Scottish & Southern Electricity Networks

TRANSMISSION

Spittal – Loch Buidhe – Beauly 400 kV OHL Connection

Environmental Impact Assessment Scoping Report

October 2024

Scottish & Southern Electricity Networks
TRANSMISSION

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GLOSSARY

Term	Definition
400 kV	400 kilovolt (400,000 volt) operating voltage electrical circuit.
Access Strategy	Method for provision of access to the OHL alignment to facilitate construction eg the nature, indicative location and extent of temporary access tracks, permanent access tracks and road improvements.
Alignment (potential)	A centre line of an overhead line, along with the location of key angle structures.
Alignment (preferred)	An alignment for the overhead line taken forward to stakeholder consultation following a comparative appraisal of alignment options.
Alignment (proposed)	An alignment taken forward to consent application. It comprises a defined centre line for the overhead line and includes an indicative support structure (tower or pole) schedule, also specifying access arrangements and any associated construction facilities.
Amenity	The natural environment, cultural heritage, landscape and visual quality. Also includes the impact of SSEN Transmission's works on communities, such as the effects of noise and disturbance from construction activities.
Ancient Woodland Inventory (AWI)	A database of land that is currently wooded and has been continually wooded, at least since 1750.
Annex I (as listed on the EC Habitats Directive)	Annex I to the EC Habitats Directive lists the types of habitats and the animal and plant species whose conservation requires the designation of special areas of conservation. Some are defined as 'priority' habitats or species in danger of disappearing and for which there are specific rules.
AOD	Above Ordnance Datum
ASTI	Accelerated Strategic Transmission Infrastructure is a regulatory framework. This framework will assess, fund and incentivise the accelerated delivery of the large, strategic onshore transmission projects required to deliver the UK Government's ambition to connect up to 50 GW of offshore wind generation to the network by 2030[1].
Background Noise (BGN)	Background noise is the noise level in the absence of the industrial noise source under consideration.
Baseline Conditions	The physical, chemical, biological and cultural setting in which the Proposed Development is to be located, and where local impacts (both positive and adverse) might be expected to occur.
Bellmouth	Widened areas of access tracks at the junction of the track with the public road to facilitate turning of heavy vehicles into and out of the track.
Biodiversity Net Gain (BNG)	Biodiversity Net Gain (BNG) is an approach to development that aims to leave the natural environment in a measurably better state than it was pre-development. It focuses on the change in the biodiversity value of a site, comparing the pre and post construction biodiversity values to ensure a positive effect overall.
Birds of Conservation Concern (BoCC)	Birds of Conservation Concern (BoCC) provides the status of all regularly occurring birds in the UK, Channel Islands and Isle of Man. The current version is BoCC 5. Birds of highest conservation concern will appear on the Red List.
BoCC	Birds of Conservation Concern (BoCC) provides the status of all regularly occurring birds in the UK, Channel Islands and Isle of Man. The current version is BoCC 5, published December 2021. Birds of highest conservation concern will appear on the Red List.
Broadleaved Woodland	Broadleaved woodland is characterised by trees which do not have needles. Their leaves are broad and vary in shape, and most of them are deciduous. Broadleaved woodlands have 10% or less conifer in the canopy.

[1] Ofgem (2023) Decision to modify the special licence conditions in the electricity transmission licences: Accelerated Strategic Transmission Investment

Term	Definition
Class 1 and Class 2 Peatland	Class 1 – Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value. Class 2 – Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas of potentially high conservation value and restoration potential.
Commercial Forestry	Plantation woodlands typically dominated by conifer species and managed predominantly for timber extraction
Conductor	A metallic wire strung from structure to structure, to carry electric current.
Coniferous Woodland	Woodland that has 10% or less broadleaved trees in the canopy
Construction Environmental Management Plan (CEMP)	A site specific environmental management plan setting out the environmental management procedures, legislation and requirements for a particular project and site.
Construction Noise Impact Assessment (CNIA)	Construction Noise Impact Assessment. The basic principle of any noise impact assessment is to assess the change in the acoustic environment that will be brought about by the proposed development. The assessment of construction noise complies with best practice (BS5228), Code of Practice for Noise and Vibration Control on Construction and Open Sites.
Construction Noise Management Plan (CNMP)	A site specific noise management plan that demonstrate competence and commitment to controlling noise pollution. Developed in line with best practice (BS5228-1) by the Principal Contractor prior to starting construction works.
Consultation	The dynamic process of dialogue between individuals or groups, based on a genuine exchange of views, normally, with the objective of influencing decisions, policies or programmes of action.
Contaminated Land	Land contaminated by harmful substances including Unexploded Ordnance
Corridor	A linear area which allows a continuous connection between defined connection points. The corridor may vary in width along its length; in unconstrained areas it may be many kilometres wide.
Double Circuit	A double circuit transmission line comprises of two independent circuits each made up of three sets of conductors (cables).
Drinking Water Protected Areas (DWPA)	The water in ditches, streams, lochs and possibly groundwater in these areas is protected and likely to be taken to water treatment works, where it is treated and provided to the public as drinking water.
Effect	The change in condition of an environmental receptor (beneficial or adverse) arising as a result of a change brought about by the construction or operation of the Proposed Development.
Energy Consents Unit (ECU)	The department of the Scottish Government responsible for processing applications for consent under the Electricity Act 1989 on behalf of Scottish Ministers
Embedded Mitigation	Measures to avoid or reduce environmental impacts which are developed as an inherent part of the design of a project (eg reducing the height of a tower) or from adoption of specific design parameters (eg compliance with specific buffer distance from an environmental receptor).
Environmental Impact Assessment (EIA)	A formal process codified by EU directive 2011/92/EU, and subsequently amended by Directive 2014/52/EU. The national regulations are set out in The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. The EIA process is set out in Regulation 4(1) of the regulations and includes the preparation of an EIA Report by the developer to systematically identify, predict, assess and report on the likely significant environmental impacts of a proposed project or development.
EIA Regulations	The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017
European Designated Site	An area of land subject to protection through European legislation, including Special Areas of Conservation (SAC) and Special Protection Areas (SPA).

Term	Definition
European Protected Species (EPS)	Species of plants and animals (other than birds) protected by law throughout the European Union.
Forestry and Land Scotland (FLS)	Forestry and Land Scotland is the Scottish Government agency responsible for managing Scotland's national forests and land.
Gardens and Designed Landscapes (GDLs)	The Inventory of Gardens and Designed Landscapes lists those gardens or designed landscapes which are considered by a panel of experts to be of national importance.
General Environmental Management Plan (GEMP)	A series of standardised construction environmental management plans produced by SSEN Transmission.
Gigawatt (GW)	One billion watts.
Ground Water Dependent Terrestrial Ecosystem (GWDTE)	Wetlands which critically depend on groundwater flows. They are safeguarded by the Water Framework Directive (WFD) and are sensitive to hydrological and ecological changes.
Habitat	Term most accurately meaning the place in which a species lives, but also used to describe plant communities or agglomerations of plant communities.
Habitats Regulations Appraisal (HRA)	Appraisal to determine whether the Proposed Development will give rise to Likely Significant Effects on European designated sites in line with the Conservation (Natural Habitats, &c.) Regulations 1994.
Historic Environment Record (HER)	Sources of, and signposts to, information relating to landscapes, buildings, monuments, sites, places, areas and archaeological finds spanning more than 700,000 years. Based in mainly local authorities, they are used for planning and development control but also fulfil an educational role.
Historic Environment Scotland (HES)	Organisation responsible for investigating, caring for and promoting Scotland's historic environment.
Holistic Network Design (HND)	A single, integrated coordinated plan that sets out the onshore and offshore electricity transmission infrastructure required across GB, to deliver the UK Government's 2030 targets.
Impact	Physical constructions or activities that may change or disturb the surrounding environment (eg erection of an OHL tower may impact the landscape resource).
Kilovolt (kV)	One thousand volts.
Landscape Character Type (LCT)	A distinct, recognisable and consistent pattern of elements in a landscape that differentiate the area from another.
Landscape and Visual Impact Assessment (LVIA)	A chapter within the EIA Report to systematically identify, predict, assess and report on the likely significant landscape and visual impacts of a proposed project or development.
Listed Building	Building included on the list of buildings of special architectural or historic interest and afforded statutory protection under the 'Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997' and other planning legislation. Classified categories A – C(s).
Limit of Deviation (LOD)	The area either side of the proposed alignment within which micrositing of structures may take place in accordance with the conditions of the Section 37 consent.
Local Nature Reserve	Areas of natural heritage that are locally important.
Micrositing	The process of positioning individual structures to avoid localised environmental or technical constraints.
Mitigation	Term used to indicate avoidance, remediation or reduction of adverse impacts.
National Nature Reserve (NNR)	Areas of natural heritage that are nationally important.

Term	Definition
National Scenic Area (NSA)	A national level designation applied to those landscapes considered to be of outstanding scenic value in a national context.
Native Woodland	Woodland recorded on the Native Woodland Survey of Scotland (NWSS) . The NWSS identified and mapped the location, extent, type and condition of all of Scotland's native woodlands. Launched in 2014, it was the first authoritative inventory of Scotland's native woods and created a baseline for future monitoring of change
NatureScot	Scotland's statutory nature conservation agency (formerly Scottish Natural Heritage (SNH)).
Noise Sensitive Receptors (NSR)	Noise sensitive receptors are defined as receptors which are potentially sensitive to noise and vibration. Examples include dwellings, hospitals, schools and community facilities.
Operational Corridor (OC)	The area either side of the OHL which needs to remain clear of trees.
Ordnance Survey (OS)	Great Britain's national mapping agency.
Overhead Line (OHL)	An electric line installed above ground, usually supported by lattice steel towers or poles.
Plantation Woodland	Woodland of any age that obviously originated from planting.
Proposed Development	A new double circuit steel structure 400 kilovolt (kV) overhead transmission line (OHL) to connect into proposed new substation sites at Spittal, Loch Buidhe and Beauly.
Ramsar	A wetland site designated to be of international importance under the Ramsar Convention.
Route	A linear area of approximately 1 km width (although this may be narrower/wider in specific locations in response to identified pinch points / constraints), which provides a continuous connection between defined connection points.
Route (preferred)	A route for the overhead line taken forward to stakeholder consultation following a comparative appraisal of route options.
Route (proposed)	A route taken forward following stakeholder consultation to the alignment selection stage of the overhead line routeing process.
Routeing	The work undertaken which leads to the selection of a proposed alignment, capable of being taken forward into the consenting process under Section 37 of the Electricity Act 1989.
Royal Society for the Protection of Birds (RSPB)	The RSPB is a non-statutory body incorporated by Royal Charter and registered as a charity since 1968. The RSPB works to protect and restore the natural world for birds and other wildlife.
Scoping Opinion	An opinion adopted by the Scottish Ministers as to the scope and level of detail of information to be provided in the EIAR
Scottish Biodiversity List (SBL)	The Scottish Biodiversity List is a list of species and habitats of particular importance for the conservation of biodiversity in Scotland.
Scottish Environment Protection Agency (SEPA)	Scotland's principal environmental regulator, protecting and improving Scotland's environment.
Scheduled Monument	A monument which has been scheduled by the Scottish Ministers as being of national importance under the terms of the 'Ancient Monuments and Archaeological Areas Act 1979'.
Section	Due to the length of the project, it has been necessary to split the broad corridor into 'sections' to more easily describe, identify and assess route options. There are five sections from Section A to Section E.
Section 37 Application	An application for development consent under section 37 of the Electricity Act 1989.

Term	Definition
Semi-natural Woodland	Woodland that does not obviously originate from planting. The distribution of species will generally reflect the variations in the site and the soil. Planted trees must account for less than 30% of the canopy composition.
Sites of Special Scientific Interest (SSSI)	Areas of national importance. The aim of the SSSI network is to maintain an adequate representation of all natural and semi-natural habitats and native species across Britain.
Span	The section of overhead line between two supporting structures.
Special Area of Conservation (SAC)	An area designated under the EC Habitats Directive to ensure that rare, endangered or vulnerable habitats or species of community interest are either maintained at or restored to a favourable conservation status.
Special Landscape Area (SLA)	Special Landscape Areas (SLAs) are regionally valuable landscapes identified by a local planning authority (The Highland Council) to protect and enhance landscape qualities and promote their enjoyment.
Special Protection Area (SPA)	An area designated under the Wild Birds Directive (Directive74/409/EEC) to protect important bird habitats.
Species Protection Plan (SPP)	Developed by the Applicant to document general procedures, legislation and requirements for ensuring protection to a variety of species.
SSEN Transmission	Scottish Hydro Electric Transmission plc is a wholly owned subsidiary of the SSE plc group of companies. Operating and known as Scottish and Southern Electricity Networks Transmission (SSEN Transmission) it owns and maintains the electricity transmission network across the north of Scotland and remote islands. It holds a licence under the Electricity Act 1989 to develop and maintain an efficient, co-ordinated and economical system of electricity transmission.
Stakeholders	Organisations and individuals who can affect or are affected by SSEN Transmission works.
Study Area	A defined area for the consideration of environmental effects (including direct, indirect and cumulative) on each relevant factor listed under Regulation 4(3) of the EIA Regulations.
Substation	A node on the network to allow safe control of the electricity network. This could include convergence of multiple circuits, transformation of voltage or other functions to maintain and operate the electricity network.
The National Grid	The electricity transmission network in Great Britain.
UK Habitat Survey (UKHab)	The UK Habitat Classification is a unified and comprehensive approach to classifying habitats, designed to provide a simple and robust approach to survey and monitoring for the 21st Century.
Underground Cable	An electric cable installed below ground, protected by insulating layers and marked closer to the surface to prevent accidental damage through later earthworks.
Volts	The international unit of electric potential and electromotive force.
Wayleave	A voluntary agreement entered into between SSEN Transmission and a landowner upon whose land an overhead line is to be constructed for the installation and retention of the transmission equipment.
Wild Land Area (WLA)	A series of 42 mapped areas which have been identified by NatureScot as comprising the most extensive areas of high wildness within Scotland, following a process of interpretive mapping and site survey. WLA is not a statutory designation but these areas are considered to be nationally important.
Zone of Theoretical Visibility (ZTV)	The computer generated plan showing the theoretical visibility of an object in the landscape.

EXECUTIVE SUMMARY

This Scoping Report has been prepared by Environmental Resources Management (ERM) on behalf of Scottish Hydro Electric Transmission plc ("the Applicant") who, operating and known as Scottish and Southern Electricity Networks Transmission ("SSEN Transmission"), owns, operates and maintains the electricity transmission network across the north of Scotland and the Scottish islands. In this Scoping Report, the Applicant and SSEN Transmission are used interchangeably unless the context requires otherwise.

The Applicant is proposing to submit an application for consent to construct and operate a new 400 kilovolt (kV) overhead transmission line (OHL) over a distance of approximately 167 km, between new proposed substations at Spittal, Loch Buidhe and Beauly. The project being promoted is known as the Spittal – Loch Buidhe – Beauly 400 kV OHL Connection and it is referred to in this report as the Proposed Development.

In order to support the continued growth in onshore and offshore renewables across the North of Scotland, supporting the country's drive towards Net Zero, further investment in electricity transmission infrastructure is needed to connect this renewable power into the grid and transport it from source to areas of demand across the country.

Spittal to Beauly has been identified by SSEN Transmission as a key corridor in establishing this required reinforcement, connecting into proposed new substation sites at Spittal (Banniskirk), Loch Buidhe (Carnaig) and Beauly (Fanellan) along the way. This project requires new 400 kV connection infrastructure, which is expected to be achieved primarily via OHL technology.

As the Proposed Development falls within the project categories listed in Schedule 1 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 an Environmental Impact Assessment (EIA), supported by appropriate surveys and specialist assessments, will be carried out to inform an EIA Report. This will form part of an application to Scottish Ministers under section 37 of the Electricity Act 1989 for consent to construct the project.

This Scoping Report is provided to support a formal request under Regulation 12 of the EIA Regulations by the Applicant for the Scottish Ministers to adopt a Scoping Opinion to determine the scope and level of detail of information to be provided in the EIA report. Regulation 5(3) provides that *'Where a scoping opinion is adopted, t**he EIA report must be based on that scoping opinion** and must include the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the development on the environment, taking into account current knowledge and methods of assessment.'* (Emphasis added) The purpose of this report is therefore to assist the Scottish Ministers in identifying clear parameters for the EIA report (which, in turn, can be followed by the Applicant). With reference to Regulation 12(4), the Applicant suggests that the Scottish Ministers invite consultees to comment on the following issues as part of the mandatory consultation process:

- What environmental information do you hold or are aware of that will assist in the EIA described here?
- Do you agree with the proposed approach for baseline collection, and that the range of surveys across particular topics is sufficient and appropriate to inform the assessment of environmental effects?
- Is there any other relevant existing baseline data that should be taken into account?
- Are there any key issues or possible effects which have been omitted?
- Do you agree with the list of issues to be scoped out, and the rationale behind the decision?

Responses to this Scoping Report should be directed to the Energy Consents Unit (ECU) of the Scottish Government to ensure all responses are collated and included within the Scoping Opinion. Responses should be directed to:

Email: Econsents_Admin@gov.scot

OR

Energy Consents Unit

Scottish Government

4th Floor

5 Atlantic Quay

150 Broomielaw

Glasgow

G2 8LU

When submitting a response to the Scoping Report, the Applicant would be grateful if you could also send a copy of your response to the address below:

Email: Tara.Cowley@sse.com.

The Scoping Opinion provided will be used to finalise the terms of the EIA and the specific approach to the individual assessments.

All comments received will be included in the EIA Report for reference, unless consultees request otherwise.

1. INTRODUCTION

1.1 The Proposals

1.1.1 Scottish Hydro Electric Transmission plc ('the Applicant') operating and known as Scottish and Southern Electricity Networks Transmission ("SSEN Transmission") own, operate and develop the high voltage electricity transmission system in the north of Scotland and the Scottish islands. It holds a transmission licence under the Electricity Act 1989, and is subject to a statutory duty to '*develop and maintain an efficient, coordinated and economical system of electricity transmission.*' SSEN Transmission also has obligations to offer non-discriminatory terms for connection to the transmission system, both for new generation and for new sources of electricity demand. In this Scoping Report, the terms Applicant and SSEN Transmission are used interchangeably unless the context requires otherwise.

1.1.2 The Applicant is proposing to submit an application for consent to construct and operate a new double circuit steel structure 400 kilovolt (kV) overhead transmission line (OHL) to connect into proposed new substation sites at Spittal, Loch Buidhe and Beauly. The project is referred to as the Spittal to Loch Buidhe to Beauly 400kV Connection Project (and hereafter as 'the Proposed Development') and will be contained wholly within the local planning authority area of The Highland Council (THC).

1.1.3 Extensive studies completed to inform the Electricity System Operator's (ESO's) 'Pathway to 2030' Holistic Network Design (HND) study have identified the need to reinforce the onshore electricity transmission corridor between Spittal and Beauly. Providing a new 400 kV OHL connection between these locations enables the significant power transfer needed to transmit power from future large scale onshore and offshore sources of low carbon renewable energy generation to areas of demand.

1.1.4 The Proposed Development provides for future transmission infrastructure requirements, particularly having regard to targets fixed by the Scottish and United Kingdom (UK) Governments to achieve net zero by 2045 and 2050 respectively. The policy objective of "net zero" is the reduction of carbon emissions by 100 % from 1990 levels by 2050 in order to avoid the worst impacts of climate change and seeks to limit global warming to 1.5 degrees centigrade. This target applies to all sectors of the economy, including energy.

1.1.5 Given the linear scale of the Proposed Development, this Scoping Report (and previous route consultation exercises) splits the project into five geographically defined 'Sections'. These 'Sections' are broadly defined as follows:

- Section A – Spittal to Brora;
- Section B – Brora to Loch Buidhe;
- Section C – West of Dornoch;
- Section D – Dornoch to Dingwall; and
- Section E – Dingwall to Beauly.

1.2 The EIA Regulations

1.2.1 An application for consent for the OHL will be made to the Scottish Ministers under section 37 of the Electricity Act 1989, along with a request for a direction that planning permission be deemed to be granted under section 57 (2) of the Town and Country Planning (Scotland) Act 1997, as amended, for construction and operation of the OHL and carrying out of ancillary works.

1.2.2 For the purposes of the application under Section 57 (2), the ancillary development will include:

- the formation of 'bellmouths' (i.e. junctions with curved entry and exit points) for connections to public roads;
- temporary and permanent construction access tracks and tower working areas;

- cable sealing end compounds, which are required at the interface between overhead lines and underground cables;
- construction compounds (where these are currently known);
- 'borrow pits' to provide stone (where these are currently known);
- vegetation clearance and management;
- other temporary measures required during construction.

1.2.3 Underground cables could be required in association with the Proposed Development.

1.2.4 The applicable EIA Regulations are the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, hereafter referred to as the "EIA Regulations". Schedule 1 of the EIA Regulations lists projects where EIA is mandatory. The Proposed Development is categorised as 'Schedule 1' under category (3) "*construction of overhead electrical power lines with a voltage of 220 kilovolts or more and a length of more than 15 kilometres*". The Applicant is therefore obliged to prepare an EIA Report to accompany the application for consent, in accordance with the requirements of the EIA Regulations.

1.2.5 Modification of the existing electricity transmission network (132 kV and above) will be required in specific areas to accommodate the new OHL. These works will generally form part of the application for consent under section 37 of the Electricity Act 1989 for the Proposed Development and will be assessed as part of the EIA

1.2.6 Modification of the existing electricity distribution network in some areas is also likely to be required to accommodate the new OHL. These works do not form part of the consent under section 37 of the Electricity Act 1989 for the Proposed Development but are a consequence of its construction. These works will therefore be assessed as 'associated works' for the purposes of the EIA.

