter 14: Forestry

May 2025

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14 FORESTRY

Introduction

- 14.1 This chapter considers the potential effects of Coille Linne Wind Farm, the 'proposed development,' on forestry.
- 14.2 This chapter is also supported by the following figures as contained within EIA Report Volume 2: Figures:
- Figure 14.1: Baseline Forestry
 - Figure 14.2: With Wind Farm Felling
 - Figure 14.3: With Wind Farm Replanting
- 14.3 The chapter is supported by a number of Technical Appendices (as set out within Volume 4: Technical Appendices), comprising:
- Technical Appendix 14.1: Forest Data
 - Technical Appendix 14.2: Photographic Records
- 14.4 Other relevant chapters include
- Chapter 3: Project Description;
 - Chapter 6: Landscape and Visual;
 - Chapter 8: Ecology; and
 - Chapter 10: Geology, Hydrology and Hydrogeology.
- 14.5 The author of this Chapter, Neil McKay MICFor, is a chartered forester, a professional member of the Institute of Chartered Foresters since 1994. Neil McKay has more than 12 years of relevant experience in the preparation of Forestry Chapters as part of EIA Reports for a range of wind farms across Scotland.

Legislation, Policy and Guidance

Legislation

- 14.6 The scope of the assessment has been informed by consultation responses summarised in Table 14.1 and the following guidelines/policies:
- Forestry and Land Management (Scotland) Act 2018.
 - Forestry Commission Scotland (2009). The Scottish Government's Policy on Control of Woodland Removal, Edinburgh.
 - The Scottish Government (2019) Scotland's Forestry Strategy 2019-2029. Edinburgh.
 - The Scottish Government (2011). Scottish Land Use Strategy. Edinburgh.

- The Scottish Government (2014a). Scotland's Third National Planning Framework (NPF3). Edinburgh.
- The Scottish Government (2014b). Scottish Planning Policy. Edinburgh.

Policy

14.7 Chapter 5: Renewable Energy and Planning Policy of the EIA Report sets out the planning policy framework that is relevant to the EIA process and the proposed development. The policies set out include those from The Highland Council, Highland-wide Local Development Plan (HwLDP)(2012), relevant aspects of The Scottish Government (2023) Scotland's Fourth National Planning Framework (NPF4), Planning Advice Notes and other relevant guidance.

14.8 Key plans and policies include:

- The Scottish Government (2023) Scotland's Fourth National Planning Framework (NPF4)
- Forestry Commission Scotland (2009) The Scottish Government's Policy on Control of Woodland Removal, Edinburgh.

Guidance

The following guidance has been considered within the assessment Forestry Commission Scotland (2019) Scottish Government's policy on control of woodland removal: implementation guidance;

- Forestry Commission Scotland (2019): Scottish Government's policy on control of woodland removal: implementation guidance February 2019
- Forest Research (2023): The UK Forestry Standard Guidelines. Farnham.
 - Forests and Biodiversity;
 - Forests and Climate Change;
 - Forests and Historic Environment;
 - Forests and Landscape;
 - Forests and People;
 - Forests and Soil; and
 - Forests and Water.
- The Highland Council, Highland Forest and Woodland Strategy (November 2018)
- The Highland Council, Trees, woodlands and development supplementary guidance (January 2013)
- SEPA (2017) SEPA Guidance Notes WST-G-027 Management of Forestry Waste; and
- SEPA (2014) LUPS-GU27 Use of Trees Cleared to Facilitate Development of Afforested Land.
- UKWAS (2012) The UK Woodland Assurance Standard, Third Edition, UKWAS, Edinburgh.

Consultation

- 14.9 As part of the Scoping exercise, a consultation exercise was undertaken to inform the design of the proposed development and to seek agreement on potential significant environmental effects that result from the proposed development as well as the scope of any assessment work required as part of this EIA.
- 14.10 The Scoping Opinion was received from [Local Authority or ECU/ Scottish Ministers] on 20 September 2024.
- 14.11 Consultation relevant to the forestry assessment was undertaken with The Highland Council, Scottish Forestry and Scottish Environment Protection Agency who commented on aspects of methodology, sources of information, scope of assessment and cumulative development. A summary of these consultation responses is provided in Table 14.1.

Table 14.1: Consultation Responses

Consultee	Date Received	Consultation Response	Where and how is this addressed?
The Highland Council (THC)	20 September 2024	A specific chapter on Forestry is required as the layout of the access road, turbines or associated infrastructure will impact on Forestry. The EIAR should provide a baseline survey of the plants including fungi, lichens and bryophytes and trees present on the site to determine the presence of any rare or threatened species. The EIAR should indicate areas of woodland / forestry plantation which may be felled to accommodate new development (including the access), including any off-site works / mitigation. Compensatory planting of new woodland is a clear expectation of any proposals for felling, and thereby such mitigation needs to be considered within any assessment. If trees are removed, then compliance with the Scottish Government's Control of Woodland Removal Policy must be demonstrated.	This forestry chapter addresses the impact on Forestry. The baseline survey of plants including fungi, lichens and bryophytes are dealt with in the Ecology Chapter.
Scottish Forestry	20 September 2024	Woodland removal with a need for compensatory planting - Design approaches that reduce the scale of felling	Design has sought to reduce the impact of felling for the infrastructure with a keyhole approach where possible.

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		required and/or converting the type of woodland to another type (such as from tall conifer plantation to low-height, slow growing woodland), must be considered from the earliest stages, rather than removing the woodland completely. The purpose of any required CP is to secure, through new woodland on site replanting) or off site (on appropriate sites elsewhere), at least the equivalent woodland-related net public benefit embodied in the woodland to be removed.	Compensatory Planting has been addressed with the Applicant committed to provide at least the equivalent woodland-related net public benefit within any new woodland.
		National Planning Framework 4 - Policy 6 Forestry, Woodlands and trees identifies several themes that should be considered relevant to this application – <i>b) Development proposals will not be supported where they will result in:</i> <i>iii. Fragmenting or severing woodland habitats, unless appropriate mitigation measures are identified and implemented in line with the mitigation hierarchy;</i> <i>c) Development proposals involving woodland removal will only be supported where they will achieve significant and clearly defined additional public benefits in accordance with relevant Scottish Government policy on woodland removal. Where woodland is removed, compensatory planting will most likely be expected to be delivered.</i> <i>d) Development proposals on sites which include an area of existing woodland or land identified in the Forestry and Woodland Strategy as being suitable for woodland creation will only be supported where the</i>	As above the design has sought to minimise woodland loss. The proposed development would help to meet the Scottish Government's Policy for Renewable and Low Carbon Energy. As above, the chapter follows the Scottish Government policy on woodland removal.

Consultee	Date Received	Consultation Response	Where and how is this addressed?
		<i>enhancement and improvement of woodlands and the planting of new trees on the site (in accordance with the Forestry and Woodland Strategy) are integrated into the design.</i>	
Scottish Environment Protection Agency (SEPA)	20 September 2024	Forest removal and forest waste 6.1 If forestry is present on the site, the site layout should be designed to avoid large scale felling, as this can result in large amounts of waste material and a peak in release of nutrients which can affect local water quality. 6.2 The submission must include drawings with the boundaries of where felling will take place and a description of what is proposed for this timber in accordance with Use of Trees Cleared to Facilitate Development on Afforested Land – Joint Guidance from SEPA, SNH and FCS.	The design has minimised the felling required for construction. Nutrient release would be controlled through good forestry practice addressed through the Construction Environmental Management Plan (CEMP).

Assessment Methodology and Significance

Scope of Assessment

- 14.12 Forestry planning and operations within the United Kingdom are required to follow the UK Forestry Standards (UKFS).
- 14.13 Scottish Forestry is the Scottish Government agency responsible for forestry policy, support and regulation. They were established as an Executive Agency of the Scottish Government on 1 April 2019, following full devolution of forestry to the Scottish Parliament as a result of the Forestry and Land Management (Scotland) Act 2018 ('the Act'). The Act provides the legal basis for the regulation of forestry in Scotland, and includes the requirement to be in possession of a Felling Permission to fell trees.
- 14.14 The Forestry (Exemptions) (Scotland) Regulations 2019 and The Felling (Scotland) Regulations 2019 include further detailed provisions about the operations of Felling Permission procedures. Included in these exceptions is where the felling is immediately required for the purposes of carrying out development granted by planning permission. This only applies where there is approved planning consent. 'Outline planning',

'preplanning' or 'planning in principle' are not exempt as no formal approval has been given for these.

- 14.15 The Scottish Government's Policy on Control of Woodland Removal (2009) defines woodland removal as the permanent removal of woodland for the conversion to another type of land use. This policy is supported by Scottish Government's policy on control of woodland removal: implementation guidance (2019).
- 14.16 This chapter identifies the potential effects on forestry associated with the impacts of the construction and operation of the proposed development. Where required, it also provides details of additional mitigation measures to address the potential impacts.
- 14.17 The technical scope of the assessment has identified potential impacts and effects of the proposed development on the following likely sensitive forestry receptors during construction and operation:
- Coniferous plantation woodland;
 - Loss of woodland / feature to facilitate the construction of the proposed development; and
 - Permanent loss of woodland associated with the completed development stage of the proposed development.
- 14.18 The assessment also considered the requirement for replanting in situ and/ or for compensatory planting off-site.