1.2.7 The substations works are being progressed separately and do not form part of the Proposed Development. These works consist of proposed new substations at Spittal (Banniskirk), Loch Buidhe (Carnaig) and Beauly (Fanellan) and upgrades to the existing substations at these locations. Planning permission for the proposed and upgraded substations and for the connections to the proposed OHL will be sought under the Town and Country Planning (Scotland) Act 1997 (as amended). The potential for 'intra-project' cumulative effects (e.g. additional effects due to the interaction between these Accelerated Strategic Transmission Investment (ASTI) projects) will be assessed as part of the EIA. The connections between the substations and the proposed OHL will also be assessed as part of the EIA.

1.2.8 'Inter-project' cumulative effects will also be assessed as part of the EIA. These are additional effects arising from the combination of the Proposed Development and third party projects.

1.3 Sustainability Strategy

1.3.1 A key part of SSEN Transmission's Sustainability Strategy[2] is to achieve Biodiversity Net Gain (BNG)[3] [4] as part of the delivery of each project. As such, the ambition is to ensure that activities not only maintain the existing ecological balance but also enhance biodiversity. For new infrastructure projects, the Applicant proposes to:

[2] SSEN Transmission (2023) Sustainability Strategy. Available at: https://www.ssen-transmission.co.uk/about-us/sustainability-andenvironment/sustainability-strategy/

[3] SSEN Transmission (2019) *A Network for Net Zero: Our Approach to Implementing Biodiversity Net Gain*. Available at: https://www.ssentransmission.co.uk/globalassets/documents/a-network-for-net-zero/supporting-evidence/our-approach-to-implementing-biodiversity-netgain-.pdf

[4] SSEN Transmission (2023) *Delivering for Nature and Net Zero on World Biodiversity Day by committing to biodiversity net gain on all our projects*. Available at: https://www.ssen-transmission.co.uk/news/news--views/2023/5/delivering-for-nature-and-net-zero-on-worldbiodiversity-day-by-committing-to-biodiversity-net-gain-on-all-our-projects/ and SSEN Transmission Delivering a positive environmental legacy, Available at: https://www.ssen-transmission.co.uk/globalassets/documents/sustainability-and-environment/environmental-legacybooklet

- ensure natural environment considerations are included in decision making at each stage of a project's development;
- utilise the mitigation hierarchy to avoid impacts by consideration of biodiversity in project design;
- achieve Biodiversity Net Gain of 10% or more on all new infrastructure projects gaining consent from May 2023 onwards; and
- work with the supply chain to understand enhancement opportunities to gain the maximum benefit during asset replacement and upgrades, which includes development of new infrastructure.

1.3.2 BNG is a key consideration throughout project development and is discussed further in **Chapter 7: Ecology and Nature Conservation**.

1.4 Purpose of the EIA Scoping Report

1.4.1 The purpose of this EIA Scoping Report is to seek the opinion and agreement of the consenting authorities as to elements of the Proposed Development that require to be subject to assessment, in order to ensure that the subsequent EIA is focused on the *'likely significant effects*' of the Proposed Development (and thus meet the requirements under Regulation 4(3) and Schedule 4 of the EIA Regulations). As well as identifying topics to be assessed in the EIA, this document also expresses the Applicant's view (for consideration by the Scottish Ministers) on topics that do not require to be included within the scope of the EIA report. All relevant environmental issues are considered to confirm that the assessment process described will meet legislative requirements.

1.4.2 In accordance with the EIA Regulations, this EIA Scoping Report contains:

- A plan sufficient to identify the location of the Proposed Development;
- A brief description of the nature and purpose of the Proposed Development and its possible effects on the environment; and
- information and representations from the Applicant on the aspects of the Proposed Development or environment that are not considered necessary to assess further in the EIA Report.

1.4.3 This EIA Scoping Report has been issued to the Scottish Government – Energy Consents Unit (ECU) to inform the preparation of their Scoping Opinion.

1.4.4 The Applicant recommends to the Scottish Ministers that consultees comment on the following:

- What environmental information do you hold or are aware of that will assist in the EIA described here?
- Do you agree with the proposed approach for baseline collection, prediction and significance assessment?
- Are there any key issues or possible effects which have been omitted?
- Do you agree with the list of issues to be scoped out, and the rationale behind the decision?
- Of those issues identified for assessment, which do you consider the most important / material and which the least?

1.5 Scoping Report Methodology

1.5.1 This EIA Scoping Report provides information on the individual factors which require consideration under Regulation 4(3) of the EIA Regulations. This EIA Scoping Report presents the findings of an initial appraisal of the likely environmental effects of the Proposed Development on the receiving environment. It provides a basic overview of the baseline conditions as understood at the time of writing and the likely potential effects of the Proposed Development (to inform a scoping decision as

to whether they are likely to be *'significant'*). Where site survey and further assessment are deemed necessary (i.e. because the effects are likely to be significant), the methodologies that will be used in the EIA are outlined in the relevant section.

1.5.2 Environmental topics identified for assessment in the EIA Report are:

- Landscape and Visual Amenity;
- Ecology and Nature Conservation;
- Ornithology;
- Cultural Heritage;
- Geological Environment (Soil, Peat and Geology);
- Water Environment (Hydrology and Hydrogeology);
- Traffic and Transport;
- Noise and Vibration;
- Forestry;
- Recreation and Tourism; and
- Climate Change (Land Use Change Carbon)[5].

1.5.3 Other Issues that the Applicant considers can be Scoped out of the EIA Report (for the reasons discussed elsewhere in this report) are as follows:

- Land Use;
- Air Quality;
- Material Assets and Waste;
- Major Accidents and Disasters;
- Electric and Magnetic Fields;
- Radio and TV Interference;
- Population and Human Health;
- Socio Economics; and
- Climate Change (Life cycle/embodied Carbon).

1.5.4 The proposed scope of the EIA Report is set out within this Scoping Report on a topic by topic basis.

1.5.5 For each topic, an overall description of the baseline environment is provided relevant to that topic. This is followed by a summary of the potential effects associated with each environmental topic listed above, and the proposed scope of survey and assessment work to determine effects and identify appropriate mitigation measures. The report also provides a summary of the topics that, in the Applicant's view, can be scoped out (together with the rationale in support of that view for consideration by the Scottish Ministers when adopting the Scoping Opinion).

1.6 Corridor, Route and Alignment Selection

1.6.1 A detailed route selection process is being undertaken to identify a OHL alignment which best balance environmental, technical and economic factors. Environmental designations and key sensitive receptors will be avoided where possible throughout the process. The process typically consists of three stages: 'corridor', 'route', and 'alignment'. A combined corridor and routeing consultation exercise was undertaken initially for the Proposed Development, since corridor and route options did not differ significantly for those stages in relation to engineering, environmental and other constraints. Options are identified, appraised and then consulted on at each stage before decisions are made and the design moves to the following stage. Each stage presents more detailed options

[5] Methodology included in Chpater 10: Geological Environment.

than the previous, to ultimately arrive at the Proposed Alignment which will be taken into the EIA. This Scoping report is based on refined route information rather than on a Proposed Alignment (see paragraph 1.6.4 below).

1.6.2 Information on the Proposed Development was initially made available to the public and statutory authorities in March 2023. In August 2023, a more detailed Consultation Document was prepared to set out the project need and describe the Spittal – Loch Buidhe – Beauly 400 kV Connection Project, seeking comments from stakeholders and members of the public on the route option studies undertaken, and the rationale for, and approach to, the selection of the preferred route[6]. Comments received were documented in a Report on Consultation (December 2023)[7].

1.6.3 The Report on Consultation (December 2023) also confirmed the preferred routes to be taken forward as the proposed OHL route for the consideration of alignment options. The Report on Consultation confirmed that as a result of feedback received from the statutory consultees, communities and the general public, and with consideration for the sensitivities and challenges present within specific sections, further engineering and environmental review of the route options available was required prior to identifying a potential alignment.

1.6.4 Work is currently being undertaken to identify and appraise OHL alignment options and identify a Proposed Alignment subject of consideration in the EIA Report. Scoping has been based on the refined route information presented in March 2024 together with additional options which were identified through consultation. For consistency, and as more recent options and some technically challenging sections remain under consideration, the Scoping report is based on refined routes.

1.6.5 The location of the proposed new substations required at Spittal, Loch Buidhe and Beauly, into which the Proposed Development will connect, has been informed by separate site selection studies and consultation with stakeholders and the public.

1.7 OHL Contractor

1.7.1 SSEN Transmission has engaged an experienced OHL construction contractor to explore the advantages, disadvantages and constructability of OHL alignment options in order to inform the identification of a Preferred Alignment,. This has proven valuable at this early stage of the project in terms of providing confidence in the buildability of alignment options, and construction access opportunities. Whilst the full access strategy is still being developed, construction and operational access requirements will be a key consideration in informing the Preferred Alignment, utilising existing access where possible and identifying access routes to facilitate the OHL.

[6] SSEN Transmission, (August 2023) *Spittal – Loch Buidhe – Beauly 400 kV Connection Consultation Document*
[7] SSEN Transmission, (December 2023) Spittal – Loch Buidhe – Beauly 400 kV Connection *Report on Consultation*

2. DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Introduction

2.1.1 The Proposed Development consists of the construction of a new 400 kV OHL between Spittal, Loch Buidhe and Beauly. The works will involve:

- Construction of approximately 85 km of a new 400 kV double circuit OHL on steel lattice towers between the proposed new Spittal (Banniskirk) and Loch Buidhe (Carnaig) 400 kV substations;
- Construction of approximately 82 km of a new 400 kV double circuit OHL on steel lattice towers between the proposed new Loch Buidhe (Carnaig) and Beauly (Fanellan) 400 kV substations;
- Construction of temporary and permanent access tracks along the length of the OHL route;
- Rationalisation of existing high voltage and low voltage infrastructure at points of crossing along the new OHL routes, and around new and existing substation sites; and
- Ancillary development including: the formation of 'bellmouths'; temporary and permanent construction access tracks and tower working areas; cable sealing end compounds; construction compounds (where known); 'borrow pits' (where known); vegetation clearance and management; and other temporary measures required during construction.

2.1.2 As per paragraph 1.2.3, underground cables could be required in association with the Proposed Development.

2.1.3 This Scoping report is based on the Proposed Routes illustrated in **Appendix A**, **Figure 2.1** and shown on the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[8]**.**

2.2 The Need for the Project

2.2.1 As a result of the Scottish and UK Governments' Net Zero climate change targets, together with requirements set out in the BESS[9] and subsequently in National Grid ESO "Pathway to 2030" HND[10], significant increases in renewable generation capacity are required, resulting in significant investment in new transmission network infrastructure.

2.2.2 The BESS sets out the UK Government's plans to secure the country's future energy independence by reducing the dependence on, and price exposure to, volatile global wholesale gas markets. This will be achieved by accelerating the deployment of homegrown and affordable low carbon electricity generation, together with accelerating the enabling electricity network infrastructure required to connect and transport this power. The BESS included an increased ambition for offshore wind generation of 50 Gigawatts (GW) by 2030, up from the previous target of 40 GW.

2.2.3 To enable the connection of that 50 GW of offshore wind by the 2030 target date, the GB Electricity System Operator (the ESO), working in collaboration with the three GB Transmission Owners, developed the HND which sets out the onshore and electricity transmission infrastructure required across GB to deliver this UK Government target, including projects in the Applicant's Licence Area across the north of Scotland.

2.2.4 Caithness and the surrounding area is home to some of Scotland's best wind resources and the existing electricity transmission network is at full capacity, meaning the planned new renewable energy generation required by BESS can't connect without significant network reinforcement.

2.2.5 As part of the wider UK network reinforcements detailed in the BESS and HND, reinforcements required in the Applicant's licence area include proposed new 400 kV links between Spittal and

[8] 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)

[9] HM Government (2022) *British energy security strategy*. Available online: https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy

[10] National Grid ESO (2022) *Pathway to 2030: A holistic network design to support offshore wind deployment for net zero*. Available online: https://www.nationalgrideso.com/document/262676/download

Beauly, and between Peterhead and Beauly. This will transmit electricity generated by renewables in the north / east of Scotland to areas of demand on the wider GB transmission network, as well as reinforcing the network in Scotland. In addition, new subsea links between Spittal and Peterhead, and from Peterhead to the north of England are required.

2.2.6 In December 2022 the energy regulator, Ofgem, approved the need for these projects as part of its Accelerated Strategic Transmission Investment (ASTI) framework decision[11].

2.2.7 These projects, alongside several other major network upgrades planned in the north of Scotland, are therefore part of a GB-wide programme of works that are required to meet UK and Scottish Government energy targets; there is a clear expectation from Government and the energy regulatory, Ofgem, that these projects will be delivered by 2030. More specifically, these projects are needed to deliver Government 2030 renewable targets set out in the BESS. Further information relating to the Pathway to 2030 projects can be found at https://www.ssen-transmission.co.uk/projects/2030-projects/.

2.3 Proposed Development Components

2.3.1 As noted above, the Proposed Development will comprise steel lattice towers from the SSEN Transmission ASTI SSE400 tower suite. The size of towers and span lengths is generally dependent on three main factors: altitude; weather; and the topography of the route. Towers are typically closer together at high altitudes to withstand the effects of greater exposure to high winds, ice and other weather events. Higher towers may be required in certain locations to maintain the required ground clearance heights, such as at road, river and rail crossings.

2.3.2 Some permanent access tracks will also be required to be constructed.

2.3.3 Rationalisation works which may involve some undergrounding of existing lines is also being considered, where a significant benefit is identified. Where this relates to electricity transmission infrastructure (132 kV and above) it is included as part of the Proposed Development.

2.3.4 Modification of the existing electricity distribution network in some areas is also likely to be required to accommodate the new OHL. These works do not form part of the Proposed Development but are included here as 'associated works' for the purposes of the EIA.

2.4 Associated Works

2.4.1 The Proposed Development will give rise to a need to supplement some of the existing substation infrastructure along the route of the new OHL. The proposed substation works are summarised below:

- Banniskirk Hub (formerly referred to as Spittal Substation): installation of a new outdoor 400kV substation complete with 400kV double busbar arrangement and a HVDC converter station. The substation will either be an Air Insulated Switchgear (AIS) substation or Gas Insulated Switchgear (GIS) substation with two new super grid transformers (SGT) and a new substation control building.
- Carnaig Substation (formerly referred to as Loch Buidhe Substation): installation of a new outdoor, AIS, 400 kV substation complete with 400 kV double busbar arrangement which will include new SGT and a new substation control building.
- Fanellan Hub (formerly referred to as Beauly Substation): installation of a new outdoor, AIS, 400 kV substation and a HVDC converter station.

2.4.2 These works will require applications for planning permission under the Town and County Planning (Scotland) Act 1997 (as amended). The works are classed as National Development within National

[11] Ofgem (2022) *Decision on accelerating onshore electricity transmission investment*. Available online: https://www.ofgem.gov.uk/publications/decision-accelerating-onshore-electricity-transmission-investment

Planning Framework (NPF) 4 and as such require formal Pre-Application Consultation. The Applicant has submitted Proposal of Application Notices (PANs) for these projects and will continue to consult with the local community as well as with THC. The Applicant has also confirmed to THC that they will progress the works at each substation site as EIA development, owing to the intrinsic connection between the proposed substations and the proposed development the subject of this Scoping Report, and will therefore prepare an EIA Report to accompany the planning application for each site. However, the connections between the substations and the proposed OHL will be assessed as part of the EIA of the Proposed Development.

2.4.3 Separate scoping exercises will be undertaken with THC to determine an appropriately scoped EIA Report for each of the substation projects.

2.5 Limit of Deviation

2.5.1 The section 37 application will seek consent for the construction and operation of the OHL, specifying a centre line, locations of terminal and angle supporting structures with a prescribed horizontal Limit of Deviation (LOD) to allow flexibility in the final siting of individual towers and construction access to reflect localised land, engineering and environmental constraints.

2.5.2 The horizontal LOD, for which consent will be sought, will be refined through the EIA process, and will ultimately seek to balance the need for flexibility in micro-siting with the desirability of avoiding, reducing or controlling the potential for environmental impact. It is anticipated the LOD will generally be 100 m either side of proposed infrastructure; however, it may vary depending on local constraints.

2.5.3 A vertical LOD, i.e. the maximum height of a pole or tower above ground level, would be confirmed through the EIA process as more detailed design information is obtained. Whilst indicative tower heights are known based on standard tower designs (see **Section 2.6** below), some structure heights may vary depending on topography. It is anticipated that a vertical LOD of up to 9m will apply in general but this will be subject to individual tower type and location and will be assessed as part of the LVIA.

2.6 OHL Design

Physical Characteristics of the OHL

2.6.1 The steel structures will be of lattice design from the SSEN Transmission ASTI SSE400 tower suite. Towers would be 57 m above ground level in height on average, with a maximum extension height of up to 70 m, although tower heights may be increased where local topography dictates in order to achieve sufficient clearance distances.

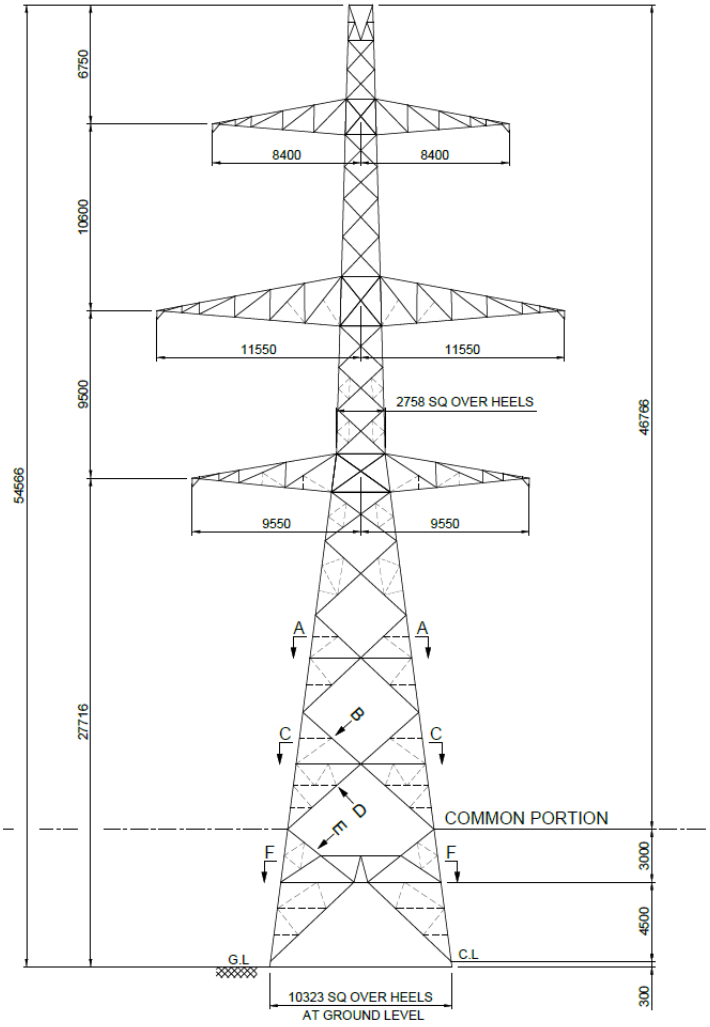
2.6.2 The proposed steel lattice towers would support six conductor bundles (3 electrical wires per bundle) on six cross-arms (three on each side) and an earth wire between the peaks. The span lengths between towers would vary depending on topography and altitude but would be approximately 350 m apart on average. Exact heights of and the distances between towers would be determined after a detailed line survey and confirmed prior to submission of an application for consent.

2.6.3 Typical tower designs can be seen in **Plate 2.1**[12] and a schematic of the proposed steel lattice towers is shown in **Plate 2.2**.

[12] The existing SSE400 tower suite design is currently being modified to provide stronger tower structures. The final tower design and appearance may differ slightly from the existing SSE400 tower suite shown in Plate 2.1.

Plate 2.1 Existing SSE400 steel lattice tower design

Plate 2.2 Proposed ASTI SSE400 steel lattice tower typical schematic



2.7 OHL Construction

2.7.1 High voltage OHL construction typically follows a standard sequence of events as follows:

- Phase 1 – enabling works;
- Phase 2 – OHL construction;
- Phase 3 – OHL commissioning; and
- Phase 4 – re-instatement.

2.7.2 Further detail on typical construction activities and work methods will be described in the EIA Report. An outline of the likely programme, phasing and working methods is provided here for the purpose of informing the initial scoping stage environmental assessment.

Construction Programme

2.7.3 It is anticipated that construction of the proposed OHL would take place over a four year period, although detailed programming of works would be the responsibility of the Principal Contractor in agreement with SSEN Transmission. It is anticipated that construction of the proposed OHL would commence in 2026, with an estimated completion date of October 2030. The detailed construction phasing and programme would be subject to change as the design progresses and also due to necessary consents and wayleaves being agreed. Further information will be provided in the EIA Report on the indicative construction programme.

Standard Mitigation and Working Methods

2.7.4 The initial scoping appraisal and the assessment in the EIA Report will be carried out on the basis that standard mitigation measures will be implemented during the construction work, including compliance with both project wide and site specific environmental management procedures, with reference to General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs).

2.7.5 A Construction Environment Management Plan (CEMP) will be developed for the Proposed Development and adopted by the successful contractor during the construction phase. The principal objective of this document is to provide information on the proposed infrastructure and to aid in avoiding, minimising and controlling adverse environmental impacts associated with construction of the Proposed Development. Furthermore, the CEMP will aim to define good construction practice as well as specific actions required to implement mitigation identified in the EIA Report, the planning process and / or other licencing or consenting processes. The CEMP would be updated during the pre-construction phase and would form part of the contractor documents between the Applicant and the appointed construction contractor.