Effects Assessed in Full

- 14.19 The following effects were considered to be potentially significant and have been assessed in full within this chapter:
- The total forest cover within the Site and
 - The changes to the forest structure within the Site.

Effects Scoped Out

- 14.20 Secondary effects resulting from forestry activities, including effects on habitats and species, ornithology, hydrology and landscape and visual effects, are considered within their respective chapters of this EIA Report and are not included within this Chapter.

Cumulative Effects

- 14.21 On the basis that the overall forest resource will be maintained across the board in line with CoWRP and UKFS, then no cumulative effects are anticipated.

Study Area

- 14.22 The forestry study area includes all the forest area within the Site is noted in Figure 14.1 Baseline Forestry.

Desk Based Study and Data Sources

- 14.23 The forest study area is part of the Overscaig forest complex. The forest areas as described in the Scottish Forestry Map Viewer as detailed in Table 14.2.

Table 14.2 Forests within the Forestry Study Area

Property Number	Forest name	National Grid Reference	Area (ha)
30000562	Betty's Wood	NC466204	91.60
30000561	Coille A Druim	NC458217	65.8
30000570	Grants Wood	NC464221	55.50
30000571	Fiag A' Tuath	NC461227	56.10
30000569	Coille Linne	NC457232	77.80
30000566	Meall Odhar	NC454239	49.10
30000568	Strath Duchally	NC453245	122.50

- 14.24 Forest data has been provided by the forest owner and agents for an area collectively known as Fiag Siar which includes Grants Wood, Fiag A' Tuath, Coille Linne, Meall Odhar and Strath Duchally. Betty's Wood and Coille A Druim rely on aerial imagery and field survey and National Forest Inventory Open Data.
- 14.25 Ancient Woodland Inventory, Scotland (AWI) and Native Woodland Survey of Scotland Open Data show no ancient or native woodlands within the Site.

Field Survey

- 14.26 A field survey of the Forestry Study Area was undertaken on 8th November 2024. The field survey undertaken acts as ground truthing against the compartment maps supplied. Visual assessment of tree height and vigour was carried out. Example photographic records are provided in Technical Appendix 14.2.
- 14.27 Tree heights recorded are from 8.0m to 17.5m and are summarised by turbine location in Table 14.3.

Table 14.3 Tree Height by Turbine Location

Turbine	Easting	Northing	Tree height (m)
1	244618	925477	13.0
2	245231	925221	14.0
3	244691	924974	13.0
4	245132	924730	14.0
5	244915	924134	17.5
6	245231	923675	16.0
7	245874	923674	11.0
8	245319	923120	13.5

Turbine	Easting	Northing	Tree height (m)
9	246111	923189	8.0
10	245584	922610	10.0
11	246327	922692	14.0
12	245741	922137	16.5
13	246560	922141	13.5
14	245910	921660	16.5
15	246439	921474	13.5

Assessment of Significance

Sensitivity

- 14.28 There is no standard approach to the sensitivity of forestry. However, guidance has been taken from the CoWRP and NPF4 Policy 6.
- 14.29 The sensitivity of receptors has been classified as low, medium or high, in accordance with the criteria set out in Table 14.4.
- 14.30 Scottish Government's policy on control of woodland removal: implementation guidance sets out the following guiding principles of the policy.
- There is a strong presumption in favour of protecting Scotland's woodland resources. The first consideration for all woodland removal decisions should be whether the underlying purpose of the proposals can reasonably be met without resorting to woodland removal.
 - Woodland removal should be allowed only where it would achieve significant and clearly defined additional public benefits. In appropriate cases a proposal for compensatory planting may form part of this balance. The removal of large areas of woodland will not be supported and all felling proposals must be compliant with the UKFS.
 - Approval for woodland removal should be conditional on the undertaking of actions to ensure full delivery of the defined additional public benefits.
 - Planning conditions and agreements are used to mitigate the environmental impacts arising from development and Scottish Forestry (Scottish Government Forestry Regulator) will also encourage their application to development-related woodland removal.
 - Where felling is permitted but woodland removal is not supported, conditions conducive to woodland regeneration should be maintained through adherence to good forestry practice as defined in the UK Forestry Standard.
- 14.31 NPF4, Policy 6: Trees, Woodland and Forestry generally reflects Control of Woodland Removal Policy. This includes the following:
- a) Development proposals that enhance, expand and improve woodland and tree cover will be supported.

b) Development proposals should not be supported where they would result in:

- any loss of ancient woodlands, ancient and veteran trees, or adverse impact on their ecological condition;
- adverse impacts on native woodlands, hedgerows and individual trees of high biodiversity value or identified for protection in the Forestry and Woodland Strategy;
- fragmenting or severing woodland habitats, unless mitigation measures are identified and implemented;
- conflict with Restocking Direction, Remedial Notice or Registered Notice to Comply issued by the Scottish Forestry; and

c) Development proposals involving woodland removal should only be permitted where it would achieve significant and clearly defined additional public benefits. Where woodland is removed in association with development, developers will generally be expected to provide compensatory planting.

Table 14.4: Sensitivity Criteria

Sensitivity	Definition and Examples
Very High	<i>Felling and permanent woodland removal on AWI designations and semi natural woodlands</i>
High	Felling and permanent woodland removal on plantations on ancient woodland sites (PAWS) and NWSS
Medium	Felling and permanent woodland loss of productive conifer plantation or recently planted native woodlands
Low	Unplanted areas within forest land

Magnitude

- 14.32 The criteria for assessing the magnitude of change for the forestry activities associated with the proposed development is the measurement or scale of felling required, both temporary which will be replanted and that which will be permanent woodland loss to forests or woodlands. Permanent woodland loss will be compensated for elsewhere following CoWRP and should also be considered temporary in a Scottish forestry context.

Table 14.5: Magnitude of Effect

Magnitude	Criteria
Major	Large scale woodland removal. Felling without replanting
Moderate	Large scale felling with replanting
Minor	Scale of permanent felling in keeping with scale of forest landscape
Negligible	Scale of temporary felling with replanting in keeping with scale of forest landscape

- 14.33 Felling for the proposed development of 258.71ha is large scale but with replanting is a **Moderate** magnitude of effect.

Significance of Effects

14.34 The criteria for assessing sensitivity follows the CoWRP 2019 Guidance:

- Very High - The removal of large areas of woodland will not be supported
- High - Woodlands with a strong presumption against removal: Annex 2 CoWRP Guidance

14.35 While the initial felling of 258.71ha of woodland is considered high, however the permanent woodland loss of 37.36ha within this woodland would be **Minor**.

Table 14.6: Significance of Effects Matrix

	Sensitivity			
Magnitude	Very High	High	Medium	Low
Major	Major	Major	Major	Major
Moderate	Major	Moderate	Moderate	Moderate
Minor	Moderate	Moderate	Minor	Minor
None	Moderate	Moderate	Minor	Minor

Assumptions and Limitations

14.36 The woodland information is provided by the forest owner and agent for part of the forestry study area only. Other woodland information is based on open data.

Baseline Conditions

14.37 The mixed conifer plantation was mainly planted from 1982 to 1985 with smaller areas planted in 1986 through to 2016. The species are Sitka spruce (*Picea sitchensis*) and Lodgepole pine (*Pinus contorta*) which are predominantly planted in mixture. A small proportion of the area is planted as purely Sitka spruce and purely Lodgepole pine. A very small amount, 1.01ha, of other mixed conifers are planted. There are only small elements of native broadleaved areas with the most present, mainly birch (*Betula spp.*), at the public roadside frontage, 0.58ha.

14.38 Planting year and area for the Fiag Siar woodlands are as Table 14.7

Table 14.7 Fiag Siar Planting Year and Area.

Planting Year	Area (ha)
1982	70.85
1983	68.99
1984	76.07
1985	24.53
1986	4.20
1989	14.12

Planting Year	Area (ha)
1990	17.41
2014	0.56
2016	0.45
<i>Unplanted</i>	159.81
<i>Total</i>	497.78

- 14.39 The other woodlands are of the same species and main 1980's planting years. From NFI and site survey these contain 242.25 ha mixed conifer with 0.58 ha of native broadleaved species.
- 14.40 The total woodland area within the forestry study area is therefore 527.43ha. The summary forest data is provided in the Technical Appendix 14.1: Forest data.
- 14.41 The planted area is overall well stocked (the number of trees per hectare) and with an average Yield Class 14 is not untypical of the location. There are, however, a few areas on the western planted edge that have failed or are low stocking. The areas of Sitka spruce planted as a single species has a clear lower growth performance than where it is planted in mixture with Lodgepole pine.
- 14.42 The plantation is well compartmentalised with forest rides, many of which follow the watercourses flowing west to east into Glen Fiag. There is one existing forest road from near Fiag Bridge and through most of the planted area.
- 14.43 No timber harvesting has taken place to date although expired felling permissions are noted through the Scottish Forestry Map Viewer. No other approved Forest Plans are noted.

Identification and Evaluation of Key Effects

Construction Effects

- 14.44 Areas of woodland will need to be cleared for the construction and operation of the wind farm, including access tracks, turbine locations and other infrastructure which includes battery storage and a substation. However, due to the age and current tree height most infrastructure felling will require felling broader areas to a wind farm boundary in anticipation of windblow. Replanting of these additional "management felling areas" would take place to closer to the infrastructure which would remain as a keyhole. The exception to this would be the compartment surrounding T9 which is one of the poorer performing plantation areas. In this latter case it would be possible to fell to a keyhole design. The felling is summarised in Table 14.8 and Figure 14.2.
- 14.45 Due to the turbine specifications, specifically the clearance from the blade tip to the maximum tree height attained throughout the lifespan of the proposed development, there is no requirement for the further clearance of trees for bat mitigation. This follows the NatureScot guidance, Bats and onshore wind turbines - survey, assessment and mitigation.

- 14.46 An offset of 10 m has been applied to all infrastructure which is included in the permanent woodland loss and excluded from the replanting plan.
- 14.47 A total of 258.71 ha would require felling for the construction of the proposed development. Although these forest crops have not yet attained full maturity they are, for the most part, of a size and quality presentable as forest products. This would release some 95,840 tonnes of forest products which would be available for the Highland Region timber processors or further afield depending on market opportunities at the time.
- 14.48 It is not anticipated that any tree felling would fall into the category of forest waste as described in Use of Trees Cleared to Facilitate Development on Afforested Land – Joint Guidance from SEPA, SNH and FCS.
- 14.49 As stated, replanting of areas felled as management felling would be replanted in situ with mainly mixed conifers but allowing the whole forest to be restructured to the current UK Forestry Standards in terms of species choice and open ground. This would include the temporary compound and amount to a total area 221.35 ha replanting in situ. There would be a permanent loss of 37.36ha arising from the permanent infrastructure and standoff distances required for operational and safety reasons. All replanting and wind farm open ground is shown in Figure 14.3.

Table 14.8 Summary of Felling and Replanting by Area.

Description	Area (ha)
Total felling	258.71
Management felling (to be replanted in situ)	221.35
Permanent woodland loss	37.36

Operational Effects

- 14.50 As part of the proposed development, the area of woodland lost would be replanted off-site in accordance with the implementation guidance to CoWRP. The new woodland would be to at least the area of woodland lost resultant from the proposed development. The new woodland would meet the requirements of UKFS.
- 14.51 The Applicant is committed to providing suitable compensatory planting at a location yet to be determined. The compensatory planting arrangements would be agreed with Scottish Forestry and THC prior to commencement of the construction stage.

Decommissioning Effects

Mitigation Measures and Monitoring

Construction

- 14.52 The proposed development requires clearing of mainly conifer trees for the turbine infrastructure, access and operational and safety stand-off distances.
- 14.53 There are no designated woodlands within the Site.

- 14.54 The scoping opinion from The Highland Council and Scottish Forestry refers to Scottish Government's Control of Woodland Removal Policy and other relevant guidance. This recognises that, where woodland removal is required to enable the proposed development, it is expected to be with minimal woodland removal. The guidance advises that the proposed development falls into the category of woodland removal with a need for compensatory planting.

Compensatory planting is calculated in accordance with Annex 5 of the Scottish Government's Policy on Control of Woodland Removal: Implementation Guidance February 2019. Accordingly, compensatory planting arrangements shall be provided for at least 37.36 ha of woodland.

Table 14.9 Summary of Compensatory Planting

All Woodlands	Permanent tree clearance for construction (ha)	Compensatory planting (ha)
Total	37.36	37.36

- 14.55 Monitoring of forest operations during construction shall be required to ensure compliance with good forestry practice during the removal and planting operations.

Operation

- 14.56 Any forestry activities ongoing during operation of the wind farm, such as planting and maintenance will require no mitigation required for forestry or woodland other than following the UKFS guidelines.
- 14.57 Similarly, the maintenance of the compensatory planting would follow UKFS guidance.

Decommissioning

- 14.58 The above controls will be required should any of the decommissioned Site be replanted.

Cumulative Effects

- 14.59 Since plantation forests and woodlands are typically rotational, a cycle of felling and replanting would occur, as governed through the Forestry and Land Management (Scotland) Act 2018 and/ or the Scottish Government's Policy on Control of Woodland Removal. Therefore, there is no net loss of woodland and as such cumulative effects have not been considered in this assessment.

Residual Effects

Construction

- 14.60 The residual construction effects on forestry are a reduction of planted ground within each forest unit, in total by 37.36ha. However, when considering the proposed mitigation measures, including compensatory planting, the overall magnitude of impact would be negligible and there would be **no likely significant effect**.

Operation

- 14.61 There are no residual adverse operational effects on forestry. As no additional mitigation would be required, the residual completed development effects remain as reported in the assessment of effects section.

Decommissioning

- 14.62 There are no residual adverse decommissioning effects on forestry.

Summary

- 14.63 The total forestry study area extends to 527.43ha of mainly coniferous plantation.
- 14.64 The total felling area for construction including management felling to wind firm boundaries is 258.71ha and a total of 221.35ha of the area felled would be replanted in situ.
- 14.65 As a result of the woodland permanently removed for the turbine infrastructure including tracks and operational and safety stand-off distances, a net woodland loss of 37.36ha would occur. In the absence of mitigation, the effect would be **moderate and not significant**.
- 14.66 In order to comply with the Scottish Government's Control of Woodland Removal Policy, compensation planting would be required to mitigate the loss of woodland area. The Applicant is committed to providing appropriate compensatory planting of 37.36ha. The extent, location and composition of such planting would be agreed with Scottish Forestry.
- 14.67 Following completion of the compensatory planting, the effect of woodland loss is not significant.

Table 14:10 Summary of Potential Significant Effects of the Proposed Development

Likely Significant Effect	Mitigation Proposed	Means of Implementation	Outcome
Construction			
Permanent woodland loss	Compensatory planting will be provided, calculated in accordance with Annex 5 of the Scottish Government's policy on control of woodland removal: implementation guidance February 2019.	Planning Condition requiring scope of compensatory planting to be agreed	Not significant
Increased harvesting with risk to water quality	None required All forestry operations must maintain good practice. The CEMP will incorporate good practice from the 2 nd edition Forestry and Water Scotland guidelines in	Planning Condition requiring scope of CEMP to be agreed	Not significant

Likely Significant Effect	Mitigation Proposed	Means of Implementation	Outcome
	relation to working around watercourses, including connected ditches and drains.		
Operation			
No significant effect	None	N/A	Not significant
Decommissioning			
No significant effect	None	N/A	Not significant
Cumulative Construction			
Not relevant to forestry	None	N/A	Not Relevant/Applicable
Cumulative Operation			
Not relevant to forestry	None	N/A	Not Relevant/Applicable

References

The Scottish Government (2019). Scotland's Forestry Strategy 2019-2029. Edinburgh

The Scottish Government (2016) A Land Use Strategy for Scotland 2016-2021. Edinburgh

The Scottish Government (2023) Fourth National Planning Framework (NPF4). Edinburgh

The Scottish Government (2009) The Scottish Government's Policy on Control of Woodland Removal. Edinburgh

Forest Research (2023) UK Forestry Standard (UKFS). Farnborough

The Scottish Government (2018) Forestry and Land Management (Scotland) Act 2018

SEPA (2014) Use of Trees Cleared to Facilitate Development on Afforested Land. Joint Guidance from SEPA, SNH and FCS

Scottish Natural Heritage (2019) Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation. Joint Guidance

The Highland Council, Highland Forest and Woodland Strategy (November 2018)

The Highland Council, Trees, woodlands and development supplementary guidance (January 2013)

Coille Linne Wind Farm

Environmental Impact Assessment Report Volume 1 Chapter 15: Other Issues

May 2025

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Table 15.1: Consultation Responses

15 OTHER ISSUES

Introduction

- 15.1 This chapter considers potential effects and features which have been scoped out of the full assessment but raise pertinent points for the proposed development or link to other areas of assessment contained within Volume 1.
- 15.2 Specifically, the purpose of this chapter is to summarise the relevant subject matters to provide context to other areas of assessment. Topics addressed within this chapter include summaries of:
- Aviation Lighting, which includes a summary of the approach taken and layout agreed with the Civil Aviation Authority (CAA);
 - Results of the carbon calculator exercise to understand and report on the carbon payback of the proposed development, and;
 - Telecommunications.
- 15.3 The chapter is supported by a number of Technical Appendices (as set out within EIA Report Volume 4: Technical Appendices), comprising:
- Technical Appendix 1.2: Scoping Opinion
 - Technical Appendix 6.8: Night-time Assessment;
 - Technical Appendix 10.4: Carbon Calculator
 - Technical Appendix 15.1: Aviation Lighting Report
- 15.4 Other relevant assessments are set out in Volume 1: Main Text and include:
- Chapter 6: Landscape and Visual;
 - Chapter 8: Ecology; and
 - Chapter 10: Geology, Hydrology and Hydrogeology.