2.8 Construction practices and phasing

Phase 1 - Enabling works

Existing Distribution Lines

2.8.1 Works would be required to some existing electricity distribution network infrastructure to facilitate safe working and operating conditions given the proximity of the existing OHLs to the proposed OHL. It is anticipated that some of these network assets may be realigned or partially undergrounded in some locations to make way for the Proposed Development. Specific details are not available at this stage, but it is anticipated that any works would be carried out under Permitted Development rights. For electricity distribution infrastructure these works do not form part of the Proposed Development but are included here as 'associated works' for the purposes of the EIA with the potential for cumulative effects assessed as part of the EIA.

Existing Transmission Lines

2.8.2 Works would also be required to existing 132 kV and 275 kV transmission network infrastructure. These works will generally form part of the application for Section 37 consent and will be assessed as part of the EIA.

Road Improvements and Access

2.8.3 The access strategy will be described in the EIAR and application for Section 37 consent with typical junction/access proposals included. subject to on-going development during the design process.

2.8.4 Where possible, existing access tracks will be used and upgraded as required. New access tracks may be required and where there is a justified long-term requirement, they will be left in place.

2.8.5 Where ground conditions permit, it is preferable to construct the infrastructure without an access track (for example on dry and level pasture). Temporary matting may be used in sensitive areas subject to an assessment of gradients and ground conditions.

2.8.6 New access tracks (permanent or temporary) would generally be constructed using a geotextile, with approximately 200 mm of crushed and compacted stone laid on top. Tracks may be floated over areas of peat; alternatively cut and fill approaches may be used, subject to ground conditions and gradients.

Forestry Clearance

2.8.7 The Proposed Development would pass through or close to areas of woodland and commercial forestry, as discussed in **Chapter 14: Forestry**. Construction of the Proposed Development will require the removal of sections of commercial forest, which will be undertaken in consultation with Scottish Forestry and affected landowners.

2.8.8 After felling, any timber removed that is commercially viable would be sold and the remaining forest material would be dealt with in a way that delivers the best practicable environmental outcome and is compliant with waste regulations.

2.8.9 Where the Proposed Development passes through areas of woodland or forestry, a wayleave corridor would be required. The width of this corridor would be variable depending on the nature of the woodland or forestry.

Temporary Site Compounds

2.8.10 It is currently anticipated that a number of construction compounds and laydown areas would be required given the scale of the Proposed Development, the locations of which will be confirmed by the Principal Contractor at a future time

Phase 2 – Construction works

Foundations

2.8.11 Different approaches to forming foundations may be used for steel lattice towers, subject to ground conditions at each location. These are likely to comprise:

- spread type e.g. concrete pad and chimney; or
- piled type e.g. driven concrete, tube and micro pile; or augered.

2.8.12 Foundation types and designs for each tower will be confirmed following detailed geotechnical investigation at each position.

Steel Lattice Tower Construction

2.8.13 Tower construction can typically commence two weeks after the foundations have been cast, subject to weather conditions and concrete curing rates. Tower steelwork would be delivered to each tower construction site either as individual steel members or as prefabricated panels, depending on the method of installation and the available access. A working area, up to approximately 100 m x 100 m, is required at each tower location to facilitate access, laydown and assembly.

Conductor Stringing

2.8.14 The conductor would be delivered to site on wooden drums in pre-determined pulling section lengths. Prior to stringing the conductors, temporary protection measures (e.g. netted scaffolds), would be required across public roads and existing access tracks.

2.8.15 Conductor stringing equipment (i.e. winches, tensioners and ancillary equipment) are set out at either end of pre-selected sections of the OHL.

2.8.16 Pilot wires would be pulled through the section to be strung. These would be hung on blocks (wheels) at each suspension tower and connected to a winch and tensioner at the respective end of the section. The winch, in conjunction with the tensioner, is used to pull the pilot wires between the structures. The conductor is pulled via the pilot wires through the section under tension to avoid contact with the ground and any underrunning obstacles. Once the conductor has been strung between the ends of the section it is then tensioned and permanently clamped at each pole / tower.

Phase 3 - Commissioning

2.8.17 The OHL and support towers will then be subject to an inspection and snagging process. This allows the Principal Contractor and SSEN Transmission to check that the works have been built to specification and are fit to energise. The Proposed Development will also go through a commissioning procedure for the switchgear, communications and protection controls through the substations at Spittal, Loch Buidhe and Beauly. The circuits will then be energised from the substations in a phased sequence.

Phase 4 - Reinstatement

2.8.18 Following commissioning of the Proposed Development, it is anticipated that all construction sites will be reinstated and restored. Reinstatement would form part of the contract obligations for the Principal Contractor and would include the removal of all temporary access tracks, all work sites around the tower locations and the re-vegetation of all construction compounds.

2.9 Construction Employment and Hours of Work

2.9.1 The Applicant takes community responsibilities seriously. The delivery of a major programme of capital investment provides the opportunity to maximise support of local communities.

2.9.2 Employment of construction staff will be the responsibility of the Principal Contractor but the Applicant encourages the Principal Contractor to make use of suitable labour and resources from areas local to the location of the works.

2.9.3 It is envisaged that there will be a number of separate teams working at the same time at different locations within the Proposed Development corridor. The resource levels will be dependent on the final construction sequence and will be determined by the Principal Contractor.

2.9.4 Construction working is likely to be during daytime periods only. Working hours are currently anticipated between approximately 07.00 to 19.00 during British Summer Time (BST) and 07.00 to 18.00 during Greenwich Mean Time (GMT), seven days a week. Special measures and arrangements would be made for works in proximity to sensitive receptors. Working hour assumptions would be set out within the EIA Report and confirmed with THC as the respective local authority.

2.10 Construction Traffic

2.10.1 Construction of the Proposed Development will give rise to regular numbers of staff transport movements, with small work crews travelling to work site areas. It is anticipated that the Principal Contractor will identify a single main compound area, with a safe area for parking away from the public highway.

2.10.2 Vehicle movements will be required to construct new or upgraded access roads; deliver towers and conductor materials to site; and deliver and collect materials and construction plant from the main site compound and to individual tower locations (as listed in **Section 2.8**).

2.10.3 Where practicable helicopters may be utilised for delivery of construction materials, so as to minimise potential impacts upon soils and the landscape from conventional traffic. The sourcing and implementation of helicopters for this purpose would be defined by the Principal Contractor.

2.10.4 The EIA Report will provide a summary of the total anticipated traffic movements associated with construction of the Proposed Development, broken down by phases. A Traffic Management Plan will also be developed, as discussed in **Chapter 12: Traffic and Transport**.

2.11 Operation and Management of the OHL

Life of the Proposed Development

2.11.1 In general, given the nature of the Proposed Development, there would be a negligible or no demand for energy, materials or natural resources during the operational life of the OHL. Whilst OHLs in general require very little maintenance, regular inspections are undertaken to identify any unacceptable deterioration of components so that they can be replaced. From time to time, inclement weather, storms or lightning can cause damage to either the insulators or the conductors. If conductors are damaged, short sections may have to be replaced. Insulators and conductors are normally replaced after about 40 years. Steel towers may require occasional treatment with preservatives to prevent decay.

Managed Operational Wayleave

2.11.2 In addition to the removal of vegetation to facilitate construction, it would be necessary to manage all vegetation along either side of the OHL throughout operation, to maintain required safety clearance distances. The vegetation clearance required will be dependent on the height of the vegetation adjacent to the OHL and on the surrounding topography. Vegetation clearance may be required where the vegetation height has the potential to impede the operational corridor or the topography is steeply sloping.

Residues and Emissions

2.11.3 **Table 2.1** provides a summary of the anticipated residues and emissions for the purpose of informing the scope of the EIA.

Table 2.1 Residues and Emissions

Topic	Potential residue/emission
Water	Construction: Surface water runoff and discharge is likely during construction. Pollution sources may arise as a result of soil erosion or from oil/ fuel or chemical storage and use. Operation: No water emissions or pollution sources have been identified for the operational phase.
Air	Construction: The construction phase would require the transport of people and materials by road and air, with associated emissions to the atmosphere. There are no air quality management areas within the vicinity of the Proposed Development. No significant air emissions are anticipated.

Topic	Potential residue/emission
	Operation: Due to the nature of the Proposed Development no significant point source or diffuse air emissions would be produced during its operation. The Proposed Development would contribute to connecting renewable electricity generation capacity to the transmission network, in turn displacing emissions associated with fossil fuel-based electricity generation elsewhere.
Soil and subsoil	Construction: Soil and subsoil excavation, handling and storage would be required during construction. All soil and subsoil would be stored temporarily for use in reinstatement. Operation: No requirement for soil or subsoil excavation or handling during the operation phase has been identified. No pollution sources have been identified for the operational phase.
Noise and Vibration	Construction: Possible effects associated with construction and operation of the Proposed Development include: • noise during the construction phase; and, • noise due to construction traffic. Operation: Operational effects of noise from the OHL.
Light	Construction: The temporary construction compounds are likely to be equipped with passive infra-red sensor controlled security lighting and lighting installations for use during low light conditions. Any effect would be temporary and is not expected to be significant. Operation: No light sources have been identified for normal operation of the proposed development.
Heat, Radiation and Electric and Magnetic Fields (EMF)	Construction: No heat or radiation sources have been identified for the construction phase. There will be no significant EMFs generated during construction. Operation: EMFs are emitted from the operation of OHLs as electricity is transmitted through the conductors. The potential effects on human health of EMFs are considered further in **Chapter 16: Other Issues Scoped Out of EIA.**
Waste	Construction: The construction stage will require felling of woodland. As such, it is anticipated that forestry related residues (brash) would result from the felling operations. It would be intended to use the non-marketable forest residues to enhance the soil and support the establishment of woodland. This will be managed through the CEMP. Operation: Limited waste may arise from operation and maintenance in the form of brash from vegetation maintenance or due to the replacement of faulty / damaged equipment e.g., conductor sections. All waste will be disposed of at the time it arises and in line with current legislation and best practice.

2.12 Decommissioning of the Proposed Development

2.12.1 The Applicant is seeking planning permission for the Proposed Development in perpetuity. As such, no separate assessment of decommissioning will be presented in the EIA report as it is a permanent facility.

3. EIA APPROACH AND METHODOLOGY

3.1 Introduction

3.1.1 The EIA report will be prepared in accordance with the EIA Regulations and informed by current best practice guidance as outlined in **Chapters 6 to 15**.

3.1.2 In line with Schedule 4 of the EIA regulations, the EIA Report will include introductory chapters to provide:

- a description of the Proposed Development comprising information on the location of the OHL; its physical characteristics, including the conductor selection, voltage and tower suite, and the area of land required during construction and operational phases; the main characteristics of the operational phase of the development; and the type and quantity of expected residues and emissions produced during the construction and operation phases; and
- a description of reasonable alternatives studied in terms of the OHL alignment selection and technology (conductor selection, voltage, tower suite) and the main reasons for the chosen option, including a comparison of the environmental effects, highlighting how the Proposed Development delivers 'mitigation by design'.

3.1.3 A detailed overview of the guidance and methodology adopted for each technical study is provided within the respective technical chapters of this EIA Scoping Report (**Chapters 6 to 15**).

3.2 Identification Of Baseline

3.2.1 The existing baseline environmental conditions need to be established as a basis for identifying the scale of likely significant effects as a result of the Proposed Development.

3.2.2 The baseline scenario will be established through one or more of the following methods:

- Site visits and surveys (including one year of vantage point bird surveys);
- Desk-based studies;
- Review of existing information;
- Modelling;
- Review of relevant national and local planning policies;
- Consultation with the relevant statutory consultees; and
- Identification of Sensitive Receptors.

3.2.3 Consistent with Schedule 4 of the EIA Regulations, the aspects of the environment likely to be significantly affected by the Proposed Development have been identified to inform this EIA Scoping Report. In particular, this focused on the potential impacts upon population, fauna, flora, soil and material assets including the architectural and archaeological aspects, and landscape, and the inter-relationship between those factors.

3.3 Assessment of Likely Significant Environmental Effects

3.3.1 For the purposes of this EIA Scoping Report the terms used in the assessment of effects are generally defined as follows:

- 'Impact' is specific and defined as the action being taken, for example, cutting down trees.
- 'Effect' is defined as the change resulting from that action.

3.3.2 Where a more appropriate effect duration scale or definition of the above terms is applicable to a technical discipline this will clearly outlined within the technical chapters.

3.3.3 When identifying likely significant effects, all types of effect, such as beneficial and adverse, will be included. As stated in Institute of Environmental Management and Assessment (IEMA) 'Guidelines

for Landscape and Visual Impact Assessment 3 (GLVIA3), *'identifying significant effects stresses the need for an approach that is in proportion to the scale of the project that is being assessed and the nature of its likely effects. Judgement needs to be exercised at all stages in terms of the scale of the investigation that is appropriate and proportional.'*

3.3.4 The result of the assessment is the determination of whether the likely effect of the Proposed Development on the receptor in the study area would be significant or not significant, and adverse or beneficial.

3.3.5 Several criteria will be used to determine whether or not the likely environmental effects of the Proposed Development will be deemed 'significant'. The effects will be assessed quantitatively where possible. Generally, the significance of effects will be assessed using one of more of the following criteria:

- International, national and local standards;
- Sensitivity of receiving environment;
- Extent and magnitude of the effect; and
- Reversibility and duration of the effect.

3.3.6 Where no published standards exist, the assessments presented in the technical chapters will describe the professional judgements (assumptions and value systems) that underpin the attribution of significance. For certain technical topics, such as ecology, widely recognised published significance criteria and associated terminology have been applied and these are presented in the technical chapters and associated appendices where relevant.

3.3.7 The assessment of significance will consider the magnitude of change (from the baseline conditions), the sensitivity of the affected environment / receptors and (in terms of determining residual effects) the extent to which mitigation and enhancement will reduce or reverse adverse effects. In addition, further influences such as those listed below will be factored into the assessment using professional judgement:

- Likelihood of occurrence;
- Geographical extent;
- The value of the affected resource;
- Adherence of the proposals to legislation and planning policy; and
- Reversibility and duration of the effect.

3.3.8 The magnitude (scale) of change for each effect will be identified and predicted as a deviation from the established baseline conditions, for the construction and operational phases of the Proposed Development.

3.3.9 The sensitivity of the receptor / receiving environment to change will be determined using professional judgement, consideration of existing designations (such as Sites of Special Scientific Interest (SSSIs)) and quantifiable data, where possible.

3.3.10 Each effect will be assessed taking account of the predicted magnitude of change and the sensitivity of the receptor as shown in **Table 3.1** below to determine an overall significance.

Table 3.1: Matrix for Determining the Significance of Effects

Magnitude of Change/Impact	Sensitivity of Receptor/Receiving Environment			
	High	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Negligible
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

3.3.11 Major and moderate effects are considered to be significant in the context of the EIA Regulations. Minor and negligible effects are not considered significant.

3.3.12 Specific criteria have been adopted for certain technical assessments in accordance with widely recognised EIA guidelines published by professional bodies (such as for landscape and visual impact assessment and the assessment of ecological effects). This guidance will be identified in the respective technical chapters, where applicable.

3.3.13 The characteristics of an effect will vary depending on the duration of the activity causing the effect, the sensitivity of the receptor and the resultant change. It is therefore necessary to assess whether the effect is temporary or permanent and beneficial or adverse. Effects that are temporary are usually reversible and generally confined to the construction period.

3.4 Consideration of Alternatives

3.4.1 The Proposed Development has been subject to a route selection process, informed by The Applicant's procedures for routeing overhead lines, which provide a framework for ensuring environmental, technical and economic considerations are identified and appraised at each stage of the routeing process.

3.4.2 The guidance splits the routeing stage of a project into four principal stages, as follows:

- Stage 0: Routeing Strategy Development;
- Stage 1: Corridor Selection;
- Stage 2: Route Selection; and
- Stage 3: Alignment Selection.

3.4.3 Each stage is an iterative process and involves an increasing level of detail and resolution, bringing cost, technical and environmental considerations together in a way which seeks to achieve the best balance at each stage. The process is iterative and can vary depending on the type, nature of and size of a project. Consultation is carried out at each stage of the process.

3.4.4 The routeing process has been documented as follows:

- SSEN Transmission, (August 2023) Spittal – Loch Buidhe – Beauly 400 kV Connection Consultation Document
- SSEN Transmission, (December 2023) Spittal – Loch Buidhe – Beauly 400 kV Connection Report on Consultation
- SSEN Transmission, (March 2024) Spittal – Loch Buidhe – Beauly 400 kV Connection Consultation Document Addendum

3.4.5 A summary of the reasonable alternatives studied by the Applicant (having regard to the factors identified within Schedules 4, para. 2, of the EIA Regulations) will be set out within the EIA Report, including the alternative technologies considered during the route selection process.

3.5 Mitigation

3.5.1 The Proposed Development design is an iterative process integrating electrical and civil engineering and environmental considerations. The design process has sought to reduce the potential for significant environmental effects at the outset taking account of environmental and technical information.

3.5.2 The process of mitigating impacts through design is referred to in this Scoping Report and will be referred to in the EIAR as 'Embedded Mitigation' and is the first of three levels of EIA mitigation which is applied to the EIA process, the second and third being, respectively:

- Applied Mitigation: The adoption of good practice measures and procedures relating to construction environmental management which are well understood with a high degree of confidence they would be implemented and effective.
- Additional Mitigation: Further bespoke measures required to mitigate likely residual (i.e. after the application of other mitigation) significant effects and which are identified through the EIA process.

3.5.3 In this Scoping Report, further reference to aspects of the design which has formed key Embedded Mitigation is set out briefly in the topic-based chapters to provide a context for the subsequent discussions on the potential effects of the Proposed Development.

3.5.4 In relation to Applied Mitigation, SSEN Transmission has adopted a CEMP template and a suite of GEMPs and SPPs which will be implemented as appropriate by the Proposed Development and will be incorporated into the EIA process and presented in the EIAR. In addition, the Applicant will require, as a condition of the Principal Contract, that the Contractor develops detailed Management Plans which conform to the approach and content of the CEMP, GEMPs and SPPs, and which will incorporate any Additional Mitigation arising out of the EIA process. It is assumed that these Plans will also be required as consent conditions and will be reviewed and approved by the consenting body as part of condition discharge. The content and effective implementation of the Plans by the Contractor during construction will also be assured by an audit process, the implementation of which is also assumed to be a consent condition. The EIA will identify and assess potentially significant effects taking account of the Embedded and Applied Mitigation.

3.5.5 The focus of the EIA therefore will be to identify, predict and evaluate, on a discipline-by-discipline basis, the significance of any residual environmental effects remaining after the application of Embedded and Applied Mitigation, and to identify any Additional Mitigation which may be required to avoid or reduce the scale and significance of predicted residual effects to the extent possible. Where Additional Mitigation measures are required, these will be identified clearly within the relevant chapters of the EIAR and in a Schedule of Mitigation which will collate all mitigation commitments in a single chapter. Where there are opportunities for offsetting and/or positive and enhancing effects, these will be identified through the EIA process. It is acknowledged that these are not part of EIA mitigation and any proposals for compensation and enhancement as part of the planning application would be clearly and separately identified from mitigation measures.

3.5.6 In addition, a key part of SSEN Transmission's Sustainability Strategy is to achieve Biodiversity Net Gain (BNG) as part of the delivery of each project. This is discussed further in **Section 1.3** and in **Chapter 7: Ecology and Nature Conservation**.

3.6 Cumulative Effects

3.6.1 There are two aspects to cumulative effects, defined as follows:

- In-combination effects: The combined effect of the Proposed Development together with other reasonably foreseeable developments (taking into consideration effects at the site preparation and earthworks, construction and operational phases); and
- Effects Interactions: The combined or synergistic effects caused by the combination of a number of effects on a particular receptor (taking into consideration effects at the site preparation and earthworks, construction and operational phases), which may collectively cause a more significant effect than would occur individually. A theoretical example is the culmination of disturbance from dust, noise, vibration, artificial light, human presence and visual intrusion on sensitive fauna (e.g., certain bat species) adjacent to a construction site.

3.6.2 These aspects will be considered in relation to:

- the combination of the Proposed Development and other SSEN Transmission ASTI associated developments – referred to as 'intra-project' effects; and

- the combination of the Proposed Development and third party projects – referred to as 'inter-project' effects.

3.6.3 The potential for cumulative effects will be considered in relation to other EIA development, for which an application has been submitted or approved, within the study area relevant to each particular topic. The basis for this is that these are the developments that have the potential to result in significant cumulative environmental effects in combination with those arising from the Proposed Development. Exceptions to this rule are other developments proposed by the Applicant that are not yet the subject of an application or consent but are foreseeable to the Applicant and relevant to this EIA. These include the substations at Spittal, Loch Buidhe and Beauly.

3.6.4 The list of developments to be considered for both 'intra-project effects' and 'inter-project effects' are described in **Table 3.2** and **Table 3.3**. Projects for inclusion in the inter project cumulative assessment will be finalised four months prior to publication to allow sufficient time to complete the EIA Report.