Legislation, Policy and Guidance

- 15.5 Chapter 5 of the EIA Report sets out the planning policy framework that is relevant to the EIA process and the proposed development. The policies set out include those from the Highland-wide Local Development Plan (LDP), the Caithness and Sutherland LDP, relevant aspects of Scottish Planning Policy (SPP) (Scottish Government, 2014), Planning Advice Notes and other relevant guidance.
- 15.6 The principal legislation, policies and guidance relevant to this chapter are listed below. They include relevant local and national planning policy and guidance documents as well as technical guidance relating to the specific issues dealt with herein:
- The Highland-wide Local Development Plan (2012)

- Caithness and Sutherland Local Development Plan (2015)
- The National Planning Framework 4 (2023);
- Scottish Government Onshore Wind: Policy Statement (2017);
- Civil Aviation Publication (CAP) 764 Civil Aviation Authority (CAA) Policy and Guidance on Wind Turbines Version 6 (Feb 2016);
- 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 (dated 01/06/17);
- Air Navigation Order (ANO) Article 222;
- Onshore wind turbines: planning advice (2014); and
- Carbon calculator: technical guidance.

Consultation

- 15.7 As part of the Scoping process, a consultation exercise was undertaken to inform the design of the proposed development and to seek agreement on potential significant environmental effects that result from the proposed development as well as the scope of any assessment work required as part of this EIA.
- 15.8 The Scoping Opinion was received from Scottish Ministers on 20th of September 2024 (see Technical Appendix 1.2).
- 15.9 Consultation relevant to the assessment of 'Other Issues' was undertaken with The Highland Council, Defence Infrastructure Organisation (MoD), Highlands and Islands Airports Limited, Joint Radio Company (JRC), BT and NATS Safeguarding who all commented on aspects of methodology, sources of information, scope of assessment and cumulative development. No responses were received from the Civil Aviation Authority (CAA); therefore, it is assumed they have no comments to make on the scoping report. Aberdeen Airport, Edinburgh Airport, Glasgow Airport and Glasgow Prestwick Airport advised that the development is located outwith their respective safeguarding zones. A summary of consultation responses regarding issues discussed in this chapter is provided in Table 15.1.

Table 15.1: Consultation Responses

Consultee	Response Date	Consultation Response	Where is this addressed?
The Highland Council	13/09/2024	Carbon balance calculations should be undertaken and included within the EIAR with a summary of the results provided focussing on the carbon payback period for the wind farm.	Carbon payback periods are discussed within this Chapter. Carbon balance calculations are presented in EIAR Volume 4, Technical Appendix 10.4.
		The EIAR should recognise TV, radio, telecommunication links, aviation interests including radar, MOD safeguards, etc.	This information is presented within this chapter under Aviation Lighting, and Telecommunications.

Consultee	Response Date	Consultation Response	Where is this addressed?
		THC request that the applicant demonstrate what interests have been identified and the outcomes of any consultations with relevant authorities such as Ofcom, NATS, BAA, CAA, MOD, Highlands and Islands Airports Ltd, etc. through the provision of written evidence of concluded discussions / agreed outcomes.	Further information is presented within the Aviation section. The consultation responses from the specified consultees are presented within this table. Consultation has been carried out with CAA to understand requirements on aviation lighting.
		If there are no predicted effects on communication links as a result of the development, the EIAR should still address this matter by explaining how this conclusion was reached.	This information is presented within this chapter under Telecommunications.
		The EIAR should present a clear summary table of all mitigation measures associated with the development proposal.	A Schedule of Mitigation which presents the mitigation measures relevant to each environmental topic is presented within a dedicated chapter of the EIA Report, including Chapter 15: Other Issues. This includes a description of the measures envisaged to prevent, reducing and where possible offset any significant adverse effects on the environment
Ministry of Defence	23/07/2024	The MoD note the development falls within Tactical Training Area 14 (TTA 14), an area within which fixed wing aircraft may operate as low as 100 feet or 30.5 metres above ground level to conduct low level flight training. the MOD would require that conditions are added to any consent issued requiring that the development is fitted with aviation safety lighting and that sufficient data is submitted to ensure that structures can be accurately charted to allow deconfliction. Additionally, due to the development proposed including WTGs exceeding heights of 150m aal, the proposal is subject to the lighting requirements set	The concerns of the MoD are addressed within this chapter under Aviation.

Consultee	Response Date	Consultation Response	Where is this addressed?
		out in the Air Navigation Order 2016.	
Highlands and Islands Limited (HIAL)	31/07/2024	This proposal is located out-with HIAL safeguarding consultation zone. No comment has been made on the proposal and HIAL have stated they do not need to be consulted further.	Noted – no further action required.
NATS	22/08/2024	The consultee has no safeguarding objection towards the proposed development.	Noted – no further action required.
BT	22/07/2024	The proposed development is unlikely to cause interference to BTs current and presently planned radio network.	Noted – no further action required.
JRC	16/07/2024	The consultee noted that the proposal is cleared, subject to 50m micro-siting, with respect to radio link infrastructure operated by the local energy networks.	The design of this proposal has taken the existing radio link into consideration and has been avoided through design.

Scope of Assessment

Effects Assessed in Full

15.10 The following effects were considered to be potentially significant in relation to “Other Issues” at the scoping stage. The following have been assessed in full within this chapter:

- Aviation Lighting;
- Telecommunications, and;
- Carbon Balance.

Effects Scoped Out

15.11 Effects within topics which have been scoped out include the following:

Air Quality

15.12 No adverse air quality impacts are anticipated from the operation of the proposed development given the rural nature of the site and the distance from sources of air pollution. Additionally, due to the short term, temporary nature of the construction and decommissioning phases, air is scoped out of the EIA Report.

- 15.13 Potential impacts on air quality from dust during the construction and decommissioning phases will be addressed through standard mitigation techniques to be agreed as part of a Construction Environmental Management Plan (CEMP) post-consent. No further specific assessment is proposed.

Ice Throw

- 15.14 During icing conditions there are two types of risks associated with ice collecting on turbines:
- Fragments are thrown off from the operating turbine due to aerodynamic and centrifugal forces; or
 - Ice falls down from the turbine when the blades are stationary.
- 15.15 If there is significant ice build-up on turbine blades, it can be detected by the machines' own sensors and operation curtailed until it melts.
- 15.16 The Scottish Government states the following in its Onshore Wind Farms: Planning Advice (2014) regarding the likelihood of ice build-up posing a risk to the public:

"The build-up of ice on turbine blades is unlikely to present problems on the majority of sites. When icing occurs the turbines' own vibration sensors are likely to detect the imbalance and inhibit the operation of the machines. Site operators also tend to have rigorous, and computer aided maintenance regimes and control rooms can detect icing of blades. Danger to human or animal life from falling parts or ice is rare."

- 15.17 As an added precaution, warning signage may be placed around the site to make the public aware of any risks.

Major Accidents and Disasters

- 15.18 The proposed development is not located in an area with a history of natural disasters (e.g., earthquakes, volcanic activity, and extreme weather events). The likelihood of peat slide risk occurring during the construction phase is not considered to be significant with Technical Appendix 10.3 indicating that there is a low to negligible risk of peat instability across the site.
- 15.19 With regards to mechanical and structural failure in the event of storms or extreme weather events, modern turbines are fitted with sensors which will shut down operations if wind speeds are too high. This is to prevent damage and excessive wear on both blades and internal mechanisms within the turbine.
- 15.20 With regards to wildfires, a full emergency procedure plan would be in place to deal with the emergency. Turbines are fitted with smoke detectors, to allow detection as early as possible. The turbines installed would also be fitted with a fire suppression system, to help limit the spread of any fire. In the event of a fire, the turbine would be fully shut down and isolated from the grid system, the area around the turbine restricted and fire brigade alerted to deal with the incident until such time as the fire was extinguished.

- 15.21 The construction and operation of the proposed development would be managed within the requirements of a number of health and safety related Regulations, including the Construction (Design and Management) Regulations 2015 and the Health and Safety at Work etc. Act 1974.
- 15.22 In conclusion, the development is not considered vulnerable to any major accidents or disasters that could result in likely significant environmental effects.

Shadow Flicker

- 15.23 Shadow flicker is an event where, under certain combinations of geographical position and time of day, the sun may pass behind the rotors of a wind turbine and cast a shadow over neighbouring properties. When the blades rotate, the shadow flicks on and off. It only occurs inside buildings where the flicker appears through a narrow window opening.
- 15.24 The Highland Council Onshore Wind Energy Supplementary Guidance (November 2016) requires wind energy schemes to be designed to avoid causing shadow flicker at regularly occupied buildings not associated with the development.
- 15.25 There is no standard guidance for assessing shadow flicker in Scotland however, as per THC guidance, a shadow flicker assessment is required if any regularly occupied properties not associated with the development lie within 11 x rotor diameter of the wind farm. Northern Ireland Department for Infrastructure - Best Practice Guidance to Planning Policy Statement (PPS) 18 Renewable Energy (2009, updated 2019) recommends that for properties within 500 m of turbines, shadow flicker should not exceed 30 hours per year or 30 minutes per day.
- 15.26 With a tip height of 250m, candidate turbine specifications suggest a likely rotor diameter of 162m. Applying a 11-rotor diameter distance from each turbine gives an allowance of 1782m where effects may occur. The closest inhabited property lies approximately 2.8km from the nearest turbine.
- 15.27 An assessment of the area surrounding the proposed development using GIS mapping software combined with both aerial imagery and Ordnance Survey mapping shows that there are no occupied properties (highlighted pink) within 1782m of any turbine in any direction, outlined in Figure 15.1.
- 15.28 When taking this into consideration, it is unlikely that significant effects would occur, however in the unlikely event of shadow flicker complaints, the Applicant would be willing to commit to a shadow flicker management plan to be agreed with THC post-consent. Mitigation measures could include provision of blinds, curtains or vegetation as deemed appropriate.