Table 3.2: List of Projects considered for 'intra-project' effects

Project	Description	Status
Carnaig 400kV Substation	Proposed substation.	Scoping Opinion Issued
Banniskirk 400kV Substation	Proposed substation.	Scoping Opinion Issued
Fanellan 400kV Substation	Proposed substation.	Scoping Opinion Issued
Beauly to Blackhillock to New Deer to Peterhead 400kV OHL	Proposed 400 kV overhead line from proposed Fanellan substation to Peterhead.	Scoping Opinion Issued

Table 3.3: List of Projects considered for 'inter-project' effects

Project	Description	Status
West of Orkney WF Grid Connection	Construction of onshore transmission infrastructure comprising up to two cable landfalls, an onshore substation and up to five associated export circuits	Application Permitted
Watten WF	Erection and operation of a wind farm for a period of 35 years, comprising of 7 wind turbines with a maximum blade tip height of 220m, access tracks, borrow pits, substation, control building, battery storage and ancillary infrastructure.	Under Consideration
Abhainn Dubh WF	Erection and operation of a wind farm for a period of 30 years, comprising of 13 wind turbines with a maximum blade tip height of 149.9m, energy storage facility, access tracks, borrow pits, substation, anemometer mast, control building, and ancillary infrastructure.	Under Consideration
Toftingall Wind BESS	Erection and operation of a battery energy storage system with a maximum output of 49.9MW including switchgear and control buildings, landscaping, fencing and ancillary infrastructure.	Under Consideration
Mybster BESS	Construction and operation of Battery Energy Storage System (BESS) of up to 150MW comprising a compound of battery and electrical equipment, access track, landscaping and ancillary works.	Under Consideration
Goticlay WF Redesign	Erection and operation of a wind farm for a period of 35 years, comprising up to 13 wind turbines, 11 with a maximum blade tip height of 200m, 2 with a maximum blade tip height of 180m, access tracks, borrow pits, substation, control building, metrological mast, and ancillary infrastructure.	Awaiting decision

Project	Description	Status
Acheilidh Wind Farm (fka Lairg III)	Erection and operation of a wind farm for a period of 35 years, comprising of 12 wind turbines with a maximum blade tip height of between 200m and 230m, battery energy storage system (BESS), access tracks, borrow pits, substation, control building, and ancillary infrastructure.	Under Consideration
Tormsdale WF	Erection and operation of wind farm for period of 30 years, comprising of 10 wind turbines with maximum blade tip height of 149.9m, access tracks, substation, control building, Battery Energy Storage System, and ancillary infrastructure.	Under Consideration
Lairg II WF Redesign	Erection and Operation of a Wind Farm for a period of 35 years, comprising of 5 No. Wind Turbines with a maximum blade tip height of 200m, 2 No. Wind Turbines with a maximum blade tip height of 190m, 3 No. Wind Turbines with a maximum blade tip height of 150m, access tracks, borrow pits, 132kV substation, control building, energy storage compound and ancillary infrastructure.	Application Permitted
Strathrory WF Redesign	Erection And Operation Of A Wind Farm For A Period Of 35 Years, Comprising A Total Of 7 Wind Turbines With Turbines 1,2,3 And 5 Having A Maximum Blade Tip Height Of 180M, Turbine 4 Having A Maximum Blade Tip Height Of 160M, And Turbines 6 And 7 Having A Maximum Blade Tip Height Of 149.9M, Battery Energy Storage System, Access Tracks, Borrow Pit, Substation, Control Building, And Ancillary Infrastructure	Appeal Allowed
Camster II Wind Farm	Erection of up to 11 wind turbines maximum tip height of 126.5m with associated infrastructure	Appeal Allowed
Achany Extension WF	Erection and Operation of a Wind Farm for a period of 50 years, comprising of 20 Wind Turbines with a maximum blade tip height 149.9m, access tracks, borrow pits, substation, control building, and ancillary infrastructure	Approved by Scottish Ministers
Cairnmore Hill WF (Re-design)	Erection and Operation of a Wind Farm for a period of 35 years, comprising of 5 Wind Turbines with a maximum blade tip height 138.5m, access tracks, substation, control building, battery energy storage system, and ancillary infrastructure.	Under Consideration
Chleansaid WF	Erection and Operation of a Wind Farm comprising 16 turbines 12 turbines at 200 metres and 4 turbines at 180 metres, generating around 96MW and associated infrastructure (access tracks, borrow pits, substation, control building) and includes battery energy storage facility 20MW	Approved by Scottish Ministers
Meall Buidhe WF	Erection of and Operation of a Wind Farm for a period of 25 years comprising of 8 Wind Turbines access tracks, substation, control building, and ancillary infrastructure with a maximum output of 40 Megawatts.	Appeal Allowed
Slickly WF	11 wind turbines up to 149.9m blade tip height and associated infrastructure	Appeal Allowed
Strath Tirry WF	Erection and Operation of a Wind Farm for a period of 30 years, comprising of 4 Wind Turbines with a maximum blade tip height of 135m, access tracks, borrow pits, substation, control building, meteorological mast and ancillary infrastructure.	Application Permitted
Bingally 400kV Substation	400 Kv Substation Comprising New Buildings, Platform, Plant And Machinery, Access, Laydown/Work Compound Area(S), Drainage, Landscaping, And Other Ancillary Works (National Development)	Under Consideration
Loch Liath WF	Erection and operation of a wind farm for a period of 35 years, comprising a total of 13 wind turbines with Turbines 2, 3, 4, 5, 8, 9, 10, 11, 12, and 13 having a maximum blade tip height of 200m, and Turbines 1, 6 and 7 having a maximum blade tip height of 180m, access tracks, borrow pit, substation, control building, anemometer mast, and ancillary infrastructure.	Under Consideration

Project	Description	Status
Baledigle WF	EIA Scoping request for the erection and operation of a wind farm comprising up to 13 wind turbines with a capacity of up to 91MW and a tip height of up to 250m, Battery Energy Storage System (BESS) of up to 45MW and ancillary infrastructure	Under Consideration
Sallachy WF	Erection and Operation of a Wind Farm for a period of 30 years, comprising of 9 Wind Turbines with a maximum blade tip height of 149.9m, access tracks, temporary borrow pits and construction compound, substation compound, and ancillary infrastructure.	Application Permitted
Bhlaraidh WF extension	Erection and Operation of Wind Farm for period of 50 years, comprising of 15 Wind Turbines with maximum blade tip height 180m, access tracks, borrow pits, substation, control building, and ancillary infrastructure	Approved by Scottish Ministers
Lynemore WF	Erection and operation of a wind farm comprising up to 10 wind turbines with a maximum blade tip height of 200m, battery energy storage facility and ancillary infrastructure	Under Consideration

3.7 Habitats Regulation Appraisal

3.7.1 The Proposed Development passes through, and within close proximity of, a number of European designated sites.

3.7.2 The Proposed Development is not directly connected with or necessary to any European site's management for nature conservation. Therefore, the Proposed Development will, under the Conservation (Natural Habitats, &c.) Regulations 1994[13] (hereafter 'the Habitats Regulations') require to undergo a screening for likely significant effects on the European sites. This screening is the first stage of a Habitats Regulations Appraisal (HRA) that is required to be carried out by the competent authority upon submission of a consent application. To inform the competent authority's HRA, a shadow HRA will be provided alongside the EIA Report.

3.7.3 The HRA will follow relevant guidance from NatureScot and EC (European Commission) Guidance on Managing Natura 2000 sites[14], together with EC Methodological Guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC which sets out the HRA procedure. The HRA procedures set out by the EC still apply in Scotland after the UK's exit from the European Union, following 2019 amendments to the Habitats Regulations.

3.8 Structure of the EIA Report

3.8.1 Given the scale of the Proposed Development, it is proposed to structure the EIA Report in a manner which provides the reader with the opportunity to easily focus on a particular area of interest. As such, it is anticipated that the EIA Report will be structured as follows:

- Volume 1 - A Non-Technical Summary: summarising the Proposed Development and its likely significant effects.
- Volume 2 – An Overview of the Proposed Development / EIA Report and Technical Chapters: this volume will provide an introduction to the EIA Report, a description of the Proposed Development, the alternatives considered, the EIA process, the approach taken to consultation and a summary of the likely significant environment effects across the project as a whole. This volume will also include one chapter for each EIA topic scoped into the assessment. Each chapter will describe the baseline environment, potential effects, mitigation and likely significant

[13] The UK Government (1994). Conservation (Natural Habitats, &c.) Regulations 199. Available at: https://www.legislation.gov.uk/uksi/1994/2716/contents/made

[14] NatureScot and EC (European Commission). Managing and protecting Natura 2000 sites. Available at: https://environment.ec.europa.eu/topics/nature-and-biodiversity/natura-2000/managing-and-protecting-natura-2000-sites_en

environmental effects for the respective topic. Information to help sign-post the respective local planning authority areas will be included where appropriate.

- Volume 3 – Figures: this volume would provide supporting figures to the assessments carried out as part of Volume 2.
- Volume 4 – Visualisations: this volume would provide visualisations of the Proposed Development from agreed viewpoint locations.
- Volume 5 – Appendices: this volume would include supporting appendices to the assessments carried out as part of Volume 2, and other information such as scoping and consultation responses, and assessment methodologies.

3.9 Assumptions and Limitations

3.9.1 The key assumptions and limitations relevant to the preparation of this EIA Scoping Report are set out below. Assumptions and limitations specific to certain topics are identified in the appropriate technical chapter.

- Baseline conditions have been established from a variety of sources, including historical data, but due to the dynamic nature of certain aspects of the environment, conditions will change during the construction and operation of the scheme.
- Information received by third parties is complete and up to date.
- Construction methods have been assumed based on similar projects that SSEN Transmission have undertaken. However, specific methods will not be determined until appointment of the Principal Contractor.

4. SUMMARY OF SECTIONS

4.1 Introduction

4.1.1 This chapter provides a summary of each of the five sections of the Proposed Development.

4.2 Section A: Spittal to Brora

4.2.1 This section of the Proposed Development originates at the proposed new Spittal area Substation (Banniskirk), following a southerly direction west of Dunbeath, Berriedale and Helmsdale before continuing south-west to north of Brora (see **Appendix A**, **Figure 4.1**).

4.2.2 Constraints between Spittal and Brora include local settlements such as Dunbeath and Helmsdale, alongside the Spittal Hill Wind Farm and a number of other proposed wind farms. In addition, there are numerous designated sites including Special Areas of Conservation (SACs), Special Protected Areas (SPAs) and SSSIs, as well as the RSPB reserve, Causeymire – Knockfin Flows Wild Land Area (WLA) and the Ben Klibreck – Armine Forest WLA. The peatlands in the area form part of the Flow Country (an intact and expansive blanket bog system that stretches across Caithness and Sutherland). The Flow Country was inscribed on the World Heritage List to the United Nations Educational, Scientific and Cultural Organisation (UNESCO) as of July 2024.

4.2.3 The terrain in the area is mix of moderate hills with some steep slopes, and areas with more gradual undulating terrain.

4.3 Section B: Brora to Loch Buidhe

4.3.1 This section of the Proposed Development originates north of Brora, heading generally south-west towards Loch Buidhe Substation and the proposed new Loch Buidhe area Substation (Carnaig) (see **Appendix A**, **Figure 4.2**).

4.3.2 Constraints between Bora and Loch Buidhe include the Strath Carnaig and Strath Fleet Moors SPA and SSSI which extends from the west of Golspie to Loch Buidhe; the Dornoch Firth and Loch Fleet Ramsar site and SPA to the south of Golspie; Mound Alderwoods SAC and SSSI; and Strathfleet SSSI.

4.3.3 The terrain in this section has a mix of high hills and steep slopes. There are a number of wind farms to avoid, including the constructed Kilbraur wind farm and the consented Kilbraur extension.

4.4 Section C: West of Dornoch

4.4.1 This section of the Proposed Development originates at Loch Buidhe Substation (Carnaig) heading generally south-west towards the west of Bonar Bridge (see **Appendix A**, **Figure 4.3**).

4.4.2 Proximity to local properties around the areas of Bonar Bridge, Culrain, Carbisdale, Drumaliah, Dounie and Tulloch were noted as constraints in this section. Other constraints include a number of natural heritage designations such as the Dornoch Firth National Scenic Area (NSA); Strath Carnaig and Strath Fleet Moors SPA and SSSI; the River Oykel SAC; and Kyle of Sutherland Marshes SSSI. There are also a number of scheduled monuments and listed buildings, including the Battle of Carbisdale Registered Battlefield, and areas of ancient woodland.

4.5 Section D: Dornoch to Dingwall

4.5.1 This section of the Proposed Development originates west of Bonar Bridge following a southerly direction towards Dingwall before continuing to the west of Strathpeffer (see **Appendix A**, **Figure 4.4**).

4.5.2 Local settlements including Ardross, Alness, Dingwall, Evanton, Contin, Tarvie, Garve and Strathpeffer are key constraints in this section. Other constraints include: commercial forestry areas and areas of ancient woodland; the Novar SPA; the Amat Wood SAC and SSSI; Category A listed

buildings such as Ardross Castle; the Ardross Castle Garden and Designed Landscape (GDL); and the Rhiddoroch - Beinn Dearg - Ben Wyvis Wild Land Area (WLA). There are a number of existing OHLs within this section and the terrain varies with large sections comprising very challenging hilly terrain.

4.6 Section E: Dingwall to Beauly

4.6.1 This section of the Proposed Development originates south of Strathpeffer following a southerly direction to the proposed new Beauly area Substation (Fanellan) (see **Appendix A**, **Figure 4.5**). There is also an alternative route option that travels south-west from Strathpeffer and then south-east from Tarvie.

4.6.2 Constraints in this section include areas of ancient woodland; the Fairburn GDL and Category A listed Fairburn Tower; Conon Islands SAC; Lower River Conon SSSI; and the Brahan GDL. There are a number of existing OHLs in the area. Proximity to properties in this area, such as at Marybank, was also a key consideration.

5. PLANNING POLICY

5.1 Introduction

5.1.1 This chapter provides an overview of the planning policy context for the Proposed Development. A more detailed discussion and evaluation of relevant policies will be included within the Planning Statement that will be provided as a supporting document with the application for consent. An up-to-date list of relevant planning policies will be contained within the EIA Report for context as this is not a topic for assessment in the EIA.

5.2 National Planning Policy

National Planning Framework 4

5.2.1 NPF provides a framework for long-term spatial development in Scotland. The fourth National Policy Framework (NPF4)[15] was adopted by the Scottish Ministers on 13 February 2023, following approval by the Scottish Parliament in January[16]. It sets out how planning and development will help Scotland to achieve a 'net zero, sustainable Scotland by 2045.' It confirms the necessary shift required to achieve net zero-emissions by 2045. It will also 'play a critical role in supporting nature restoration and recovery' and will be followed by a Scottish biodiversity strategy which will set targets for 2030.

5.2.2 NPF4 confirms that a concerted effort to work together with communities will be required so that the transition to net zero and nature recovery is fair to all. One of the four key actions identified for Scotland's north and west islands and coastal communities is to *Strengthen Resilience and Decarbonise Connectivity* by improving grid connections. This will actively facilitate decarbonised heating and electricity generation and distribution.

5.2.3 Moreover, the NPF4 identifies the need for a significant increase in electricity generation from renewable sources to meet the net zero emissions targets and that the electricity transmission grid will need substantial reinforcement and additional infrastructure to achieve this. Developments that fall within one or more of the following categories will be designated as National Development:

- "Electricity generation, including electricity storage, from renewables of or exceeding 50 megawatts capacity;
- New and/or replacement high voltage electricity lines and interconnectors of 132 kV or more; and
- New and/or upgraded infrastructure directly supporting high voltage electricity lines and interconnectors including converter stations, switching stations and substations."

5.2.4 NPF4 identifies 18 National Developments described as: "*significant developments of national importance that will help to deliver the spatial strategy*". Developments proposed as National Developments are acknowledged as projects expected to provide substantive support to the economy of Scotland in terms of direct and indirect employment and business investment, with wider economic benefits. It adds that: "Their designation means that the principle for development does not need to be agreed in later consenting processes, providing more certainty for communities, businesses and investors".

5.2.5 The Proposed Development is a National Development under NPF4. The Proposed Development falls within the category of National Development 3 (ND3) "Strategic Renewable Electricity Generation and Transmission Infrastructure…support renewable electricity generation, repowering, and expansion of the electricity grid. The location for ND3 is set out as being all of Scotland and in terms of need it is described as: "*Additional electricity generation from renewables and electricity*

[15] Scottish Government (2023) National Planning Framework 4. Available at: https://www.gov.scot/publications/national-planning-framework-4/
[16] Scottish Government (Updated August 2022). The Highland Wide Local Development Plan. Available at: https://www.gov.scot/publications/local-development-plan-highland/

transmission capacity of scale is fundamental to achieving a net zero economy and supports improved network resilience in rural and island areas."

5.2.6 The designation and classes of development which would qualify as ND3, are: "A development contributing to 'Strategic Renewable Electricity Generation and Transmission' [in the location described], within one or more of the Classes of Development described below and that is of a scale or type that would otherwise have been classified as 'major' by 'The Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009', is designated a national development: (a) on and off shore electricity generation, including electricity storage, from renewables exceeding 50 megawatts capacity; **(b) new and/or replacement upgraded on and offshore high voltage electricity transmission lines, cables and interconnectors of 132kV or more** (emphasis added); and (c) new and/or upgraded Infrastructure directly supporting on and offshore high voltage electricity lines, cables and interconnectors including converter stations, switching stations and substations.

5.2.7 The Proposed Development falls within the category of development described in ND3 in part (b).

5.3 Local Planning Policy

5.3.1 The Proposed Development would be considered against the following Local Development Plan documents.

Highland-wide Local Development Plan

5.3.2 The Highland Wide Local Development Plan (HwLDP) 2012[17] provides the local planning framework for the area and provides the general policy context against which the Proposed Development would be assessed. Development of the revised plan is ongoing and will be in line with NPF4.

5.3.3 Policy 69 is the policy of most relevance to the Proposed Development given that it is specific to electricity transmission infrastructure. The policy acknowledges the significance and importance of proposals for electricity transmission infrastructure and provides support for proposals which are assessed as not having an unacceptable significant impact on the environment, taking into consideration mitigation measures.

5.3.4 Other relevant policies from the HwLDP are listed in **Table 5.1.**

Table 5.1: List of Relevant HwLDP Policies

Policy Reference	Name
Policy 28	Sustainable Design
Policy 29	Design Quality and Place-Making
Policy 30	Physical Constraints
Policy 36	Development in the Wider Countryside
Policy 51	Trees and Development
Policy 52	Principle of Development in Woodland
Policy 53	Minerals
Policy 55	Peat and Soils
Policy 56	Travel
Policy 57	Natural, Built and Cultural Heritage
Policy 58	Protected Species
Policy 59	Other Important Species

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

Policy Reference	Name
Policy 60	Other Important Habitats and Article 10 Features
Policy 61	Landscape
Policy 62	Geodiversity
Policy 63	Water Environment
Policy 64	Flood Risk
Policy 69	Electrical Transmission Infrastructure
Policy 72	Pollution
Policy 77	Public Access
Policy 78	Long Distance Routes

6. LANDSCAPE AND VISUAL AMENITY

6.1 Introduction

6.1.1 This chapter describes the proposed scope and approach to the assessment of potential direct and indirect effects resulting from the Proposed Development on landscape and visual amenity during construction and operation. Decommissioning has not been considered as the Proposed Development does not have a fixed operational life (as discussed in **Section 2.12**). The proposed scope and approach to the Landscape and Visual Impact Assessment (LVIA) have been developed on the premise that the Proposed Development will consist of the following as described in **Chapter 2: Description of the Proposed Development**:

- steel lattice towers would be 57 m above ground level in height on average, with a maximum extension height of up to 70 m; and
- tower spacings of approximately 350 m apart on average.

6.1.2 The chapter includes a brief description of the baseline conditions in each section of the Proposed Development. This includes a description of landscape character units and landscape designations through which the Proposed Development would cross and the identification of visual receptors in the vicinity of the Proposed Development that would likely experience views of the OHL.

6.1.3 The chapter also identifies:

- the likely significant effects that they may arise as a result of the Proposed Development;
- the approach and methodology to be used in the assessment; and
- mitigation to be considered in order to minimise or avoid significant adverse effects on landscape and visual amenity.

6.1.4 The chapter is supported by the data sets and mapping provided in the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[18]. This web map can be used to review and identify key landscape and visual receptors and resources that may be affected by the Proposed Development.

6.1.5 Landscape and visual amenity are separate but closely linked aspects. The assessment of effects on landscape receptors addresses the effects on the landscape as a resource in its own right. The assessment of effects on visual amenity addresses the effects on specific views and on the general visual amenity experienced by people.

6.2 The Proposed Development

6.2.1 The Proposed Development is described in detail in **Chapter 2: Description of the Proposed Development.** It will comprise the following components:

- Construction of approximately 85 km of new 400 kV double circuit OHL on steel lattice towers between the proposed new Spittal and Loch Buidhe 400 kV substations;
- Construction of approximately 82 km of new 400 kV double circuit OHL on steel lattice towers between the proposed new Loch Buidhe and Beauly 400 kV substations;
- Construction of temporary and permanent tracks to enable access to the OHL route;
- Rationalisation of existing high voltage and low voltage infrastructure at points of crossing along the new OHL routes, and around new and existing substation sites; and
- Ancillary development including: the formation of ‘bellmouths’; temporary and permanent construction access tracks and tower working areas; cable sealing end compounds; construction compounds; ‘borrow pits’; vegetation clearance and management; and other temporary measures required during construction.

[18] 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)

6.2.2 Underground cables could be required in association with the Proposed Development.

6.2.3 All components to the Proposed Development have the potential to result in effects on landscape and visual receptors. These effects will be reported within the LVIA. For the purposes of the EIA (and the LVIA) reporting the Proposed Development will be separated into the following five sections, from north to south:

- Section A – Spittal to Brora;
- Section B – Brora to Loch Buidhe;
- Section C – West of Dornoch;
- Section D – Dornoch to Dingwall; and
- Section E – Dingwall to Beauly.

6.3 Legislation and Policy

6.3.1 Planning policy relevant to the Proposed Development is described in **Chapter 5: Planning Policy** of this Scoping Report. Planning policies relevant to the landscape and visual assessment will be identified and discussed as part of LVIA reporting.

6.4 Study Area

6.4.1 For the purposes of this Scoping Report a 10 km-wide study area centred on the Proposed Development has been adopted. The extent of the study area has been informed by desk study and professional judgement and defined on the basis that beyond 10 km significant effects on landscape and visual receptors are unlikely to result from the Proposed Development.

6.4.2 As part of the preparation of the LVIA, the study area will be re-examined and agreed with key consultees as part of the consultation process following desk study, fieldwork, and the preparation of visibility mapping. Where appropriate, the study area may be reduced or extended in order to reflect the potential for significant adverse effects on landscape and visual receptors. Provisionally it is assumed that the LVIA study area will extend to 10 km from the Proposed Development.

6.5 Baseline Conditions

General

6.5.1 The Proposed Development will be sited within a baseline environment comprising a diverse range of landscapes and exhibiting a diverse range of visual receptors. This section identifies the baseline landscape character units and designated landscapes through which the Proposed Development will cross. The section also identifies visual receptors likely to experience a change in visual amenity resulting from the Proposed Development.

6.5.2 The extents of each section of the Proposed Development and the landscape and visual receptors which fall within the study area are illustrated in the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[19].

6.5.3 The identification of landscape character units and landscape designations has drawn from the published datasets prepared by NatureScot and THC, landscape character units comprising Landscape Character Types (LCTs) and landscape designations comprising: National Scenic Areas (NSAs); Special Landscape Areas (SLAs); and Wild Land Areas (WLAs) in addition to the Flow Country World Heritage Site (WHS).

Landscape Context

6.5.4 The Proposed Development crosses a range of landscapes along its length, from expansive open moorlands in the north to narrow coastal landscapes, rolling upland landscapes, and settled wooded

[19] 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)

straths and farmlands in the south. These landscapes exhibit different characteristics and levels of value which will be examined in the LVIA.

Landscape Character

6.5.5 The Proposed Development crosses a range of landscapes between Spittal, Loch Buidhe and Beauly. An assessment of the impacts on the character of the landscape will be undertaken as part of the LVIA drawing on NatureScot's Landscapes of Scotland database[20].

6.5.6 The LVIA will draw from the Landscapes of Scotland database and identify the defining features and key characteristics of relevant LCTs. The LCTs through which the Proposed Development will pass are listed in **Table 6.1** below. The assessment will subsequently provide an assessment of the potential impacts resulting from the Proposed Development as part of the assessment of effects on the landscape resource.

6.5.7 In addition to LCTs directly affected by the Proposed Development, the LVIA will identify and assess the nature of indirect impacts on LCTs which fall within the adopted study area, with a focus on those likely to be significantly and adversely impacted.

Table 6.1: Landscape Character Types

Landscape Character Type	Commentary	
LCT 143 Farmed Lowland Plain;	Section A crosses this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Farmed Lowland Plain LCT including the extensive views resulting from the openness of the landscape.
LCT 134 Sweeping Moorland and Flows;	Section A crosses this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Sweeping Moorland and Flows including impacts associated with an increase in infrastructure on the outer fringes of the LCT and impacts on local landmark hills.
LCT 144 Coastal Crofts & Small Farms.	Section A crosses this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Coastal Crofts & Small Farms LCT including those associated with an increase in infrastructure within this relatively narrow LCT.
LCT 135 Rounded Hills - Caithness & Sutherland;	Sections A, B and C cross this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Rounded Hills LCT including the increase in OHL with a landscape generally comprising broad rounded summits.
LCT 142 Strath - Caithness & Sutherland;	Sections A, B, C and D cross this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Strath LCT including those associated with the smaller scale of the LCT.
LCT 339 Inland Strath	Section D crosses this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Inland Strath LCT including those associated with the enclosed nature of the LCT.
LCT 330 Rounded Hills and Moorland Slopes - Ross & Cromarty	Section D crosses this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Rounded Hills and Moorland LCT resulting from an increase in infrastructure within this large scale landscape.
LCT Forest Edge Farming	Section D crosses this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Forest Edge Farming LCT including impacts on views that can be experienced from high ground across the surrounding landscapes.

[20] Scottish Landscape Character Types Map and Descriptions, NatureScot 2019 https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions

Landscape Character Type	Commentary	
LCT 329 Rounded Mountain Massif	Section D crosses this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Rounded Mountain Massif LCT including its largely wild, upland character.
LCT 335 Wooded Glens and Rocky Moorland	Section D crosses this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Wooded Glens and Rocky Moorland LCT including those associated with its scale and the nature of views.
LCT 345 Farmed and Forested Slopes - Ross & Cromarty	Section D crosses this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Farmed and Forested LCT including those associated with the pattern of development and landcover throughout the LCT.
LCT 331 Rounded Rocky Hills - Ross & Cromarty	Section D crosses this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Rounded Rocky Hills LCT resulting from an increase in transmissions lines and changes to views.
LCT 220 Rugged Massif - Inverness	Section D crosses this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Rugged Massif LCT including consideration of impacts on its sense of wildness.
LCT 227 Farmed Strath - Inverness	Section E crosses this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Farmed Strath LCT and the scale of the landscape.
LCT 229 Enclosed Farmland	Section E crosses this LCT	The LVIA will examine the potential impact of the Proposed Development on the key characteristics of the Enclosed Farmland LCT including impacts on the scale of the landscape.

6.6 Designated Landscapes

6.6.1 The LVIA will identify and assess the nature and extent of impacts on nationally and regionally designated landscapes within the study area. These designations will include:

- National Scenic Areas (defined as areas of outstanding scenic value in the national context);
- Wild Land Areas (nationally important areas exhibiting high wildness (but not a statutory designation)); and
- Special Landscape Areas (defined in the Highland Wide Local Development plan[21], Special Landscape Areas are regionally valuable landscapes identified to protect and enhance landscape qualities and promote their enjoyment).

6.6.2 The LVIA will also include consideration of impacts on the Flow Country World Heritage Site. The LVIA will not address impacts on inventoried Gardens and Designed Landscapes (GDLs) except where they are recognised as a popular visitor attraction and there is likely to be significant and adverse impacts on the views experienced by people at these locations. The assessment of impacts on GDLs, listed buildings and scheduled monuments and their setting resulting from the Proposed Development will be provided in **Chapter 9: Cultural Heritage**.

6.6.3 Designated landscapes within the study area are listed in **Table 6.2** below.

Table 6.2: Landscape Designations

Designation	Name	Commentary	
National Scenic Areas (NSAs)	Dornoch Firth NSA	The Proposed Development passes c.	While the Proposed Development will not directly impact the Dornoch Firth NSA it will potentially

[21] Highland Wide Local Development Plan, The Highland Council, 2012

Designation	Name	Commentary	
		3.9 km to the west of the Dornoch Firth NSA	impact its Special Qualities. The nature of these impacts will be examined as part of the LVIA.
	Glen Strathfarrar NSA	The Proposed Development passes c. 8.5 km to the north east of the Glen Strathfarrar NSA	The LVIA will examine the potential for indirect impacts on the Glen Strathfarrar NSA and confirm the extent and nature of predicted visibility of the Proposed Development and the potential for impacts on the NSAs Special Qualities.
Special Landscape Areas (SLAs)	The Flow Country and Berriedale Coast SLA	Section A crosses the Flow Country and Berriedale Coast SLA	The LVIA will examine the potential for impacts on the key landscape and visual characteristics and special qualities of the Flow Country and Berriedale Coast SLA including the Distinctive Mountain and Moorland Skylines and Exposed Peaks, Vast Openness and Intimate Glens.
	Loch Fleet, Loch Brora and Glen Loth SLA	Section A crosses the Loch Fleet, Loch Brora and Glen Loth SLA	The LVIA will examine the potential for impacts on the key landscape and visual characteristics and special qualities of the Loch Fleet, Loch Brora and Glen Loth SLA noting that additional large scale features could diminish the perceived scale of hills and their qualities of wildness and tranquillity.
	Fannichs, Beinn Dearg and Glencalvie SLA	Section D passes c. 6.8 km to the east of the Fannichs, Beinn Dearg and Glencalvie SLA	The LVIA will examine the potential for impacts on the key landscape and visual characteristics and special qualities of the Fannichs, Beinn Dearg and Glencalvie SLA.
	Ben Wyvis SLA	Section D passes c. 2.8 km to the south east of the Ben Wyvis SLA	The LVIA will examine the potential for impacts on the key landscape and visual characteristics and special qualities of the Ben Wyvis SLA
	Strathconon, Monar and Mullardoch SLA	Section D passes c.9.8 km to the north east of the Strathconon, Monar and Mullardoch SLA	The LVIA will examine the potential for impacts on the key landscape and visual characteristics and special qualities of the Strathconon, Monar and Mullardoch SLA.
	Loch Ness and Duntelchaig SLA	Section E terminates c. 10 km to the north west of the Loch Ness and Duntelchaig SLA	The LVIA will examine the potential for impacts on the key landscape and visual characteristics and special qualities of the Loch Ness and Duntelchaig SLA.
Wild Land Areas (WLAs)	Causeymire – Knockin Flows WLA	Section A crosses the Causeymire – Knockin Flows WLA	The LVIA will examine the potential for impacts on the WLA's key attributes including its ' awe inspiring simplicity of wide open peatland from which rise isolated, arresting, steep mountains'.
	Ben Klibreck – Armine Forest WLA	Sections A and B pass c. 6.8 km to the south of the Ben Klibreck – Armine Forest WLA	The LVIA will examine the potential for impacts on WLAs key attributes including its 'an awe-inspiring simplicity of landform and landcover and a perception of 'emptiness', so that the extent of the peatland often seems greater than it is' and 'an extensive area of peatland with a prevailing strong sense of naturalness'.
	Rhiddoroch - Beinn Dearg - Ben Wyvis WLA	Section D passes within 2.3km of the Rhiddoroch - Beinn Dearg - Ben Wyvis WLA	The LVIA will examine the potential for impacts on the WLAs key attributes including 'A range of awe-inspiring massive, high rounded hills and plateaux, as well as steep rocky peaks and ridges, offering elevated panoramas'.

Designation	Name	Commentary	
	Central Highlands WLA	Sections D and E pass c. 1.9 km to the north east of the Central Highlands WLA	The LVIA will examine the potential for impacts on the WLAs key attributes: including 'An extensive and awe-inspiring range of large scale, high and rugged mountains'.

6.7 Visual Amenity Receptors

6.7.1 The assessment of impacts on visual amenity will consider the changes to views and visual amenity experienced by people within the study area and focus on receptors likely to be significantly impacted by the Proposed Development. Potential visual receptors include people living, working and passing through the study area (via road, rail or other forms of transport), those engaged in recreational activities and those visiting promoted landscapes or attractions.

Residential Receptors

6.7.2 Potential residential receptors may include residents within the settlements of Halkirk, Spittal, Latheronwheel, Dunbeath, Berriedale, Helmsdale, Brora, Golspie, Bonar Bridge, Ardgay, Evanton, Dingwall, Strathpeffer, Contin, Marybank, Muir of Ord and Beauly.

6.7.3 Potential residential receptors will also include residents in smaller settlements and those in individual farmsteads and properties throughout the study area.

6.7.4 Residential receptors will be confirmed within the LVIA following the preparation of visibility mapping, further desk study and fieldwork.

Transport Receptors

6.7.5 Transport receptors will include users of the local and trunk road network in addition to those using the railway network. They may include users of the A9(T), the A882, the A897, the A839, the A836, the A834, the A832 and the A835(T). Transport receptors may also include users of the Far North Railway Line (Inverness to Thurso and Wick), and lines from Dingwall to Kyle of Lochalsh.

6.7.6 Transport receptors will be confirmed within the LVIA following the preparation of visibility mapping, further desk study and fieldwork.

Recreational Receptors

6.7.7 The study area encompasses a wide range of popular tourist and recreational attractions. These include:

- Users of the North Coast 500;
- Users of the Moray Firth Route;
- Users of the heritage and core path network;
- Users of the national Cycle Network (NCN) Route 1 / The Far North Way;
- Recreational users of Forestry and Land Scotland open access land within the study area; and
- Tourist attractions including historic monuments in addition to Gardens and Designed Landscapes (where they are popular visitor attractions open to the public).

6.7.8 Recreational receptors will also include people engaged in recreational activities within the study area such as hill walkers, cyclists, and users of lochs and watercourses.

6.7.9 Recreational receptors will be confirmed within the LVIA following the preparation of visibility mapping, further desk study and fieldwork.

6.8 Potential Impacts

Construction

6.8.1 Construction of the Proposed Development as a whole would take approximately three years and construction effects are generally considered to be short-term in nature. The likely landscape and visual impacts arising from construction are identified as being:

- Introduction of construction activity and vehicular/personnel movements along the OHL route and on local roads.
- Construction work associated with track upgrades and construction of temporary and new tracks.
- Construction of site compounds, as well as lighting of these when operational during hours of darkness.
- Construction of tower foundations and towers.
- Conductor stringing operations.
- The permanent introduction of tall vertical structures (steel lattice towers), connected by conductors.

6.8.2 Construction activities would generally not be undertaken during the night-time apart from specific short-term activities and as such specific night-time effects would not be considered within the LVIA.

Operation

6.8.3 The main effects resulting from the Proposed Development during its operational life would be the presence of new structures within the countryside. The likely landscape and visual impacts arising during the operation of the Proposed Development would comprise:

- Direct effects on landscape pattern through the temporary or permanent loss or alteration of landscape components such as field pattern, mature trees and landform which could lead to residual effects;
- Direct and indirect effects on landscape character through a change to existing land uses.
- Direct effects on landscape features and elements resulting in the loss of such features.
- Direct and/or indirect effects on the special qualities and defining features of designated landscapes;
- Changes to visual amenity resulting from the loss of existing landscape features; and
- Potential effects of localised landscape enhancements as part of the mitigation scheme, such as reinforcement/reinstatement of woodland belts and an increase in overall vegetation cover.

Mitigation

6.8.4 The routeing selection process for the Proposed Development has enabled consideration of likely significant landscape and visual effects to be integral to the evolution of the project to date. Through the EIA process, the LVIA will seek to inform any further refinements to the Proposed Development and consider where other landscape mitigation measures may be utilised to minimise potential landscape and visual effects.

6.8.5 The implementation of a successful restoration plan will also be important to ensure long term effects of construction access are minimised.

6.8.6 The mitigation of potential landscape and visual effects has been approached through the routeing assessment and will continue to inform the siting and design of the proposed alignments. The LVIA will inform modifications and refinements to the detailed design of the Proposed Development,

including consideration of individual tower locations during the design and assessment process, and the identification of any further appropriate mitigation measures to reduce potential residual effects.

6.9 Potential Significant Effects

6.9.1 The LVIA will consider the potential effects resulting from the construction phase, including temporary vehicular routes for construction vehicles and temporary laydown areas close to the Proposed Development. This will be followed by assessment of the long term / permanent effects resulting from the operational stage of the Proposed Development, comprising new structures associated with the OHL, permanent access tracks, signage, fencing and landscaping including potential ground modelling associate with the Proposed Development.

6.9.2 Significant effects on landscape / visual receptors are typically more likely where the following criteria are met:

- The Proposed Development results in large scale changes which introduce new or discordant elements into the landscape or view, rather than the introduction of small features similar to those already present;
- Effects on views from recognised and important viewpoints or amenity routes; and
- Large numbers of people are affected or the landscape in which people are located is of the highest sensitivity or scenic quality.

6.9.3 In this instance, the potential for significant effects on the landscape and visual resource as a result of the Proposed Development is expected to be relatively localised given the nature of the works (close to an existing overhead line) and the remote nature of the location (with limited settlement / visual receptors in the surrounding area). The main effects are anticipated to relate to the temporary and / or long-term effects on landscape character and views from sensitive receptors, such as residential properties, recreational receptors on core paths or at elevated hill top locations in closest proximity to the Proposed Development.

6.9.4 The LVIA will describe the overall effects on each receptor, with a clear narrative to explain the justification in a transparent manner. For each receptor, a conclusion will be drawn on whether the effect is significant or not.

6.10 Assessment Methodology

General

6.10.1 The landscape and visual assessments will be completed in accordance with the Guidelines for Landscape and Visual Impact Assessment published by the Landscape Institute and IEMA (3rd edition, 2013)[22]. The LVIA will also take account of advice within the following documents:

- Landscape Sensitivity Assessment - Guidance for Scotland (Consultation Draft); NatureScot, 2020[23].
- Landscape Character Assessment: Guidance for England and Scotland; Prepared on behalf of the Countryside Agency and Scottish Natural Heritage, Land Use Consultants, 2002[24].
- Assessing the Cumulative Impact of Onshore Wind Energy Developments NatureScot (2021)[25]
- Technical Guidance Note 06/19: Visual Representation of Development Proposals; Landscape Institute (2019[26]).

[22] Guidelines for Landscape and Visual Impact Assessment. Landscape Institute and IEMA (3rd edition, 2013)
[23] Landscape Sensitivity Assessment - Guidance for Scotland (Consultation Draft); NatureScot, (2020)
[24] Landscape Character Assessment: Guidance for England and Scotland; Prepared on behalf of the Countryside Agency and Scottish Natural Heritage, Land Use Consultants, (2002)
[25] Assessing the Cumulative Impact of Onshore Wind Energy Developments NatureScot (2021)
[26] Technical Guidance Note 06/19 Visual Representation of Development Proposals; Landscape Institute (2019)

- Technical Guidance Note 02/19: Residential Visual Amenity Assessment (RVAA), The Landscape Institute (2019)[27].
- The Holford Rules: Guidelines for the Routeing of New High Voltage Overhead Transmission Lines (with National Grid Company plc (NGC) 1992 and Scottish Hydro-Electric Transmission plc (SHETL) 2003 Notes)[28].

6.10.2 Landscape and visual assessments are separate, though linked, procedures. In both cases the level of impact and the resultant significance of the effect of the Proposed Development on the baseline resource is based upon the correlation between the magnitude of change (i.e. high, medium, low, negligible or none) and the sensitivity of the receptor (i.e. high, medium, low or negligible), which are summarised below.

Landscape Sensitivity

6.10.3 The sensitivity of the landscape to a particular development considers the susceptibility of the landscape and its value. This is assessed by taking into account the existing landscape quality, markers signifying value such as designations, and landscape capacity to accommodate change, which often vary depending on the type of development proposed and the particular site location. As such, sensitivity needs to be considered on a case-by-case basis. This should not be confused with 'inherent sensitivity', where areas of the landscape may be referred to as inherently of 'high' or 'low sensitivity.

Landscape Magnitude of Change

6.10.4 The magnitude of landscape change arising from the Proposed Development at any location will be based on the interpretation of a combination of quantifiable parameters, as follows:

- degree of loss or alteration to key landscape features / elements or characteristics;
- distance from the Proposed Development;
- duration of effect;
- landscape backdrop to the Proposed Development; and
- landscape context of other built development, particularly vertical elements.

Visual Sensitivity

6.10.5 The sensitivity of visual receptors is based on a combination of both susceptibility of the viewer to the Proposed Development and the value of the views obtained. Those living within view of the scheme are usually regarded as the highest susceptibility group, as well as those engaged in outdoor pursuits for whom landscape experience is the primary objective. The susceptibility of potential visual receptors will also vary depending on the activity of the receptor. The value of public views will vary depending on the nature, location and context of the view and the recognised importance of the view.

Visual Magnitude of Change

6.10.6 The magnitude of visual change arising from a development at any particular viewpoint will be based on the following interrelated and largely quantifiable parameters:

- distance of the viewpoint from the Proposed Development;
- duration of effect;
- extent of the Proposed Development in the view;
- angle of view in relation to main receptor activity;
- proportion of the field of view occupied by the Proposed Development;

[27] Technical Guidance Note 02/19: Residential Visual Amenity Assessment (RVAA), The Landscape Institute (2019)

[28] The Holford Rules: Guidelines for the Routeing of New High Voltage Overhead Transmission Lines (with National Grid Company plc (NGC) 1992 and Scottish Hydro-Electric Transmission plc (SHETL) 2003 Notes)

- background to the Proposed Development; and
- extent of other built development visible, particularly vertical elements.

Level of Landscape and Visual Effects

6.10.7 **Table 6.3** describes the main correlations between magnitude of change and sensitivity. This matrix will not be used as a prescriptive tool, but instead will allow for the exercise of professional judgement in the assessment of landscape and visual effects.

Table 6.3: Matrix for Determining the Significance of Effects

		Sensitivity			
		High	**Medium**	**Low**	**Negligible**
Magnitude of Change	**High**	**Major**	**Major**	**Moderate**	Minor
	Medium	**Major**	**Moderate**	Minor	Negligible
	Low	**Moderate**	Minor	Minor	Negligible
	Negligible	Minor	Negligible	Negligible	Negligible
	None	None	None	None	None

6.10.8 For the purposes of this assessment, where the landscape or visual effect is classified as 'major' or 'moderate' this will be considered to be significant. The assessment will be logically set out to maximise its transparency and ensure that conclusions are readily traceable.

6.11 Cumulative Assessment

6.11.1 There is the potential for cumulative landscape and visual effects to arise throughout the study area from the addition of the overhead line components alongside other developments which are either operational, under construction, consented or the subject of a valid application for consent (proposed).

6.11.2 Existing developments, such as wind farms and other vertical infrastructure (e.g. overhead lines and telecommunications masts) form part of the existing baseline environment and will be considered in the LVIA.

6.11.3 The cumulative LVIA (CLVIA) will consider the likelihood for significant cumulative landscape and/or visual effects with other types of proposed development. However, developments will be limited to those which are likely to result in a similar type, scale and extent of landscape and visual effects as the Proposed Development. The developments to be cumulatively assessed will be agreed in line with **Section 3.6**.