Summary of Technical Topics

Aviation Lighting

- 15.29 The Applicant commissioned WPAC to produce an aviation lighting and mitigation report and agree a lighting scheme that meets all requirements of the Civil Aviation Authority (CAA) and Defence Infrastructure Organisation (DIO).
- 15.30 In correspondence dated 20th November 2024, the CAA agreed to the proposed Aviation Lighting Scheme, the design of which is summarised below and detailed in full in Technical Appendix 15.1.
- 15.31 The site proposed site is located in MOD Low Flying Area (LFA) 14 which includes Tactical Training Area (TTA) 14 by day and the Highland Restricted Area (HRA) by NOTAM. This is the busiest LFA and converts to Night Allocated Region (NAR) 1BE during the hours of darkness. Although primarily a fast jet training area, the airspace is also used by NATO tactical aircraft and helicopters day and night. Military fast jet aircraft operate down to 100ft (30m) and military transport aircraft down to 150ft (46m) above ground level. Helicopters routinely operate down to 30ft (9m) and on occasion ground level.
- 15.32 To fulfil all CAA and MoD requirements, all 15 turbines will be fitted with Infra-Red (IR) Lights (at hub height), and 6 dominant, by position, turbines fitted with medium intensity ANO 2000/200cd Visible Red Lights to the nacelles. MOD IR lights have been developed to be invisible to the public at large but very detectable to aircrew night vision aids.
- 15.33 The proposed development is located under unregulated airspace, which is designated Class G by the CAA and away from any civil or military airfields.
- 15.34 A total of six out of 15 of the proposed turbines will be fitted with visible aviation lights to fulfil the CAA's requirements, which state that all perimeter turbines must be lit unless removing a light leaves a gap of less than 900m between remaining lit turbines. These requirements have allowed for the removal of lights from nine perimeter turbines while maintaining a gap of less than 900m between remaining lit turbines.
- 15.35 The visible aviation lights have a maximum brightness of 2000 candela (cd) when viewed on a horizontal plane. This figure is reduced significantly as the viewing angle changes. For example, the brightness is reduced by 50% to 1000cd when viewed from 1 degree below the horizontal (as outlined in Technical Appendix 15.1 within ElAR Volume 4).
- 15.36 Distance from aviation lights also reduces their perceived brightness, a phenomenon known as attenuation. Measurements indicate that attenuation is typically in the order of 10 to 20% but can be as much as 75% depending on atmospheric conditions.
- 15.37 Visible aviation lights are only operated at their maximum brightness when visibility is less than 5km in all directions, such as during thick mist or heavy rain. In all other conditions, which account for approximately 95% of the time, visible aviation lights are operated at 200cd, or 10% of their maximum brightness. Assessing Met Office records from Inverness Airport suggests that maximum brightness is only required for approximately 5% of the time.

Telecommunications

- 15.38 Telecommunication links across the Site were investigated as part of initial constraint investigations. A telecommunications tower, owned by Airwave Solutions Limited, is located within the site boundary and a 200m buffer was applied.
- 15.39 The Office of Communications (Ofcom) is responsible for the licensing of two-way radio transmitters. It holds a register of most microwave links and will therefore be consulted in order to establish baseline conditions.
- 15.40 However, as not all microwave links are published, system operators will also be individually consulted on the proposed development's potential to cause electromagnetic interference.
- 15.41 Given the distance between the links and the turbine envelope, it is considered that the turbines are located suitably out with the telecoms links and therefore will not result in any effects upon these assets.
- 15.42 Furthermore, no consultees have raised concerns regarding telecommunication links, as further detailed in the Scoping Opinion (see EIA Report Volume 4, Technical Appendix 1.2), therefore issues relating to telecommunications have not been considered further within this assessment.

Carbon Balance

- 15.43 The results described in the following section use the Scottish Government's Carbon Calculator⁽¹⁾ for wind farms on peat to estimate the benefit of displacing conventionally generated electricity in the grid relative to the predicted direct and indirect emissions of carbon resulting from the construction and operation of the proposed development. This includes losses of stored carbon from felled forestry and affected peatland. The Carbon Calculator also provides an estimate of the carbon payback time for the proposed development.
- 15.44 The Scottish Government's Carbon Calculator was designed in response to concerns on the reliability of methods used to calculate reductions in greenhouse gas emissions from large scale wind farm developments on peat land. The methodology used considers the wider potential impacts on peat land hydrology and the decomposition of organic matter. The baseline assessment of carbon stored in soils at the proposed development has been calculated using site-based data and standard conversion factors.
- 15.45 The results of the Carbon Calculator for the proposed development show that it is estimated to produce annual carbon savings in the region of 80,133 tonnes of CO₂e per year, and lifetime savings of 2,804,655 t of CO₂e. These savings come about through the displacement of grid electricity, based on the current average grid mix.
- 15.46 The assessment of the carbon losses and gains has estimated an overall loss of 257,168 tonnes of CO₂e, mainly due to embodied losses from the manufacture of the turbines and provision of backup power to the grid, which should be reduced through the provision of on-site energy storage.

- 15.47 The estimated payback time (against grid mix) of the proposed development, using the Scottish Government's Carbon Calculator, is estimated at 3.2 years, with a minimum/maximum range of 2.4 to 4 years.

Cumulative Effects

- 15.48 There is no potential for significant cumulative impacts in relation to aviation and telecommunications when considered alongside other proposed developments in the local area. There is, however, consideration of cumulative visual effects arising from the requirement for aviation lighting which is addressed further in EIA Report Chapter 6: Landscape and Visual.

Residual Effects

- 15.49 Following implementation of mitigation through design and best practice as well as the mitigation measures identified above, it is considered that there would be no significant effects on aviation, telecommunications and climate change.

Summary

- 15.50 The topics of Aviation Lighting, Telecommunications and Carbon Balance and have been discussed in this chapter along with associated mitigation where required. This chapter has therefore provided a summary of results, relevant information, and viable solutions agreed with consultees where necessary.

References

The Scottish Government. Carbon calculator: technical guidance. Gov.scot. Published 2018. Accessed December 22, 2021. <https://www.gov.scot/publications/carbon-calculator-technical-guidance/>

The Scottish Government. Onshore wind turbines: planning advice. Gov.scot. Published May 28, 2014. Accessed December 21, 2021. <https://www.gov.scot/publications/onshore-wind-turbines-planning-advice/>

Ofcom, Tall structures and their impact on broadcast and other wireless services, August 2009

The Scottish Government (2023) Fourth National Planning Framework (NPF4).
Edinburgh

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Environmental Impact Assessment Report Volume 1 Chapter 16: Schedule of Mitigation

June 2025

16 SCHEDULE OF MITIGATION

Introduction

- 16.1 This chapter sets out a Schedule of Mitigation relevant to the proposed development, including all embedded and additional mitigation set out within Chapter 6: Landscape and Visual to Chapter 15: Other Issues.
- 16.2 This chapter therefore acts as a succinct guide as to the mitigation which would be required in order to avoid or reduce likely significant environmental effects so that they would be acceptable. It may act as a basis upon which detailed post-consent mitigation is based upon and would be a founding basis upon which to produce a detailed and comprehensive Construction Environmental Management Plan (CEMP) to be produced and agreed prior to construction.
- 16.3 It also includes monitoring measures to understand future baseline and effects of the proposed development, where relevant and applicable.
- 16.4 Mitigation from each chapter is summarised in the tables overleaf. These tables set out the nature of the mitigation measure, and whether it is required pre-construction, during construction, or relates to post-construction monitoring. Justification for each of the mitigation measures is contained within the relevant section of the EIA Report.

Table 16.1: Schedule of Mitigation

Subject	Detail of mitigation or monitoring commitment	Stage of Mitigation
Chapter 6: Landscape and Visual		
Mitigation Through Design	Where possible, visual screening has been prioritised, along with efforts to avoid overlapping or 'stacked' turbines, isolated outliers, and to develop a layout that harmonises with existing and proposed wind turbines through considered design and placement.	Design
	Turbines themselves would be painted an off-white colour with a low reflectivity semi-matt finish (or similar as agreed with consultees). Such a finish is widely regarded to be the least intrusive in the landscape when seen against the sky in a host of weather conditions typically experienced within the UK.	Design
	The proposed development has adopted a cardinal lighting design where only six of the outermost turbines are lit (T1, T4, T6, T9, T12, and T15).	Design
Forestry	The forestry replanting design (see EIAR Volume 2 Figure 14.3) has been developed in-part to maximise the screening/ filtering benefits of the forestry across the lifetime of the proposed development.	Design
Night-Time Visual Effects	Mitigation of nighttime visual effects from Aviation Lighting is set out in EIAR Volume 4, Technical Appendix 15.1, and is summarised in Section 15: Other Issues below.	Operation
	Visibility sensors to be installed on relevant turbines to measure the prevailing atmospheric conditions and visibility range. Should atmospheric conditions mean that visibility from the turbines within the Site is greater than 5km from the proposed development, CAA policy permits lights to operate in a lower intensity mode, being a minimum of 10% of their capable illumination.	During Construction and Operation
Development Decommissioning	When the proposed development is decommissioned, the turbines would be removed from the Site, and the hardstanding would be restored in accordance with a restoration plan to be approved by the relevant consultees.	Decommission
Chapter 7: Cultural Heritage		
Fieldwalking Investigations	It is proposed that a programme of fieldwalking take place on the area of the proposed turbines, crane pads and access tracks to identify any archaeological assets which may be present within the areas and may be impacted by the proposed scheme. Should archaeological remains be identified, consultation will be undertaken with Highland Council's Archaeologist, to assess whether archaeological investigation would yield results which could provide information to the archaeological record. If archaeological investigation was warranted, the scope of such works would be agreed with Highland Council prior to commencement.	Pre-construction