6.12 Residential Visual Amenity

6.12.1 A key objective of the design of the Proposed Development is to avoid the placement of individual structures in close proximity to residential properties. The alignment design stage for the project will seek to avoid siting infrastructure within a 170 m radius around all residential properties as far as possible and the Applicant endeavours to maintain a minimum distance of 100 m wherever possible.

6.12.2 Should the final alignment result in towers located within 170 m of a residential property, such properties may require to be assessed as part of a Residential Visual Amenity Assessment (RVAA).

Where the need for such assessment arises it will be undertaken in accordance with the Landscape Institute's Technical Guidance Note 02/19.

6.13 Visualisations

6.13.1 The assessment of effects on landscape and visual receptors will be supported by the preparation of visualisations. The visualisations will be prepared to illustrate the existing views from viewpoints agreed with key consultees and in an agreed format. It is anticipated that this will include visualisations prepared in accordance with THC's Visualisation Standards for Wind Energy Developments[29].

6.13.2 Viewpoints selected for inclusion in the assessment will be either:

- A representative view, selected to represent the experience of different types of visual receptor;
- A specific view chosen because they are key and sometimes promoted viewpoints in the landscape such as the view experienced at a specific visual attraction or a viewpoint of noteworthy visual value; or
- An illustrative view selected to demonstrate a particular effect or specific issue, for example restricted visibility at a key location.

6.13.3 Each viewpoint will include baseline photography and wireline visualisations. A selection of key viewpoints within the study area to each section of Proposed Development will be illustrated with photomontage visualisations to provide a photo-realistic illustration of the change in views.

6.13.4 Consultation will confirm the need for viewpoint photography capturing seasonal changes in views and vegetation.

6.14 Issues Scoped Out

Landscape

6.14.1 Significant effects on the key characteristics of LCTs and Special Qualities of designated landscapes beyond the 10 km study area are not anticipated, as at this distance the perceptibility of changes would be minor. Effects on LCTs beyond 10 km will therefore not be considered.

6.14.2 Night-time working is not anticipated and there is no permanent lighting associated with the towers. There are therefore no anticipated impacts from light pollution as a result of the Proposed Development and night-time landscape effects will not be assessed.

Visual Amenity

6.14.3 Significant effects on visual receptors beyond the 10 km study area are not anticipated, as at this distance the perceptibility of changes would be minor. Effects on visual receptors beyond 10 km will therefore not be considered as part of the LVIA.

6.14.4 Night-time working is not anticipated and there is no permanent lighting associated with the towers. There are therefore no anticipated impacts from light pollution as a result of the Proposed Development and night-time visual effects will therefore not be assessed as part of the LVIA.

6.14.5 Residential properties located at a distance greater than 170 m from the Proposed Development will generally not be assessed as part of the RVAA.

6.15 Summary

6.15.1 The LVIA of the Proposed Development will be conducted in accordance with best practice guidance and examine the potential impacts of the Proposed Development on Landscape and Visual Receptors. In this regard, the LVIA will be prepared in line with the guidance provided in the

[29] Visualisation Standards for Wind Energy Developments, The Highland Council (July 2016)

Guidelines for Landscape and Visual Impact Assessment prepared by the Landscape Institute and supported by visibility mapping and visualisations.

6.15.2 The study area and scope of the assessment (including agreed viewpoints) will be agreed with key consultees and be proportionate to the likely extent of significant and adverse impacts but in the first instance it is proposed that it shall extend to a distance of 10 km from the alignment of the OHL in all directions.

6.15.3 The assessment will consider effects during both the construction and operational phases of the Proposed Development on both landscape and visual receptors. The assessment will not consider effects on landscape and visual receptors beyond 10 km from the alignment and will not consider night-time landscape and visual effects.

7. ECOLOGY AND NATURE CONSERVATION

7.1 Introduction

7.1.1 The chapter describes the potential effects of the Proposed Development on designated sites, habitats and species along the Proposed Development and within the wider local area, as appropriate, based on desk-based resources, field surveys and consultation. Due to the current design stage of the Proposed Development, this chapter will cover the Proposed Route as detailed in **Chapter 2: Description of the Proposed Development** and **Chapter 4: Summary of Sections**.

7.1.2 This Chapter:

- Presents the methods that have been used to generate ecological baseline information;
- Outlines the proposed approach to the ecological impact assessments (as part of the wider EIA); and,
- Describes the key ecological impacts associated with construction and operation of the Proposed Development.

7.2 Baseline Methods

7.2.1 In order to characterise the ecological baseline for the EIAR, a combination of desk-based study and field surveys will be used.

Desk-based Study

7.2.2 A desk-based study has been undertaken to inform this chapter and the ecological surveys to be undertaken throughout 2024. The data from this desk study and from surveys will be used to inform an Ecological Impact Assessment (EcIA) which will be included as a chapter of the EIAR. The study area(s) have been defined based on pertinent sensitive receptors, as detailed below (paragraphs 7.2.4 - 7.2.6) and within the accompanying Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[30].

7.2.3 The desk-based study has used publicly available data sources including NatureScot Sitelink[31], Scotland's Environment Webmap[32], Ordnance Survey and aerial mapping, to identify the designated sites and records of species and habitats within the desk-based study area. This was based on online open-source resources, data purchased from Highland Biological Recording Group (HBRG) and scientific literature; reference is made to these below where applicable.

Designated Sites

7.2.4 Natura 2000 sites (SAC, SPA and Ramsar sites) up to 2 km from the Proposed Development have been included within the desk-based study. Where their interests are solely ornithological these sites have been omitted from this chapter as they are covered within the ornithology chapter (**Chapter 8: Ornithology**). Sites subject to a national statutory designation (SSSI) up to 2 km of the Proposed Development have been included within the desk-based study and national/local nature reserves (non-statutory) up to 2 km have been included.

Species and Habitat Data

7.2.5 A data request was made to HBRG for all designated and invasive species records held covering all route options plus a 500 m buffer. The data was then filtered for species with enhanced levels of protection in the United Kingdom (UK), namely those with national and international levels of legal protection. Records of other species e.g. invertebrates, plants, lower plants and fungi listed on the Scottish Biodiversity List will be revisited following detailed design and in advance of the EIAR when

[30] 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)
[31] https://sitelink.nature.scot/home
[32] https://map.environment.gov.scot/sewebmap/

specific locations of impact will be better understood. As a result, these records have not been considered for the purposes of EIA Scoping.

7.2.6 A desk-based scoping exercise will be undertaken for freshwater pearl mussel (*Margaritifera margaritifera*), using professional judgement and data requested from relevant stakeholders such as NatureScot, District Salmon Fisheries Boards (DSFBs) and the Scottish Marine National Marine Plan Interactive (NMPi)[33]. The aim of the desk-based scoping exercise will be to ascertain if there if there are any watercourses which are unsuitable for freshwater pearl mussel based on the suitability of habitat present, a lack of Atlantic salmon (*Salmo salar*) or brown/sea trout (*Salmo trutta*), barriers to fish passage downstream of a crossing point, or a lack of historical records.

7.2.7 To understand impacts to aquatic fauna including fish, consultation with relevant stakeholders including DSFBs and the Scottish Environment Protection Agency (SEPA) will be undertaken. The aim of this consultation will be to gather data to allow an assessment of the freshwater environment to be undertaken. The request will look to clarify which rivers contain salmonid fish, and where their spawning areas are, as well as understand where any other protected fauna such as the water beetle (*Oreodytes alpinus*) are present to ascertain if these are likely to be affected by the Proposed Development.

7.2.8 Habitats within 250 m either side of the Proposed Development were identified using the Scotland Habitat and Land Cover Map 2020 (NatureScot) dataset. UKHab (UK Habitat Classification) classifications were applied to the habitats identified within each OHL section. Further to this, woodland listed on the Ancient Woodland Inventory (AWI) was mapped using publicly available data and woodlands located within the routes identified.

Field Surveys

7.2.9 All ecological field surveys will be undertaken in respect of the Proposed Development, where the Proposed Development encompasses a single Proposed Alignment plus ancillary infrastructure such as permanent/temporary access tracks. An appropriate buffer will be applied to this depending on the survey type and as detailed below.

Protected Species Survey

7.2.10 A protected species survey of the Proposed Development will be undertaken in order to inform the baseline on which the EcIA will be founded. Protected species are those that are deemed 'sensitive' and especially vulnerable to persecution or over-exploitation and are protected under legislation such as the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)[34], Wildlife and Countryside Act 1981[35] and Protection of Badgers Act 1992[36]. Other notable species of priority, such as those included on the Scottish Biodiversity List (SBL) which are of particular importance for the conservation of biodiversity in Scotland, will also be recorded where identified.

7.2.11 Evidence of protected species including the animals themselves, their places of shelter and other field signs such as footprints, faeces and feeding signs will be searched for up to 30 m from the Limit of Deviation (LoD) of the Proposed Development. Where associated infrastructure is located out with these areas, e.g. compounds and borrow pits, their footprint will be subject to survey plus a 30 m buffer. Species searched for will include those highlighted as present or potentially present through the desk-based study findings (**Section 7.3**) or species likely to be present due to their known UK distribution and the presence of suitable habitat.

[33] Scottish Government National Marine Plan Interactive (NMPi) [Online] Available at: Marine Scotland - National Marine Plan Interactive (atkinsgeospatial.com) (Accessed September 2024)
[34] UK Government Legislation (1994). The Conservation (Natural Habitats, &c.) Regulations 1994. Available at: https://www.legislation.gov.uk/ukpga/1981/69/contents.
[35] UK Government Legislation (1981). Wildlife and Countryside Act 1981. Available at: https://www.legislation.gov.uk/ukpga/1981/69/contents.
[36] UK Government Legislation (1992). Protection of Badgers Act 1992. Available at: https://www.legislation.gov.uk/ukpga/1992/51/contents.

7.2.12 In the case of watercourse crossings, the search area will be expanded to 200 m up and down stream of the LoD in order to identify any otter (*Lutra lutra*) holts that may be used for breeding.

7.2.13 Great crested newts (Triturus cristatus) are known to be present in a limited area of the Proposed Development. Ponds within 500 m of the Proposed Development and in locations where newts are known to be present will be subject to Habitat Suitability Index (HSI) and Environmental Deoxyribose Nucleic Acid (eDNA) assessment. Where presence is confirmed (through eDNA), population surveys will be undertaken as per great crested newt (GCN) guidance[37]. Due to the sensitivity of newts and their enhanced legal protection, population surveys will only be undertaken on the Proposed Alignment, on which the EcIA will be based. Where it is not possible to undertake population surveys, an assumed population score of "Good"6 or "Medium"[38] will be used for the purposes of the impact assessment.

7.2.14 Following the completion of the desk-based scoping exercise for freshwater pearl mussel, freshwater pearl mussel surveys (including habitat assessments) in line with NatureScot guidelines[39] will be undertaken of relevant OHL crossing point locations. In line with NatureScot guidelines, as the Proposed Development is unlikely to result in reduced flows over a reach, surveys will be undertaken for a minimum of 0.1 km upstream and 0.5 km downstream of relevant OHL crossing points.

7.2.15 Where appropriate, further species-specific surveys may be considered as a necessary follow on, in specific locations and based on the results of preceding protected species (and habitat) surveys, e.g. protected species shelter monitoring to determine likelihood of breeding, where a risk of disturbance may be considered likely.

7.2.16 Where species specific surveys are deemed necessary, the specific survey methodology employed will be detailed within the EIAR and will be in keeping with published best practice guidance.

Bats

7.2.17 Due to the scale of the Proposed Development, it is proposed that a high-level habitat classification approach to bat roosting/foraging and commuting potential is taken. This would identify areas of woodland or groups of trees likely to require felling (within the LoD) and classify them based on their general age and condition, then inferring their likelihood of hosting bat roosts. Assessment of the potential for bat roosts in the habitats will be made based on ground observations throughout the survey area. Should any buildings (or other suitable habitat features) be identified for demolition as part of the Proposed Development or be located within 30 m of the LoD, then these would be assessed for their potential to support roosting bats. All bat habitat assessment and classification will be undertaken in line with Bat Conservation Trust (BCT)[40] guidance.

Habitat Survey UKHab

7.2.18 UKHab surveys will be undertaken within the LoD. Surveys will be based on the methods described in the UK Habitat Classification (2023)[41]. The alphanumeric UKHab codes will be reported and mapped within the EIAR. Target notes of features of interest will be recorded with a geographic reference and accompanying photograph(s), where relevant. Plants and their frequency of occurrence will be recorded using the subjective DAFOR scale (dominant, abundant, frequent, occasional or rare). Where encountered, Invasive Non-native Species (INNS) will be recorded and reported. The

[37] Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001), Great Crested Newt Conservation Handbook, Froglife, Halesworth.

[38] English Nature (August 2001). Great crested newt mitigation guidelines. https://www.nature.scot/doc/standing-advice-planning-consultations-great-crested-newts [Accessed 05.02.24].

[39] NatureScot (2020) FRESHWATER PEARL MUSSEL SURVEY PROTOCOL for use in site – specific projects [Online] Available at: Microsoft Word - B398246.doc (nature.scot) (accessed September 2024)

[40] Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines. 4th edition. The Bat Conservation Trust, London.

[41] UKHab Limited(2023). UK Habitat Classification, Version 2.01. Available at: ukhab.org

nomenclature of vascular plants occurring within the defined survey area will follow Stace (2019)[42]. Condition scores for habitats will only be recorded within the LoD.

National Vegetation Classification (NVC)

7.2.19 An NVC survey of habitats with the potential to support Ground Water Dependent Terrestrial Ecosystems (GWDTE), and, where appropriate, other more sensitive habitats such as those within statutory protected sites or associated with e.g. Annex 1 habitats, will be undertaken within the survey area. The survey area will extend up to 250 m from the LoD. The survey will be based on the methods described in Joint Nature Conservation Committee (JNCC) National Vegetation Classification: Users' handbook[43] with communities identified by eye. Target notes of features of interest will be recorded with a geographic reference and photographs taken, as appropriate. NVC mapping beyond the LoD will only extend to GWDTE/potential GWDTEs.

7.3 Baseline Conditions

General

7.3.1 The following sets out the baseline conditions for each section of the Proposed Development, describing statutory and non-statutory designated sites, protected and invasive species and habitats (including woodlands listed on the AWI). Reference should also be made to the Ecology Section of the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[44] in respect to location of sensitive receptors described.

Section A - Spittal to Brora

Designated Sites

7.3.2 **Table 7.1** details the statutory designated sites identified within 2 km of Section A. Only statutory sites with biological feature(s) have been included and all sites with ornithological features are dealt with in the ornithology chapter (**Chapter 8: Ornithology**).

Table 7.1: Statutory Designated Sites Within 2 km of Section A

Site	Features/Description	Proximity (at closest point)
Berriedale and Langwell Waters SAC	The SAC is designated for Atlantic salmon (*Salmo salar*).	Within routes
Berriedale Water SSSI	The SSSI is recognized for its nationally significant birch woodland, a rare habitat in Caithness. It, along with Langwell Water SSSI to the south, constitutes the largest native woodland area in the county. It is also protected for Atlantic salmon. Part of Berriedale Water SSSI overlaps part of Berriedale and Langwell Waters SAC which is designated for the European species Atlantic salmon.	Within routes
Blar nam Faoileag SSSI	Blar nam Faoileag SSSI is located in central Caithness. This site is designated for nationally important blanket bog. Blar nam Faoileag SSSI is part of the Caithness and Sutherland Peatlands SAC which is designated for the European habitats and species.	Within routes
Caithness and Sutherland	Ramsar Criterion 1: • Blanket Bog;	Within routes

[42] Stace, C. (2019). New Flora of the British Isles. 4th edition. UK. Cambridge University Press
[43] Joint Nature Conservation Committee National Vegetation Classification: Users' handbook (2006), Peterborough.
[44] 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)

Site	Features/Description	Proximity (at closest point)
Peatlands Ramsar Site	• Mire; and • Oligotrophic lochs in addition to dystrophic lochs, lochans & pools, and wet heath. Ramsar Criterion 2: • *Sphagnum lindbergii* and *S. majus*. (moss species); • Bog orchid; • *Oreodytes alpinus* (water beetle); • Otter; and • Freshwater pearl mussel.	
Caithness and Sutherland Peatlands SAC	Designated for: • Clear-water lakes or lochs with aquatic vegetation; • Acid peat-stained lakes and ponds; • Blanket bog; • Wet mire; • Otter; and • Marsh saxifrage (*Saxifraga hirculus*).	Within routes
Coire na Beinne Mires SSSI	Coire na Beinne Mires SSSI, situated in central Caithness, is designated for its nationally significant blanket bog. Although not a notified feature, the SSSI woodland also supports Annex II species; otter. Coire na Beinne Mires SSSI is part of the Caithness and Sutherland Peatlands SAC, which is designated for the European habitats and species.	Within routes
Dunbeath Water SSSI	Dunbeath Water SSSI is designated for its national significance woodland habitat.	Within routes
Garbh Allt SSSI	Garbh Allt SSSI encompasses a brief stretch of the Garbh Allt burn as it passes through a ravine 2 km southwest of Helmsdale on the east coast of Sutherland. This SSSI is designated for its nationally significant upland birch woodland thriving within the ravine.	Within routes
Langwell Water SSSI	Langwell Water SSSI is designated for its nationally significant habitat of birch woodland. Part of Langwell Water SSSI overlaps part of Berriedale and Langwell Waters SAC which is designated for the European species Atlantic salmon.	Within routes
Loth Gorge SSSI	Loth Gorge SSSI is designated for the nationally important upland birch woodland which grows in a ravine.	Within routes
Ousdale Burn SSSI	Ousdale Burn SSSI features steep slopes around its lower section that sustain nationally significant birch woodland. The southernmost part of Ousdale Burn SSSI overlaps part of East Caithness Cliffs SAC designated for the European habitat.	Within routes
River Thurso SAC	The River Thurso SAC partially coincides with the Caithness and Sutherland Peatlands SAC and SPA. The site is designated for the conservation of Atlantic salmon.	Within routes
Shielton Peatlands SSSI	Shielton Peatlands SSSI constitutes the largest unbroken expanse of peatland in the eastern region of Caithness. This site is specifically	Within routes

Site	Features/Description	Proximity (at closest point)
	designated for its nationally significant blanket bog habitat and serves as a habitat for upland breeding birds. The SSSI woodland provides support for Annex II species: otter. Shielton Peatlands SSSI is part of the Caithness and Sutherland Peatlands SAC designated for the European habitats and species.	
Berriedale Cliffs SSSI	Berriedale Cliffs SSSI is designated for its nationally significant maritime cliff vegetation, comprising maritime cliff grassland and coastal heath. Ornithological interests are covered in **Chapter 8: Ornithology**. Part of Berriedale Cliffs SSSI overlaps a small part of Ousdale Burn SSSI which is notified for upland birch woodland.	0.1 km
East Caithness Cliffs SAC	This SAC is safeguarded for its vegetated sea cliffs. Found on steep slopes bordering both hard and soft coasts, shaped by past or current marine erosion, this habitat sustains a diverse range of vegetation types influenced by varying maritime conditions.	0.1 km
Moray Firth SAC	The Moray Firth SAC is established to safeguard bottlenose dolphins (*Tursiops truncatus*) and subtidal sandbanks. Its primary objective is to play a role in maintaining the favourable conservation status of the protected features within the Atlantic Biogeographic Region.	0.4 km
Ballinreach Coastal Gorges SSSI	Ballinreach Coastal Gorges SSSI, situated along the east coast of Sutherland between Brora and Loth, is designated for its birch woodland and recognized for its scientific interest.	0.5 km
Knockinnon Heath SSSI	The site is notified for its species-rich lowland dry heath, which is a rare habitat in the Highlands.	1.4 km
Loch Watten SAC	This site is designated for naturally nutrient-rich lakes or lochs which are often dominated by pondweed.	2.0 km
Loch Watten SSSI	The site is designated for its nationally important open water habitat, the fen vegetation that surrounds the loch. Ornithological interests are covered in **Chapter 8**: **Ornithology**. Loch Watten SSSI is also designated as a SAC for the European habitat.	2.0 km

7.3.3 No Nature Reserves or Local Nature Reserves were identified within 2 km of Section A.

Protected Species

7.3.4 Pertinent protected species records identified through the desk-based study for this Section are presented in **Table 7.2**.

Table 7.2: Protected Species Identified Within Section A

Common Name	Latin Name	Number of Records
Adder	*Vipera berus*	4
Common Lizard	*Zootoca vivipara*	3
Slow-worm	*Anguis fragilis*	5
Common Pipistrelle	*Pipistrellus pipistrellus*	1
Eurasian Badger	*Meles meles*	4
Eurasian Otter	*Lutra lutra*	3
European Water Vole	*Arvicola amphibius*	10

Bats

7.3.5 A single record of common pipistrelle was returned just south of Loch of Toftingall.

Herptiles

7.3.6 Four adder records were returned from around Helmsdale, only relevant to Route Options A1.6 and A1.5 of this section. Three records of common lizard were returned from west of Portgower and Balnabruich relevant to Route Options A1.6 and A1.3. Five records of slow worm were recorded from Helmsdale and Dunbeath relevant to Route Options A1.6, A1.6 and A1.3.

Protected Mammals

7.3.7 Four records of badger were returned, all road kills along Route Options A1.5 and A1.3. Three records of otter were returned, spanning this section, however only along Route Options A1.6, A1 and A1.1. Ten water vole records were returned from Route Options A1 and A1.1 located between Loch of Tofingall and Houstry, with the majority clustered around Tacher.

Invasive Non-native Species

7.3.8 No pertinent INNS were identified within this Section during the desk-based study.

Habitats

7.3.9 Habitats within Section A were identified using the Scotland Habitat and Land cover map 2020 (NatureScot) dataset. UKHab classifications were applied to the habitats identified within the section.

7.3.10 Habitats identified within Section A are as follows:

- Cropland - Non-cereal crops;
- Grassland - Modified grassland;
- Grassland - Other neutral grassland;
- Grassland - Upland acid grassland;
- Heathland and shrub - Mixed scrub;
- Heathland and shrub - Mountain heaths and willow scrub;
- Heathland and shrub - Upland Heathland;
- Rivers and Lakes - Oligotrophic and dystrophic lakes;
- Sparsely vegetated land - Other inland rock and scree;
- Urban - Built linear features;
- Urban - Developed land; sealed surface;
- Wetland - Blanket bog;
- Wetland - Upland flushes, fens and swamps;
- Woodland and forest – Felled;
- Woodland and forest - Other coniferous woodland;
- Woodland and forest - Other woodland; broadleaved; and
- Woodland and forest - Other woodland; mixed.

7.3.11 Of the woodland identified within this Section, areas of AWI present are summarised in **Table 7.3.**

Table 7.3: AWI Classification of Woodland Within Section A

Category	Number of AWI Records
1a Ancient (of semi-natural origin)	11
2a Ancient (of semi-natural origin)	12

Category	Number of AWI Records
2b Long-Established (of plantation origin)	2
3 Other (on Roy map)	2

7.3.12 As per SSEN Transmission guidance for Biodiversity Net Gain (BNG)[45] irreplaceable habitats include AWI Categories 1a and 2a, ancient and veteran trees; further details are provided in **Section 7.8**. Within Section A approximately 23 areas of woodland have been identified as being within this SSEN Transmission definition of irreplaceable habitat.

Section B - Brora to Loch Buidhe

Designated Sites

7.3.13 **Table 7.4** details the statutory designated sites identified within 2 km of Section B. Only statutory sites with biological feature(s) have been included and all sites with ornithological features are dealt with in the ornithology chapter (**Chapter 8: Ornithology**).

Table 7.4: Statutory Designated Sites Within 2 km of Section B

Site	Features/Description	Proximity (at closest point)
Dornoch Firth and Loch Fleet Ramsar Site	Dornoch Firth and Loch Fleet Ramsar site is designated a variety of wetland types: • Mound Alderwoods - estuarine alder woodland; • Dornoch Firth and Loch Fleet – estuaries; and • Morrich More – sand dunes. Vascular plants: • Baltic rush; • Seaside centaury; and • Dwarf eelgrass and eelgrass. Mammals: • Harbour seal; and • Otter. Ornithological interests are covered in **Chapter 8: Ornithology**.	Within routes
Mound Alderwoods SAC	This SAC is designated for alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*.	Within routes
Mound Alderwoods SSSI	Mound Alderwoods SSSI is designated for: • Wet woodland; and • Intertidal marine habitats and saline lagoons. Ornithological interests are covered in **Chapter 8: Ornithology**. Mound Alderwoods SSSI is also Mound Alderwoods SAC designated for the European habitat: Alder woodland on floodplains.	Within routes
Strathfleet SSSI	Strathfleet SSSI is designated for: • Upland oak woodland; and • Vascular plants.	Within routes
Torboll Woods SSSI	Torboll Woods SSSI is designated for its richest and most varied of the east Sutherland gorge woodlands.	Within routes

[45] Scottish and Southern Electricity Networks (2020) TG-NET-ENG-526: Biodiversity Net Gain Toolkit User Guide. Version 3.01. SSEN, Perth

Site	Features/Description	Proximity (at closest point)
Carrol Rock SSSI	The site is nationally important for its peatland habitats. Ornithological interests are covered in **Chapter 8: Ornithology**.	0.1 km
Loch Fleet SSSI	Loch Fleet SSSI is designated for: • Intertidal marine habitats: Eelgrass beds & sandflats; • Coastlands: Saltmarsh & sand dunes; • Woodlands: Native pinewood; and • Vascular plants. Ornithological interests are covered in **Chapter 8: Ornithology**. Part of Loch Fleet SSSI is part of the Moray Firth SAC designated for the European habitats and species.	1.6 km
River Evelix SAC	This SAC is designated for freshwater pearl mussel.	1.9 km

7.3.14 Loch Fleet National Nature Reserve (NNR) was identified within 2 km (1.6 km at closest point) of Section B.

Protected Species

7.3.15 Pertinent protected species records identified through the desk study for this Section are presented in **Table 7.5**.

Table 7.5: Protected Species Identified Within Section B

Common Name	Latin Name	Number of Records
Common Lizard	*Zootoca vivipara*	2
European Water Vole	*Arvicola amphibius*	2
Eurasian Otter	*Lutra lutra*	23
Eurasian Badger	*Meles meles*	1
Myotis Bat species	*Myotis*	2
Daubenton's Bat	*Myotis daubentonii*	1
Common Pipistrelle	*Pipistrellus pipistrellus*	8
Soprano Pipistrelle	*Pipistrellus pygmaeus*	3
Brown Long-eared Bat	*Plecotus auritus*	39

Bats

7.3.16 All bat species records were returned from Mound Alderwoods near the River Fleet and were located within Route Option B1.

Herptiles

7.3.17 Both records of common lizard were returned from Coille Innis Bhreac west of Loch Fleet, affecting both Route Options B1 and B1.1.

Protected Mammals

7.3.18 Two records of water vole were returned in the south of this Section. Both are associated with watercourses near Loch Buidhe. Otter records on this section are clustered around Loch Lunndaidh, the River Fleet, Loch Buidhe and Loch Brora. A single record of badger was returned from Mound Alderwoods, near the River Fleet.

Invasive Non-native Species

7.3.19 No pertinent INNS were identified within this Section during the desk-based study.

Habitats

7.3.20 Habitats within Section B were identified using the Scotland Habitat and Land cover map 2020 (NatureScot) dataset. UKHab classifications were applied to the habitats identified within the Section.

7.3.21 Habitats identified within Section B are as follows:

- Cropland - Non-cereal crops;
- Grassland - Modified grassland;
- Grassland - Other neutral grassland;
- Grassland - Upland acid grassland;
- Heathland and shrub - Mixed scrub;
- Heathland and shrub - Mountain heaths and willow scrub;
- Heathland and shrub - Upland Heathland;
- Rivers and Lakes - Oligotrophic and dystrophic lakes;
- Sparsely vegetated land - Other inland rock and scree;
- Urban - Built linear features;
- Urban - Developed land; sealed surface;
- Wetland - Blanket bog;
- Wetland - Upland flushes, fens and swamps;
- Woodland and forest – Felled;
- Woodland and forest - Other coniferous woodland;
- Woodland and forest - Other woodland; broadleaved; and
- Woodland and forest - Other woodland; mixed.

7.3.22 Of the woodland identified within this section, areas of AWI present are summarised in **Table 7.6**.

Table 7.6: AWI Classification of Woodland Within Section B

Category	Number of AWI Records
1a Ancient (of semi-natural origin)	6
2a Ancient (of semi-natural origin)	5

7.3.23 Within Section B approximately 11 areas of woodland have been identified as being within the SSEN Transmission definition of irreplaceable habitat.

Section C - West of Dornoch

Designated Sites

7.3.24 **Table 7.7** details the statutory designated sites identified within 2 km of Section C. Only statutory sites with biological feature(s) have been included and all sites with ornithological features are dealt with in the ornithology chapter (**Chapter 8: Ornithology**).

Table 7.7: Statutory Designated Sites Within 2 km of Section C

Site	Features/Description	Proximity (at closest point)
Kyle of Sutherland Marshes SSSI	The Kyle of Sutherland Marshes is designated for the nationally important floodplain plant communities, woodland and the rare plants that occur on the terraces of the river Oykel. Part of the Kyle of Sutherland Marshes SSSI overlaps with part of the River Oykel SAC, which is designated for European species.	Within routes
River Oykel SAC	This SAC is designated for: • Freshwater pearl mussel; and • Atlantic salmon.	Within routes

7.3.25 No Nature Reserves or Local Nature Reserves were identified within 2 km of Section C.

Protected Species

7.3.26 Pertinent protected species records identified through the desk study for this Section are presented in **Table 7.8**.

Table 7.8: Protected Species Identified Within Section C

Common Name	Latin Name	Number of Records
European Water Vole	*Arvicola amphibius*	3
Wildcat	*Felis silvestris*	1
Eurasian Otter	*Lutra lutra*	1
Pine Marten	*Martes martes*	1
Eurasian Red Squirrel	*Sciurus vulgaris*	1
Daubenton's Bat	*Myotis daubentonii*	3
Pipistrelle Bat species	*Pipistrellus sp.*	1
Common Pipistrelle	*Pipistrellus pipistrellus*	3
Soprano Pipistrelle	*Pipistrellus pygmaeus*	1
Brown Long-eared Bat	*Plecotus auritus*	2

Bats

7.3.27 All bat records returned were close to either the Kyle of Sutherland, Carbisdale Wood or the River Carron along Route Option C1.

Herptiles

7.3.28 The desk-based study did not identify any records of herptiles along Section C.

Protected Mammals

7.3.29 Water vole records were returned from near Invershin and Loch Buidhe. A single record of wildcat was returned from near Carbisdale castle woods. A single otter record was returned north of Invershin. One record of pine marten was returned from next to the Kyle of Sutherland. A single red squirrel record was returned from Carbisdale Castle woods.

Invasive Non-native Species

7.3.30 No pertinent INNS were identified within this Section during the desk-based study.

Habitats

7.3.31 Habitats within Section C were identified using the Scotland Habitat and Land cover map 2020 (NatureScot) dataset. UKHab classifications were applied to the habitats identified within the section.

7.3.32 Habitats identified within Section C are as follows:

- Cropland - Non-cereal crops;
- Grassland - Modified grassland;
- Grassland - Other neutral grassland;
- Grassland - Upland acid grassland;
- Heathland and shrub - Mixed scrub;
- Heathland and shrub - Upland Heathland;
- Rivers and Lakes - Aquifer fed naturally fluctuating water bodies;
- Rivers and Lakes - Oligotrophic and dystrophic lakes;
- Urban - Built linear features;
- Urban - Developed land; sealed surface;
- Wetland - Blanket bog;
- Wetland - Upland flushes, fens and swamps;
- Woodland and forest – Felled;
- Woodland and forest - Other coniferous woodland;
- Woodland and forest - Other woodland; broadleaved; and
- Woodland and forest - Other woodland; mixed.

7.3.33 Of the woodland identified within this Section, areas of AWI present are summarised in **Table 7.9**.

Table 7.9: AWI Classification of Woodland Within Section C

Category	Number of AWI Records
1a Ancient (of semi-natural origin)	1
2a Ancient (of semi-natural origin)	1
2b Long-Established (of plantation origin)	3

7.3.34 Within Section C approximately two areas of woodland have been identified as being within the SSEN Transmission definition of irreplaceable habitat.

Section D - Dornoch to Dingwall

Designated Sites

7.3.35 **Table 7.10** details the statutory designated sites identified within 2 km of Section D. Only statutory sites with biological feature(s) have been included and all sites with ornithological features are dealt with in the ornithology chapter (**Chapter 8: Ornithology**).

Table 7.10: Statutory Designated Sites Within 2 km of Section D

Site	Features/Description	Proximity (at closest point)
Allt nan Caorach SSSI	The Allt nan Caorach SSSI is designated for upland birch woodland and upland habitat of subalpine dry heath.	Within routes

Site	Features/Description	Proximity (at closest point)
Lower River Conon SSSI	The Lower River Conon SSSI is designated for supporting a varied mosaic of habitats including wet alluvial woodland, fens, brackish marsh and saltmarsh. Part of Lower River Conon SSSI overlaps Conon Islands SAC designated for the European habitat Alder woodland on floodplains.	0.8 km
Conon Islands SAC	This SAC is designated for alluvial forests with *black alder* and *European ash*.	0.83 km
Amat Woods SAC	Amat Wood SAC is designated for Caledonian forest that comprises relict, indigenous pine forests.	8.4 km
Ben Wyvis SAC	Ben Wyvis SAC is designated for habitats: • Alpine and subalpine heaths; • Blanket bog; • Dry heaths; • Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels; • Tall herb communities; • Montane acid grasslands; • Plants in crevices on acid rocks; and • Acidic scree.	1.9 km
Ben Wyvis SSSI	Ben Wyvis SSSI is designated for habitats: • Blanket bog; • Upland habitats; • Freshwater habitats of dystrophic and oligotrophic lochs; and • Vascular plants. Ornithological interests are covered in **Chapter 8: Ornithology**. Part of Ben Wyvis SSSI is designated as the Ben Wyvis SAC for European habitats.	1.9 km

7.3.36 Ben Wyvis NNR was identified within 2 km (1.2 km at closest point) of Section D.

Protected Species

7.3.37 Pertinent protected species records identified through the desk study for this Section are presented in **Table 7.11**.

Table 7.11: Protected Species Identified Within Section D

Common Name	Latin Name	Number of Records
Great crested newt	*Triturus cristatus*	15
Slow-worm	*Anguis fragilis*	13
Adder	*Vipera berus*	12
Common Lizard	*Zootoca vivipara*	30
Bat	*Chiroptera*	2
Daubenton's Bat	*Myotis daubentonii*	23
Nyctalus Bat species	*Nyctalus*	1
Pipistrelle Bat species	*Pipistrellus*	7

Common Name	Latin Name	Number of Records
Common Pipistrelle	*Pipistrellus pipistrellus*	4
Soprano Pipistrelle	*Pipistrellus pygmaeus*	8
Brown Long-eared Bat	*Plecotus auritus*	5
Wildcat	*Felis silvestris*	3
Eurasian Otter	*Lutra lutra*	10
Pine Marten	*Martes martes*	41
Eurasian Badger	*Meles meles*	59
Eurasian Red Squirrel	*Sciurus vulgaris*	46

Bats

7.3.38 Daubenton's bat, common pipistrelle and soprano pipistrelle were all recorded on both options in Section D near Strathpeffer. Brown long-eared bat were also recorded on Route Option D1 near Strathpeffer and a single record in the north of the section near the River Carron. Further to this, one Nyctalus species record was identified north of Coulwood near Strathpeffer. One pipistrelle record was identified in the far north of Route Option D1 near the River Carron.

Herptiles

7.3.39 Adder records were returned on both route options as far north as Strathrusdale. Common lizard records were returned at regular intervals along almost the whole extent of both route options for Section D. Slow-worm records were returned from near Strathpeffer and further north near Boath. All great crested newt records were concentrated in the south of Route Option D1 near Strathpeffer.

Protected Mammals

7.3.40 Three wildcat records were returned: two near Strathpeffer and a further record within the route north of Dingwall.

7.3.41 Otters were recorded across both route options but concentrated in the south of the section around Strathpeffer and Dingwall.

7.3.42 Pine marten records were distributed fairly consistently across the southern half of the Section with records distributed across both route options. A single record of pine marten was returned in the north of the section in Strathrusdale.

7.3.43 Badger records were distributed fairly consistently across both route options around Dingwall and Strathpeffer. No records were returned further north of this within Section D.

7.3.44 Red squirrel records were distributed fairly consistently along both route options around Strathpeffer. The only other record of red squirrel recorded along Section D was within Glen Glass.

Invasive Non-native Species

7.3.45 INNS pertinent to the Proposed Development and identified in proximity to the route options are detailed in **Table 7.12**.

Table 7.12: Invasive Species Identified Within Section D

Common Name	Latin Name	Number of Records
New Zealand Flatworm	*Arthurdendyus triangulatus*	4
Japanese Knotweed	*Reynoutria japonica*	1
American Mink	*Neovison vison*	1

7.3.46 All invasive species records returned were in the vicinity of Strathpeffer.

Habitats

7.3.47 Habitats within Section D were identified using the Scotland Habitat and Land cover map 2020 (NatureScot) dataset. UKHab classifications were applied to the habitats identified within the section.

7.3.48 Habitats identified within Section D are as follows;

- Cropland - Non-cereal crops;
- Grassland - Modified grassland;
- Grassland - Other neutral grassland;
- Grassland - Upland acid grassland;
- Heathland and shrub - Mixed scrub;
- Heathland and shrub - Mountain heaths and willow scrub;
- Heathland and shrub - Upland Heathland;
- Rivers and Lakes - Oligotrophic and dystrophic lakes;
- Urban - Built linear features;
- Urban - Developed land; sealed surface;
- Wetland - Blanket bog;
- Wetland - Upland flushes, fens and swamps;
- Woodland and forest - Felled;
- Woodland and forest - Other coniferous woodland;
- Woodland and forest - Other woodland; broadleaved; and
- Woodland and forest - Other woodland; mixed.

7.3.49 Of the woodland identified within this Section, areas of AWI present are summarised in **Table 7.13**.

Table 7.13: AWI Classification of Woodland Within Section D

Category	Number of AWI Records
1a Ancient (of semi-natural origin)	24
2a Ancient (of semi-natural origin)	27
2b Long-Established (of plantation origin)	14
3 Other (on Roy map)	6

7.3.50 Within Section D approximately 51 areas of woodland have been identified as being within the SSEN Transmission definition of irreplaceable habitat.

Section E - Dingwall to Beauly

Designated Sites

7.3.51 **Table 7.14** details the statutory designated sites identified within 2 km of Section E. Only statutory sites with biological feature(s) have been included and all sites with ornithological features are dealt with in the ornithology chapter (**Chapter 8: Ornithology**).

Table 7.14: Statutory Designated Sites Within 2 km of Section E

Site	Features/Description	Proximity (at closest point)
Conon Islands SAC	This SAC is designated for alluvial forests with black alder and European ash.	Within routes

Site	Features/Description	Proximity (at closest point)
Lower River Conon SSSI	The Lower River Conon SSSI is designated for supporting a varied mosaic of habitats including wet alluvial woodland, fens, brackish marsh and saltmarsh. Part of Lower River Conon SSSI overlaps Conon Islands SAC designated for the European habitat Alder woodland on floodplains.	Within routes
Loch Ussie SAC	This site is designated for clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels.	1.9 km
Loch Ussie SSSI	The Loch Ussie SSSI is designated for its freshwater habitat of oligo-mesotrophic loch and upland oak woodland. Loch Ussie SSSI is also Loch Ussie SAC designated for the European habitat clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels.	1.9 km

7.3.52 No Nature Reserves or Local Nature Reserves were identified within 2 km of Section E.

Protected Species

7.3.53 Pertinent protected species records identified through the desk study for this section are presented in **Table 7.15**.

Table 7.15: Protected Species Identified Within Section E

Common Name	Latin Name	Number of Records
Great crested newt	*Triturus cristatus*	1
Slow-worm	*Anguis fragilis*	8
Adder	*Vipera berus*	1
Common Lizard	*Zootoca vivipara*	8
Bat	*Chiroptera*	1
Daubenton's Bat	*Myotis daubentonii*	3
Pipistrelle Bat species	*Pipistrellus*	10
Common Pipistrelle	*Pipistrellus pipistrellus*	6
Soprano Pipistrelle	*Pipistrellus pygmaeus*	14
Wildcat	*Felis silvestris*	1
Brown Hare	*Lepus europaeus*	8
Mountain Hare	*Lepus timidus*	1
Eurasian Otter	*Lutra lutra*	4
Pine Marten	*Martes martes*	12
Eurasian Badger	*Meles meles*	16
Eurasian Red Squirrel	*Sciurus vulgaris*	24

Bats

7.3.54 Records of common pipistrelle, soprano pipistrelle and Daubenton's bat were identified within both route options for Section E, and all were located near Strathpeffer.

Herptiles

7.3.55 One record of adder was returned on Route Option E1.1 near Strathpeffer. Common lizard were identified across both route options, with all records returned from near Strathpeffer. Records of slow-worm were recorded along the length of Section E and were returned from both route options. One record of great crested newt was returned north of Route Option E.1 towards Coulwood.

Protected Mammals

7.3.56 A single wildcat record was identified north of Route Option E1.

7.3.57 A single record of mountain hare was identified in upland habitat west of Beauly on Route Option E1. Records of brown hare were all returned from lower agricultural habitats near Strathpeffer.

7.3.58 Four records of otter were returned for Section E, all associated with the River Conon and its tributaries which coincide with the northern extents of both options.

7.3.59 Pine marten, badger and red squirrel records were identified near Strathpeffer along both route options for Section E.

Invasive Non-native Species

7.3.60 INNS pertinent to the Proposed Development and identified in proximity to the route options are detailed in **Table 7.16**.

Table 7.16: Invasive Species Identified Within Section E

Common Name	Latin Name	Number of Records
American Mink	*Neovison vison*	6

7.3.61 Records of mink were returned from the north and south of Section E clustered near the River Conon in the north and west of the River Beauly in the south.

Habitats

7.3.62 Habitats within Section E were identified using the Scotland Habitat and Land cover map 2020 (NatureScot) dataset. UKHab classifications were applied to the habitats identified within the section.

7.3.63 Habitats identified within Section E are as follows:

- Cropland - Non-cereal crops;
- Grassland - Modified grassland;
- Grassland - Other neutral grassland;
- Grassland - Upland acid grassland;
- Heathland and shrub - Mixed scrub;
- Heathland and shrub - Mountain heaths and willow scrub;
- Heathland and shrub - Upland Heathland;
- Rivers and Lakes - Oligotrophic and dystrophic lakes;
- Urban - Built linear features;
- Urban - Developed land; sealed surface;
- Wetland - Blanket bog;
- Wetland - Upland flushes, fens and swamps;
- Woodland and forest - Felled;
- Woodland and forest - Other coniferous woodland;
- Woodland and forest - Other woodland; broadleaved; and
- Woodland and forest - Other woodland; mixed.