Subject	Detail of mitigation or monitoring commitment	Stage of Mitigation
Chapter 8: Ecology		
Good Practice Mitigation Measures	Generic mitigation measures that would apply during construction and operational phases are outlined below. The following measures represent general best practice and would reduce potential effects on a number of receptors: • Not more than 16 weeks prior to construction of the Proposed Development and within the correct survey season, the Applicant will engage a Suitably Qualified Ecologist (SQE) to undertake a series of repeat ecological surveys to update the baseline data. • The aim of the repeat ecological surveys will be to provide up to date information in order to confirm required mitigation, including the need for protected species licensing and species protection plans for the site. The result of the pre-construction surveys will be communicated to the Contractor by the SQE and will be fed into the CEMP. The recommendations will ensure compliance with the necessary wildlife legislation. • Adherence to SEPA Guidance Pollution Prevention (GPP) in respect to working in and around watercourses. • Adherence to NatureScot (formally SNH) guidance on upland track construction. • All vehicles will be restricted to 5 mph while within 100m of watercourses. • Avoidance of unnecessary disturbance to habitats by minimising the extent of vegetation clearance and other construction practices. • Restriction of plant and personnel to a prescribed working corridor through the use of temporary barriers or fences, minimising damage to habitats and potential direct mortality and disturbance to species. • Adherence to best practice guidance with respect to culvert and bridge design. • Any trenches dug during construction and decommissioning operations will be covered at the end of each day to prevent mammals becoming trapped. Alternatively, mammal ramps will be positioned in such a way that trapped mammals may be allowed to escape. • All exposed pipes and trenches will be checked each morning prior to starting construction activities. If trapped animals are found, the SQE will be contacted. • Ecological toolbox talks will be provided to all new site staff on the potential presence of protected species and any measures that need to be undertaken.	Pre-construction, during construction and postconstruction
Ecological Toolbox Talks	Ecological toolbox talks will be provided to all new site staff on the potential presence of protected species and any measures that need to be undertaken.	Pre-Construction

Subject	Detail of mitigation or monitoring commitment	Stage of Mitigation
OHMP & OPMP	An Outline Habitat Management Plan (OHMP) (EIAR Volume 4, Technical Appendix 8.3) and an Outline Peat Management Plan (OPMP) (EIAR Volume 4, Technical Appendix 10.3) details the proposed mitigation and enhancement measures designed to reduce negative impacts. In summary, these proposals include: - Monitoring of deer numbers to inform the requirement for any reduction of grazing through deer management. - Peatland restoration of suitable areas involving hag re-profiling (62Ha of potentially suitable areas are shown in Figure 8.4). - Translocate any surplus excavated peat within the Developable Area. - Not re-stocking sections of commercial forest plantation that are proposed to be felled	During Construction, Decommission
Bats	A minimum of 50m buffer distance will be applied from the turbines to the edge of the woodland including those woodland edges created from felling.	During Construction, Decommission
	Should any suitable features for roosting bats or bat roosts be identified within 30 m of any working areas or 200m of turbine locations, during the preconstruction surveys or during construction, all works will cease until the ECoW is contacted for advice. It may be necessary to obtain a licence from NatureScot.	During Construction, Decommission
	All site lighting (if required) will be directed to the area required and light spill minimised. No lighting of woodland edges or tree/structures with suitable features should be undertaken.	During Construction, Decommission
Operational Mitigation	Monitoring of the proposed mitigation and enhancement activities outlined above will be carried out to measure effectiveness during the lifespan of the windfarm (35 years).	During Construction, Operation
Chapter 9: Ornithology		
Good Practice Mitigation Measures	Generic mitigation measures that would apply during construction and operational phases are outlined below. The following measures represent general best practice and would reduce potential effects on a number of receptors: - Not more than 16 weeks prior to construction of the Proposed Development and within the correct survey season, the Applicant will engage a Suitably Qualified Ecologist (SQE) to undertake a series of repeat ecological surveys to update the baseline data. - The aim of the repeat ecological surveys will be to provide up to date information in order to confirm required mitigation, including the need for protected species licensing and species protection plans for the site. The result of the pre-construction surveys will be communicated to the Contractor by the SQE and will be fed into the CEMP. The recommendations will ensure compliance with the necessary wildlife legislation.	Pre-construction, during construction and post-construction

Subject	Detail of mitigation or monitoring commitment	Stage of Mitigation
	• Adherence to SEPA Guidance Pollution Prevention (GPP) in respect to working in and around watercourses. • Adherence to NatureScot (formally SNH) guidance on upland track construction. • All vehicles will be restricted to 5 mph while within 100m of watercourses. • Avoidance of unnecessary disturbance to habitats by minimising the extent of vegetation clearance and other construction practices. • Restriction of plant and personnel to a prescribed working corridor through the use of temporary barriers or fences, minimising damage to habitats and potential direct mortality and disturbance to species. • Adherence to best practice guidance with respect to culvert and bridge design. • Any trenches dug during construction and decommissioning operations will be covered at the end of each day to prevent mammals becoming trapped. Alternatively, mammal ramps will be positioned in such a way that trapped mammals may be allowed to escape. • All exposed pipes and trenches will be checked each morning prior to starting construction activities. If trapped animals are found, the SQE will be contacted. • Ecological toolbox talks will be provided to all new site staff on the potential presence of protected species and any measures that need to be undertaken.	
Outline Habitat Management Plan	An Outline Habitat Management Plan (OHMP) for the site is included in Volume 4: Technical Appendix 9.3, and sets out mitigation measures for peatland, woodland habitats, fish fauna and protected species.	Pre-Construction
Wildlife and Countryside Act 1981	The main legislation which embedded mitigation needs to comply with is the Wildlife and Countryside Act 1981 (as amended). Under this legislation, it is an offence to kill or injure any bird, or to damage or destroy nests and eggs. Breeding species listed on Schedule 1 of the Act are afforded extra protection from disturbance while breeding	During Construction, Operation, Decommission
Timing of Works	Forest felling works will be undertaken outside the April to July breeding season of the qualifying species recorded on adjacent open habitats during baseline surveys. This is a firmer commitment, because the works are more straightforward, with a less restricted supply chain.	During Construction, Decommission
	The foundation excavations and erection of turbine numbers 1, 3, 5, 8, 10 and 12 will be scheduled, if possible, outside the April to July breeding season for the same reason. If that whole period cannot be avoided, an effort will be made to avoid April and May, when sensitivity by nesting birds to disturbance is greatest.	During Construction, Decommission
Pre-Felling Checks	Pre-felling checks will be carried out by a suitably qualified and experienced ornithologist so that active bird nests are avoided and cordoned off to prevent damage or disturbance.	Pre-construction, Decommission

Subject	Detail of mitigation or monitoring commitment	Stage of Mitigation
Survey for Breeding	A pre-construction breeding bird survey of open habitat outside the conifer plantation and within 1km of works will be completed ahead of any operations, by a suitably experienced and qualified ornithologist, consisting of a four visit Brown and Shepherd (1989) moorland breeding bird survey and a breeding raptor survey. All records will be digitised and mapped, and putative territories marked on, and made available to the ECoW (see below). Prior to construction (including any site investigation works carried out during the bird breeding season), a Breeding Bird Protection Plan will be submitted for approval by NatureScot and The Highland Council setting out all detailed measures to ensure nesting birds will be fully protected and wildlife legislation will be complied with. The Breeding Bird Protection Plan will include such details as the exclusion distances from nests, stipulations that no works will be permitted within the exclusion zone and no personnel or vehicles will be allowed to enter or pass through until the ECoW has confirmed that the chicks have fledged, or the breeding attempt has failed.	Pre-construction, Decommission
Ecological Clerk of Works	To ensure implementation and compliance of the Breeding Bird Protection Plan throughout the construction period, a suitably qualified and experienced ECoW, approved by NatureScot and The Highland Council, will be appointed by the applicant to be on site full-time. They will issue weekly reports of implementation and compliance with the Breeding Bird Protection Plan to NatureScot, The Highland Council and RSPB. As part of their duties, the ECoW will deliver 'toolbox talks' to all site forestry and construction staff to ensure that all contractors working on the proposed development are aware of ornithological sensitivities and relevant legislation.	During Construction, Decommission
Significant Operational Works in Breeding Season	Routine maintenance required during operation is expected to be minimal, limited to small areas and of temporary duration. However, should significant operational works be required during the nesting bird season, or any Schedule 1 nesting birds be observed during the operational phase, it is recommended that the mitigation measures outlined above for the construction phase are implemented to protect breeding birds and ensure compliance with the relevant legislation.	Operation
Chapter 10: Geology, Hydrology and Peat		
Buffers	A 50m buffer has been maintained around all surface watercourses, except where watercourse crossings are required.	Design
	Application of appropriate buffers (250m) around identified GWDTE	Design
Peatland	Avoiding the placement of turbines in peat greater than 1m in depth	Design
	Avoidance of high-quality peatland as identified within the NVC and Peatland Condition Assessment.	Design
	No infrastructure is proposed to be constructed in or near areas of medium or high peat landslide risk.	Design
Floating Tracks	It is proposed that floated access tracks will be placed where peat exceeds 1m in depth.	Design

Subject	Detail of mitigation or monitoring commitment	Stage of Mitigation
Construction Environmental Management Plan	Rigorous construction environmental management procedures will be implemented in line with a Construction Environmental Management Plan (CEMP) (see below) to ensure appropriate protection of the above-noted watercourses, and all other surface water receptors.	Pre-Construction
Water Quality	The appointed Contractor will undertake pre-construction baseline water quality sampling and analysis of the principal surface water receptors River Fiag, Strath Duchally Burn and Loch Shin and selected monitoring points within the adjacent Caithness and Sutherland Peatlands Ramsar site. The Contractor will implement a programme of monthly monitoring and analysis of the water quality of these watercourses / features during the construction period to ensure that they are not being impacted by the construction works. The full scope of monitoring will be detailed within the CEMP.	Pre-Construction, During Construction, Decommissioning
Pre-Construction Site Investigations	To determine ground and groundwater conditions across the site, pre-construction site investigations will be conducted. These investigations will focus on areas where construction is proposed to be undertaken and will allow the turbines and the associated infrastructure to be micro-sited away from any areas considered to be unsuitable, such as areas of contamination (unlikely), areas of deeper peat wherever possible, or where there are significant groundwater flows.	Pre-construction
	Investigations will also include targeted monitoring and assessment of the groundwater levels and flows beneath the site. This will allow for micro-siting and to assist in the detailed design of infrastructure and selection of appropriate materials for use during the construction process. Investigations within the borrow pit search areas will allow appropriate selection of specific extraction areas, to avoid or minimise any adverse effects associated with quarrying activities.	Pre-construction
	No excavation will occur until site investigations have been undertaken to assess the suitability of the areas and refine the assessment of peat slide risk. For example, areas of deeper peat, if found to be present within the search areas would be avoided, thereby reducing the peat slide risk. If it is determined that no suitable excavation site within any given search area can be identified, then no excavation will occur at that search area.	Pre-Construction
Peat Management	Any peat excavated will be re-used on site as set out in the Outline Peat Management Plan (EIAR Volume 4, Technical Appendix 10.2).	During Construction, Decommissioning
Pollution Impact	All earthmoving works or similar operations will be carried out in accordance with BSI Code of Practice for Earth Works BS6031:1981.	During Construction, Decommissioning
	All watercourse crossings and site discharges will be regulated under the CAR licensing regime and all necessary licences will be sought from SEPA prior to the commencement of any operations on site.	Pre-Construction, During Construction, Decommissioning

Subject	Detail of mitigation or monitoring commitment	Stage of Mitigation
	While it is acknowledged that best practice to minimise run-off would be to undertake construction and dismantling during the driest period of the year, given the location of the proposed development site, there are likely to be significant periods of rainfall throughout the year. Therefore, site management will check the local weather forecast daily and prime all site staff to ensure that everyone is aware of their responsibilities to maintain the pollution control system during wet weather or suspend sensitive operations during adverse weather conditions.	Pre-Construction, During Construction, Decommissioning
	All fuel and other chemicals will be stored in accordance with best practice procedures, including being kept within a designated fuelling site located at a safe distance from existing watercourses and in appropriate impermeable bunded containers/areas, which will be defined within the outline CEMP. These will be designed to capture any leakage, whether from a tank or from associated equipment such as filling and off-take points, sighting gauges etc., all of which will be located within the bunded area.	During Construction, Decommissioning
	Oil booms and soakage pads will be maintained in all work areas and spill kits kept in all vehicles to enable a rapid and effective response to any accidental spillage or discharge. All construction staff will be trained in the effective use of this equipment.	Pre Construction, During Construction, Decommissioning
	Construction vehicles and plant will be regularly maintained and all maintenance, fuelling and vehicle washing will be undertaken on appropriate impermeable surfaces away from watercourses to minimise risks of leaks to soil and surface waters.	During Construction, Decommissioning
	Concrete batching will be undertaken in a designated area within a temporary construction compound. The Contractor will develop a method statement to address the on-site batching of concrete and the transport, transfer, handling and pouring of liquid concrete at foundations. It is likely that water will require to be abstracted to facilitate any on-site batching processes. A separate CAR licence application for any water abstractions required will be made to SEPA at the appropriate point prior to the commencement of construction.	Pre-Construction, During Construction, Decommissioning
	Cement, grout and unset concrete will not be allowed to enter the water environment. No operations involving concrete transfer between vehicles or into vehicles will take place within 30m of watercourses and water bodies.	During Construction, Decommissioning
	Any vehicles used for delivery of concrete will only be washed out at locations to be agreed with SEPA. Excess concrete or wash-out liquid will not be discharged to drains or watercourses on site or at compounds. Drainage from washout facilities will be collected and treated or removed to an appropriate treatment point / licensed disposal site.	During Construction, Decommissioning
Integrity of Banking	construction staff will be instructed to maintain a sufficient distance from the watercourses located on site to ensure there is no incursion towards them.	During Construction, Decommissioning

Subject	Detail of mitigation or monitoring commitment	Stage of Mitigation
	Water crossing designs will follow best practice to prevent impact on the integrity of the banking of watercourses. Detailed design will be included within a Construction Method Statement to be agreed with The Highland Council and SEPA and detailed watercourse crossing designs will be regulated under the CAR licensing regime.	Design, Pre-Construction, Decommissioning
Direct Discharge of Untreated Foul Drainage	Welfare facilities will either connect directly to self-contained storage tanks or to a septic tank, subject to approval from SEPA.	During Construction, Decommissioning
	If self-contained or septic tanks are to be used, these will be maintained and emptied on a regular basis by a suitably licensed contractor.	During Construction, Decommissioning
Surface Water Drainage	A detailed Drainage Strategy (DS) will be developed and agreed with SEPA and The Highland Council. The DS will detail the site drainage design, including the type of surface to be used for new access tracks, the soft engineering and habitat enhancement measures proposed to slow surface water flows and any necessary ponds, swales, cross drains, and bunds, to ensure that run-off from hard surfaces will be controlled. The DS will also detail the dimensions and final design of proposed watercourse crossings which will be designed to maintain continuous flows.	Pre-construction, Operation
Fluvial Geomorphology	The detailed design for the watercourse crossings, and the requirements for CAR authorisations or licenses, will be agreed with in order to ensure that any potential impacts are minimised.	Pre-construction, Operation
Chapter 11: Noise		
Construction times	Construction activities will be scheduled, unless otherwise agreed, from Monday to Friday 07:00 to 19:00 and Saturday 07:00 to 13:00. Unattended plant equipment should be kept to a minimum. Construction activities outside of these times, short term high transient noise events, or activities relatively close to noise sensitive receptors (NSRs) should be scheduled in consultation with the residents to minimise their inconvenience	During construction
Construction Noise Management Plan	As part of a Construction Environmental Management Plan (CEMP) a Construction Noise Management Plan (CEMP) would be produced. The plan would be taken forward for all construction works and any post-construction works of a similar nature that are associated with the proposed development (e.g. maintenance). The plan would include a clear construction schedule detailing the equipment to be used and the following information: 1. Detailed plan showing how permitted working hours will be adhered to; 2. Selection of quiet equipment and possibly acoustic barriers near noisy sources to ensure construction noise limits are met 3. A detailed plan on community relations including a Stakeholder Engagement Plan (SEP) including the setting up of a complaint phone line, a procedure to notify residents and the EHO of any necessary work outside of the permitted working hours and an approach to the investigation of complaints.	Pre-construction and post-construction

Subject	Detail of mitigation or monitoring commitment	Stage of Mitigation
Operation	The assessment of operational immission from the Proposed Development assumed that the turbines would operate in their standard mode of operation using rotor blades fitted with trailing edge serration. The results demonstrated that immission from the proposed turbines would be able to meet a simplified 35dB(A) ETSU-R-97 noise limit at all receptors by a comfortable margin. Therefore, operational noise assessments considering the Proposed Development in isolation demonstrate that no mitigation is required.	N/A
Chapter 12: Traffic and Transport		
Abnormal Indivisible Loads Route	Agree AIL route modifications and improvements with THC, TS and other relevant stakeholders. Works which will be required to facilitate turbine deliveries are outlined in the RSR, which is presented in Technical Appendix 12.1	Pre-Construction, During Construction, Decommissioning
HGV Numbers	Where possible, the detailed design process will minimise the volume of material to be imported to site to help reduce HGV numbers.	Pre-Construction, During Construction, Decommissioning
Staff Travel Plan	A Staff Travel Plan will be deployed where necessary, to manage the arrival and departure profile of staff and to encourage sustainable modes of transport, especially car-sharing. A package of measures could include: • appointment of a Travel Plan Coordinator (TPC); • provision of public transport information; • mini-bus service for transport of site staff; • promotion of a car sharing scheme; and • car parking management	Pre-Construction, During Construction, Decommissioning
Transport Management Plan	A review of A838 passing places would be undertaken post consent with THC transport officers to agree a list of strategic passing place enhancements, if deemed necessary. The review will consider passing places that would be extended and widened (within the limits of the adopted road boundary). This review will help improve journey times on the A838 in the single carriageway section and reduce potential conflicts with other road users.	Pre-Construction, During Construction, Decommissioning
	Upon agreement of the passing place improvements, the passing places would be upgraded prior to the start of bulk deliveries being made to site.	During Construction, Decommissioning
Dust and Spillage of Transported Materials	All materials delivery lorries (dry materials) should be sheeted to reduce dust and stop spillage on public roads.	During Construction, Decommissioning

Subject	Detail of mitigation or monitoring commitment	Stage of Mitigation
Training and Standards for Material Transport	Specific training and disciplinary measures should be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway.	Pre-Construction, During Construction, Decommissioning
Wheel Cleaning	Wheel cleaning facilities may be established at the site entrance, depending on the views of THC.	During Construction, Decommissioning
Site Working Hours	Normal site working hours will be limited to between 0700 and 1900 Monday to Friday and 0700 and 1300 on Saturdays though component delivery and turbine erection may take place outside these hours i.e. depending on when police escort is available.	During Construction, Decommissioning
Traffic Management Measures	Appropriate traffic management measures will be put in place on the A838 leading through to the Site, to avoid conflict with general traffic, subject to the agreement of THC. Typical measures will include HGV turning and crossing signs and / or banksmen at the site access and warning signs.	During Construction, Decommissioning
Notification to Residents	Provide construction updates on the project website, social media feeds and a newsletter to be distributed to residents within an agreed distance of the site.	Pre-Construction, During Construction, Decommissioning
Speed Limits	Adoption of voluntary reduced speed limits, for example on the A838 in the vicinity of the site access junction and at other locations to be agreed with THC.	During Construction, Decommissioning
Driving Health and Safety Induction	All drivers will be required to attend an induction to include: • A toolbox talk safety briefing; • The need for appropriate care and speed control; • Highlighting the presence of pedestrian and cyclists on the Study Area, in particular on the A836; • A briefing on driver speed reduction agreements (to slow site traffic at sensitive locations through the villages); and • Identification of the required access routes and the controls to ensure no departure	Pre-Construction
Baseline road condition	Video footage of the pre-construction phase condition of the abnormal loads access route and the construction vehicles route would be recorded to provide a baseline of the state of the road prior to any construction work commencing. This baseline would inform any change in the road condition during the construction stage of the proposed development. Any necessary repairs would be coordinated with The Highland Council. Any damage caused by traffic associated with the proposed development, during the construction period that would be hazardous to public traffic, would be repaired immediately.	Pre-construction, During Construction, Decommissioning

Subject	Detail of mitigation or monitoring commitment	Stage of Mitigation
Road condition during construction	There would be a regular road edge review and any debris and mud would be removed from the public carriageway to keep the road clean and safe during the initial months of construction activity, until the construction junction and immediate access track works are complete.	During construction, Decommissioning
Street Furniture	Any damage to road infrastructure caused directly by construction traffic would be made good, and street furniture that is removed on a temporary basis would be fully reinstated.	During Construction, Decommissioning
Abnormal Indivisible Loads	Before the AILs traverse the routes from the PoE, the following tasks would be undertaken to ensure load and road user safety: • Ensure any vegetation which may foul the loads is trimmed back to allow passage; • Confirm there are no roadworks or closures that could affect the passage of the loads; • Check no new or diverted underground services on the proposed route are at risk from the abnormal loads; and • Confirm the police are satisfied with the proposed movement strategy.	Pre-construction
	The AIL Route Survey Report / Abnormal Load Assessments highlight a number of constraint points which have been assessed within the report using swept path assessment software for both an 81.5m blade and the most onerous tower sections. The locations of the constraint points and the swept path drawings are included in the AIL RSRs provided in Technical Appendix 12.1. The RSR provided in Technical Appendix 12.1 identify key points and issues associated with the route that require street furniture removal and temporary paving to accommodate the predicted loads. AIL mitigation works will be designed to be temporary in nature to enable restoration to their original condition (if required by THC	Pre-construction
	An AIL Transport Management Plan will be developed. All AIL deliveries would be undertaken at appropriate times (to be discussed and agreed with the relevant roads authorities and police) with the aim of minimising the effects on the local road network. It is likely that the abnormal load convoys would travel in mid-morning to avoid school drop off and pick up times	Pre-construction, During Construction, Decommissioning.
	Advance warning signs would be installed on the approaches to the affected road network. This signage will assist in helping improve driver information and allow other road users to consider alternative routes or times for their journey (where such options exist). The location and numbers of signs would be agreed post consent and would form part of the wider Traffic Management Proposal for the project.	Pre-construction, During construction, Decommissioning
	The Abnormal Load Transport Management Plan would also include: • Procedures for liaising with the emergency services to ensure that police, fire and ambulance vehicles are not impeded by the loads. This is normally undertaken by	Pre-construction, During Construction, Decommissioning

Subject	Detail of mitigation or monitoring commitment	Stage of Mitigation
	informing the emergency services of delivery times and dates and agreeing communication protocols and lay over areas to allow overtaking; • A diary of proposed delivery movements to liaise with the communities to avoid key dates; • A protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic; and • Proposals to establish a construction liaison committee to ensure the smooth management of the project / public interface with the applicant, the construction contractors, the local community, and if appropriate, the police forming the committee. This committee would form a means of communicating and updating on forthcoming activities and dealing with any potential issues arising.	
Outdoor Access Management Plan	Consideration has been given to pedestrians, cyclists and equestrians alike due to potential interactions between construction traffic and users of forest tracks and public roads. If required, a Path Planning Study will be conducted post consent and will be secured through a planning condition. Findings from the study will be used to formulate a set of measures into an Outdoor Access Management Plan (OAMP)	During construction, Decommission
	Signage will be installed on the site exits that makes drivers aware of local speed limits and reminding drivers of the potential presence of pedestrians, cyclists and equestrians in the area. This will also be emphasised in the weekly toolbox talks.	During Construction, Decommission
	The British Horse Society has previously recommended the following actions that will be included in the site training for all HGV staff: • On seeing riders approaching, drivers must slow down and stop, minimising the sound of air brakes, if possible; • If the horse still shows signs of nervousness while approaching the vehicle, the engine should be shut down (if it is safe to do so); • The vehicle should not move off until the riders are well clear of the back of the HGV; • If drivers are wishing to overtake riders, please approach slowly or even stop in order to give riders time to find a gateway or lay by where they can take refuge and	During Construction, Decommission

Subject	Detail of mitigation or monitoring commitment	Stage of Mitigation
	create sufficient space between the horse and the vehicle. Because of the position of their eyes, horses are very aware of things coming up behind them; and All drivers delivering to the site must be patient. Riders will be doing their best to reassure their horses while often feeling a high degree of anxiety themselves	
Operational Phase Mitigation	The Site entrance will be gated, well maintained and monitored during the operational life of the proposed development. Regular maintenance will be undertaken to keep the site access track drainage systems fully operational and the road surface in good condition and to ensure there are no adverse issues affecting the public road network.	Operation
Chapter 13: Socio-Economics and Tourism		
Chapter 14: Forestry		
Compensatory Planting	Compensatory planting is calculated in accordance with Annex 5 of the Scottish Government's Policy on Control of Woodland Removal: Implementation Guidance February 2019. Accordingly, compensatory planting arrangements shall be provided for at least 37.36 ha of woodland.	Post Construction
Monitoring of Forest Operations	Monitoring of forest operations during construction shall be required to ensure compliance with good forestry practice during the removal and planting operations.	During Construction
UKFS Guidelines	Any forestry activities ongoing during operation of the wind farm, such as planting and maintenance will require no mitigation required for forestry or woodland other than following the UKFS guidelines. Similarly, the maintenance of the compensatory planting would follow UKFS guidance.	Post Construction, Operation
Replanting	The above controls will be required at the decommissioning stage should any of the decommissioned Site be replanted.	Decommission
Chapter 15: Other Issues		
Aviation Lighting	Aviation lights will be fitted to specific turbines in line with the Aviation Lighting Strategy (set out in EIAR Volume 4, Technical Appendix 15.1) as agreed with the CAA.	Operation
	To fulfil all CAA and MoD requirements, all 15 turbines will be fitted with Infra-Red (IR) Lights (at hub height), and 6 dominant, by position, turbines fitted with medium intensity ANO 2000/200cd Visible Red Lights to the nacelles. MOD IR lights have been developed to be invisible to the public at large but very detectable to aircrew night vision aids.	Operation

Subject	Detail of mitigation or monitoring commitment	Stage of Mitigation
	A total of six out of 15 of the proposed turbines will be fitted with visible aviation lights to fulfil the CAA's requirements	Operation
Telecommunications	Given the distance between the links and the turbine envelope, it is considered that the turbines are located suitably out with the telecoms links and therefore will not result in any effects upon these assets.	N/A