7.3.64 Of the woodland identified within this Section, areas of AWI present are summarised in **Table 7.17**.

Table 7.17: AWI Classification of Woodland Within Section E

Category	Number of AWI Records
1a Ancient (of semi-natural origin)	9
2a Ancient (of semi-natural origin)	15
2b Long-Established (of plantation origin)	13
3 Other (on Roy map)	1

7.3.65 Within Section E approximately 24 areas of woodland have been identified as being within the SSEN Transmission definition of irreplaceable habitat.

7.4 Sensitive Receptors

7.4.1 The key sensitive receptors associated with the Ecology and Nature Conservation chapter of the EIAR will be:

- Nationally and internationally designated sites and their associated features;
- Habitats of value including Annex 1 habitats, those identified as GWDTEs or those classed as irreplaceable (as per SSEN Transmission guidance) such as grade 1a and 2a AWI and blanket bog in good or moderate condition; and
- Species protected under National and International law (mammals (including bats) and herptiles).

7.5 Embedded Mitigation

7.5.1 It is considered reasonable to expect that many construction related effects will be managed through standard practice construction methods and guidance, routinely deployed on SSEN Transmission projects. A CEMP, Construction Traffic Management Plan (CTMP), as well as SSEN Transmission's GEMPs and SPPs will be implemented, which will capture most mitigation measures required in respect of ecological and nature conservation features. The implementation and audit of these measures will be overseen by an Environmental / Ecological Clerk of Works (ECoW) and Environmental Manager.

7.6 Issues Scoped Out

7.6.1 Ecology and nature conservation features identified within this chapter could be affected by lighting, noise, dust, visual disturbance, and pollution (associated with direct release of construction related contaminants to habitats, in particular aquatic/wetland habitats) caused by construction activities. It is anticipated that these issues will be controlled through implementation of embedded mitigation. It is considered that there is no potential for significant impacts and these are scoped out of the assessment. No further assessment of disturbance impacts on ecological and nature conservation receptors is proposed.

7.6.2 Wetland habitats identified as potential GWDTEs to be considered as part of the EIA will be subject to further assessment on the basis of the hydrogeological conductivity calculations undertaken as part of the Water Environment assessment (**Chapter 11: Water Environment**) to determine whether or not they are GWDTEs. This approach may result in some areas of potential GWDTE within 250 m of the Proposed Development being scoped out of the assessment. However, impacts on any confirmed GWDTEs will be assessed.

7.6.3 Hydrological connectivity to sites designated for nature conservation is not expected to exceed 2 km, as such designated sites beyond this threshold are scoped out of the assessment.

7.6.4 Due to the nature of the works, impacts on protected sites, designated only for habitat interest features, at distances of more than 250 m from the Proposed Development will be scoped out. Impacts on peat and peatland will be covered in the Geological Environment assessment (**Chapter 10: Geological Environment**). Similarly, sites designated for ornithological features will be covered in the Ornithology assessment (**Chapter 8: Ornithology**).

7.6.5 Due to the nature of the works, impacts to ecology and nature conservation via emissions to air have been scoped out.

7.7 Potential Significant Effects

7.7.1 Potential adverse effects identified as a result of the desk-based study, and which will be considered in the EIA include:

- Loss of habitat within nationally and internationally designated sites leading to a loss of condition or a reduction of available habitat for cited species;
- Direct mortality to fauna through e.g. traffic collisions and construction related operations (open trenches and woodland felling operations);
- Disturbance/displacement of protected species and their places of shelter through construction related operations;
- Habitat loss both temporary and permanent associated, for example, with temporary and permanent infrastructure;
- Habitat fragmentation and severance e.g. through removal of woodland listed on the AWI creating isolated and fragmented pockets of woodland. Effects may be temporary and permanent associated, for example, with temporary and permanent infrastructure;
- Hydrological change resulting in drying of e.g. GWDTE habitats, or excessive wetting of dryer habitats; and
- Biosecurity risks (spread of invasive species and transmissible plant and animal diseases) resulting in biodiversity loss from the site due to indirect mortality or species being out competed.

7.8 Assessment Methodology

7.8.1 The EcIA will comprise a chapter of the EIA Report and will be completed in accordance with the Chartered Institute of Ecological and Environmental Management (CIEEM) Ecological Impact Assessment Guidance[46].

7.8.2 The assessment will use the ecological baseline to identify the sensitive ecological receptors that could be of importance based on its national, regional, and local conservation status, and population/assemblage trends and other relevant criteria (including size, naturalness, rarity and diversity).

7.9 Additional Non-EIA Assessment

7.9.1 In parallel to the EcIA an assessment of "The Flow Country", United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site (WHS) will be undertaken, focussing on Criterion ix[47], using THC's WHS toolkit.

7.9.2 Further to this a report to inform Habitat Regulations Appraisal (HRA) will be undertaken to identify any Likely Significant Effects (LSEs) arising from the Proposed Development on Natura 2000 sites.

[46] CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.2. Chartered Institute of Ecology and Environmental Management, Winchester.

47 "to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;"

7.10 Proposed Approach to Biodiversity Net Gain

7.10.1 SSEN Transmission has developed specific guidance and toolkits to measure BNG, based on the Natural England Biodiversity Metric 3.1 and adapted to reflect the requirements of Scottish Habitats[48]. Area and linear habitats are assessed separately. The toolkit produces a unit score for three categories of habitat: Biodiversity Units[49], Linear Hedgerow (H) Units and Linear Watercourse (W) Units[50]. The BNG toolkits are used to quantify losses and gains of biodiversity, allowing site locations or design options to be compared and the preconstruction baseline and proposed post-development planting to be assessed. This supports the mitigation hierarchy through project design and development and enables biodiversity units to be calculated and measured.

7.10.2 Irreplaceable habitats and designated sites (e.g. SPAs, SACs, SSSIs) must be identified. Impacts to these areas should be avoided, mitigated and, as a last resort, compensated for, following national legislation, policy, and guidelines. Irreplaceable habitats include AWI Categories 1a and 2a, ancient and veteran trees, and blanket bog (in good or moderate condition). Where unavoidable impacts to irreplaceable habitats are identified, these are removed from the toolkit and assessed separately. The biodiversity metric will be used to calculate the mitigation required for any losses, ensuring more habitat is restored than lost. The restoration of irreplaceable habitats is preferred to the creation of new habitats.

7.10.3 A BNG Assessment Report will be produced, detailing the approach to assessment and toolkit results (including baseline units, post development units, temporary impacts and impacts on irreplaceable habitat). The BNG Assessment Report will include the proposed planting design to achieve the target biodiversity units.

7.10.4 In undertaking BNG reporting, as per SSEN Transmission policy, the requirements of Policy 2 - Nature Protection, Restoration and Enhancement of the Inner Moray Firth Local Development Plan 2 (July 2024) will be met for “National, Major and EIA Developments”, as well as National Planning Framework 4 (NPF4) Policy 3 (Biodiversity).

7.11 Summary

7.11.1 Protected and priority species identified as likely to be present along the Proposed Development include bats, badgers, otter, water vole, pine marten, red squirrel, reptiles and amphibians. The EIA Report will identify where species require to be safeguarded through further pre-construction surveys informing appropriate mitigation prior to construction. This information can be captured and administered through a CEMP and SSEN Transmission’s SPP’s prior to and during construction and audited by an ECoW pre-construction, during construction and post-construction.

7.11.2 Habitats recorded along the Proposed Development from surveys will identify EU Annex 1 habitats and Scottish Biodiversity List priority habitats and potential GWDTEs. These habitats may be affected by excavation and vegetation clearance works during construction. Further to this there is likely to be loss of habitats considered irreplaceable i.e. Category 1a and 2a AWI and blanket bogs in good or moderate condition. These potential effects will be considered in further detail within the EIA Report to establish the potential for significant impacts and identify appropriate mitigation.

7.11.3 At this preliminary stage, possible effects scoped in include mortality and disturbance of protected and priority species, habitat loss and degradation and loss of irreplaceable habitats. All of these effects may also be experienced within statutory designated sites crossed by the Proposed Development.

7.11.4 Issues scoped out of the Ecology and Nature Conservation assessment include;

[48] Scottish and Southern Electricity Networks (2020) TG-NET-ENG-526: Biodiversity Net Gain Toolkit User Guide. Version 3.01. SSEN, Perth
[49] The Biodiversity Units associated with area (polygon) habitats.
[50] The Biodiversity Units associated with linear habitats (hedgerows or watercourses).

- Construction impacts on ecological and nature conservation features associated with lighting, noise, dust, visual disturbance and pollution;
- GWDTEs ruled out through hydrogeological conductivity calculations and those out with 250 m of the Proposed Development;
- Impacts on designated sites potentially hydrologically linked to but in excess of 2 km from the Proposed Development;
- Impacts on protected sites designated only for habitat interest features at distances of more than 250 m from the Proposed Development;
- Impacts on sites designated for geological features only; and,
- Impacts on sites designated for ornithological features.

8. ORNITHOLOGY

8.1 Introduction

8.1.1 This chapter considers the potential effects of the Proposed Development on ornithology receptors along the proposed sections of the route and within the wider local area. For the EIAR, evaluation of the existing baseline will be made through a combination of desk-based study, consultation, and field surveys.

8.2 Methodologies for Baseline Surveys

General

8.2.1 The ornithology baseline for each section of the Proposed Development will be characterised through a combination of desk-based study and field surveys as detailed below. The baseline conditions along each section of the Proposed Development are detailed in **Section 8.3**.

Desk-based Study

8.2.2 A desk-based study was undertaken to identify sensitive ornithological features in the vicinity of the Proposed Development. A review of designated sites was undertaken using the Study Area set out in **Chapter 7: Ecology and Nature Conservation** paragraph 7.2.2 using information from NatureScot SiteLink[51]. Information requests were submitted to, and data was received from:

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

8.2.3 An initial data search was undertaken across various route options, covering a wider area than the route of the Proposed Development considered in this Scoping Report. Records of eagle species out to 6 km from route options and of other priority raptors out to 2 km from route options were obtained from HRSG. The baseline (**Section 8.3**) of this Scoping Report focuses on records of species associated with the route of the Proposed Development.

Field Surveys

8.2.4 The field survey methodology and schedule were based on information gathered from the desk-based study as well as consultation with NatureScot and data-holding bodies listed in paragraph 8.2.3. The field surveys set out below are informed by the known or potential presence of sensitive bird species along the route of the Proposed Development, including qualifying features associated with nearby designated sites.

8.2.5 The following guidance, information and research informed the design of the survey methodology, in addition to species/group specific references listed under the relevant survey methods:

- NatureScot (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms[52];
- NatureScot (2016). Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds[53]; and
- NatureScot (2016). Assessing Connectivity with Special Protection Areas (SPAs)[54].

8.2.6 Based on the location and nature of the Proposed Development as well as the desk-based review of available information, the following bird surveys were identified as required to inform the EIA:

[51] NatureScot SiteLink Website https://sitelink.nature.scot/. Accessed January 2024
[52] NatureScot (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Version 2
[53] NatureScot (2016). Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds
[54] NatureScot (2016). Assessing Connectivity with Special Protection Areas (SPAs). Inverness

- Flight activity surveys;
- Breeding bird surveys;
- Breeding diver surveys;
- Breeding duck and grebe surveys;
- Breeding woodland grouse surveys;
- Breeding and wintering raptor surveys;
- Winter goose roost surveys; and
- Winter goose foraging surveys.

8.2.7 The following sections set out the proposed survey methods for each of these surveys, together with the proposed approach to identifying survey areas for each type of survey.

Flight Activity Surveys

8.2.8 Flight activity surveys from vantage points (VPs) were undertaken to collect data to quantify the level of flight activity and its distribution in the vicinity of proposed OHL infrastructure. The data will also be used to provide an overview of bird usage of the survey area, which will help inform the assessment of potential disturbance and displacement, as well as identify sections of OHL where mitigation measures may be required.

8.2.9 The VP survey methodology is based on guidelines outlined by NatureScot on the assessment of onshore windfarms[55] and the assessment of impacts of power lines on birds[56]. Viewsheds from VPs aim to cover 180 degrees. During each VP survey the viewshed is scanned using binoculars and a telescope, if required, until a target species is detected in flight. Once detected, the bird is followed until it ceases flying or is lost from view. The time the bird is first detected and duration of the flight, while in sight, is recorded on standardised VP recording forms. The flight line of the bird is plotted on to a 1:25 000 scaled map in the field.

8.2.10 The flight height of target species is estimated at the time of detection and at 15 second intervals until the bird(s) are lost from view or have moved outside of the viewshed. Changes in height bands during flights are marked on the map. Flights are categorised into three height bands: below collision risk height (0-5 m); within collision risk height (>5 to 70 m); and above collision risk height (>70 m). If multiple flights occur together, the movement of target species is prioritised over that of secondary species.

<u>Target Species</u>

8.2.11 Flight activity target species comprised:

- All Schedule 1[57] and / or Annex I[58] raptors;
- All owls;
- All divers;
- All geese (except Canada goose (Branta canadensis));
- All terns;
- All skuas;
- All waders;
- All ducks;
- All grebes;

55 NatureScot (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Version 2.

56 NatureScot (2016). Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds. Inverness.

57 UK Government Legislation (1981). Wildlife and Countryside Act 1981. Available at: https://www.legislation.gov.uk/ukpga/1981/69/contents.

58 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM:ev0024&frontOfficeSuffix=%2F

- All gulls; (sections A-B only)[59]
- All grouse species excluding red grouse.

Secondary Species

8.2.12 Flight activity secondary species comprised:

- All egrets;
- Sparrowhawk (Accipiter nisus);
- Kestrel (Falco tinnunculus);
- Buzzard (Buteo buteo);
- Raven (Corvus corax);
- Grey heron (Ardea cinerea); and
- Cormorant (Phalacrocorax carbo).

8.2.13 Passerine flights were not mapped, but movements of large groups of notable birds, i.e., Red Listed Birds of Conservation Concern (BoCC)[60], were recorded. Secondary species flights were not mapped but the number, duration and height of flights was summarised during surveys.

Survey Timing and Effort

8.2.14 Flight activity survey timing and effort follow the recommendations set out by NatureScot[61]:

- 36 hours of observation will be collected from each VP during the breeding season survey;
- 36 hours during the winter season;
- VP watches are of three hours' duration (i.e., 12 three-hour watches per season); and
- VP surveys are stratified across daylight hours to give a representative sample of site use.

8.2.15 Over the 12 months, surveys included a minimum of two watches at dawn (i.e., start 0.5 hours before sunrise – one in autumn and one spring) and a minimum of two dusk watches (i.e., finishing 0.5 hours after sunset – one in autumn and one in spring).

Survey Area

8.2.16 The VP surveys did not achieve 100% coverage of the Proposed Development. The approach in selecting survey areas followed that set out in NatureScot recommendations for bird surveys of OHL projects. Flight activity surveys were targeted at areas within connectivity distance of designated sites for relevant qualifying bird species, and where suitable habitat for qualifying species or other sensitive species existed.

8.2.17 Areas covered by flight activity surveys may change between the breeding and winter seasons (e.g., where intensive arable land provides important foraging habitat for wintering wildfowl but does not support designated site qualifying interest feature or sensitive species during the breeding season). Survey coverage was informed by development of zones of theoretical visibility (ZTVs) using a digital elevation model (DEM) and were 'ground-truthed' to confirm the visible survey area.

8.2.18 VP locations for the 2023 surveys were ground-truthed in April 2023 for the northern half of the Proposed Development (Sections A and B) and September 2023 for the southern half (Sections C to E).

[59] Included as target species for these sections only in order to assess connectivity with associated SPAs for which gulls are a contributory species.
[60] Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. & Win, I. (2021) The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds, 114, 723-747.
[61] NatureScot (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Version 2.

Breeding Bird Surveys

8.2.19 Surveys were undertaken to identify breeding bird communities along the Proposed Development route. The recording methodology is following the approach of Brown & Shepherd[62] and a scaled-down Common Bird Census[63] methodology. The recommended method calls for two survey visits to be undertaken, one between April/May and one in June, in weather conditions suitable for recording (avoiding heavy rain, strong winds, and poor visibility). Due to access constraints, some surveys for the northern half of the Proposed Development undertaken in 2023 were delayed, with some (first) survey visits taking place in June and some second survey visits taking place in July. As a result, additional targeted breeding bird surveys were undertaken in 2024 in areas of suitable habitat for sensitive species for the northern half of the Proposed Development. Breeding bird surveys for the southern half of the Proposed Development were undertaken between April – June in 2024. NatureScot were be consulted on the results of the 2023 surveys for the northern half of the Proposed Development (Sections A and B).

8.2.20 The breeding bird survey routes covered all habitats, except for commercial forestry plantations and intensive arable land. In accordance with guidance[64], the survey area for breeding birds extended to 500 m either side of all initial route options and were refined as the route option design progressed towards identifying a preferred option.

8.2.21 Periodic scanning for birds and stops to listen for bird calls and songs was incorporated into the survey. On completion of surveys, field data was interpreted using British Trust for Ornithology (BTO) breeding evidence criteria to assign birds into one of three categories of breeding status: confirmed, probable and possible.

8.2.22 Breeding skylark (Alauda arvensis) and meadow pipit (Anthus pratensis) populations were defined by the highest recorded count of singing birds from the two survey visits. The number and indicative location of likely bird territories was estimated by grouping species registrations from the two survey visits to produce a breeding bird territory map. Birds flying over the site, species suspected to be on migration, or suspected to be summering non-breeders, were categorised as non-breeding.

8.2.23 Where access tracks or other ancillary infrastructure locations have been finalised following the completion of surveys and will be located outside of surveyed areas, pre-construction follow up surveys may need to be undertaken.

Breeding Diver Surveys

8.2.24 Records of breeding divers were acquired from the RSPB to inform the selection of suitable waterbodies to survey.

8.2.25 Where suitable habitat or existing records of breeding divers were identified, surveys for breeding divers followed best practice methods[65] at suitable waterbodies (i.e., lochans) within 1 km of the Proposed Development. Two survey visits took place for each section of the Proposed Development at each identified lochan between May and July with at least 14 days separating visits. Surveys were undertaken in calm dry conditions. Water and shoreline of suitable lochans were scanned from a distance to avoid disturbing any incubating birds. Bird behaviour was observed, and any potential breeding signs recorded.

8.2.26 All flights observed during the diver surveys were recorded at height bands outlined in paragraph 8.2.9 above. In addition, breeding divers are a target species of the flight activity surveys and these records were expected to identify regular flight routes between nesting and feeding sites.

[62] Brown, A.F. and Shepherd, K.B., 1993. A method for censusing upland breeding waders. Bird Study, 40(3), pp.189-195.
[63] Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird Monitoring Methods. RSPB, Bedfordshire.
[64] NatureScot (2016). Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds.
[65] Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird Monitoring Methods. RSPB, Bedfordshire.

8.2.27 Breeding diver surveys for the northern half of the Proposed Development were undertaken in 2023 in parallel with the general breeding bird surveys. Breeding diver surveys of the southern half of the Proposed Development were undertaken in 2024.

Breeding Ducks and Grebes Surveys

8.2.28 Where there were records of breeding Schedule 1 ducks and/or grebes comprising garganey (*Anas querquedula*), black-necked grebe (*Podiceps nigricollis*), Slavonian grebe (*Podiceps auratus*), common scoter and (*Melanitta nigra*) at suitable waterbodies within 1 km of the route, for these locations, two survey visits to each lochan took place, with at least 14 days separating visits in accordance with best practice[66]. Surveys for the northern half of the Proposed Development were undertaken in 2023, and surveys for the southern half of the Proposed Development were undertaken in 2024.

Raptor Surveys

8.2.29 Records of breeding and roosting raptor sites have been obtained from the HRSG during consultation, along with additional data from RSPB and the HBRG. This consultation helped to avoid unnecessary disturbance by allowing surveys to be targeted at known territories whilst avoiding disturbance of known nest locations. Surveys for raptors were be undertaken in suitable habitat in accordance with best practice methods[67].

8.2.30 For golden eagle (*Aquila chrysaetos*) and white-tailed eagle (Haliaeetus albicilla), surveys extended up to 6 km from the route with respect to breeding territories, and 2 km for roost sites.

8.2.31 Where eagle nest sites were identified, breeding surveys comprised two survey visits between March and July. Where eagle roost sites were identified, one survey visit took place in winter from a suitable VP overlooking the roost site.

8.2.32 Surveys of other breeding raptors were limited to within a 2 km buffer from the route options. Two survey visits took place between March and July at suitable breeding habitats. The exception to this was for owl species (not including short-eared owl (*Asio flammeus*)) and goshawk (*Accipiter gentilis*) whereby the radius was reduced to 1 km from the route in accordance with survey guidance for these species[68].

8.2.33 Hen harrier (*Circus cyaneus*) roosting surveys were triggered through consultation/desk study confirmation of known hen harrier roosts within 2 km of the route. Survey locations were selected based on records identified during the desk-based study and where potential roost sites were identified during flight activity or other bird surveys. Survey methods followed best practice[69], with visits commencing 1.5 hours before sunset and finishing 0.5 hours after sunset during winter.

8.2.34 Raptor surveys for both the northern and southern halves of the Proposed Development were undertaken during the 2023/2024 non-breeding season and the 2024 breeding season.

Woodland Grouse Surveys

8.2.35 Records of lekking sites for black grouse and capercaillie were obtained from RSPB. This consultation helped reduce the danger of unnecessary disturbance to leks, particularly that of capercaillie. Woodland grouse surveys for both the northern and southern halves of the Proposed Development were undertaken during the 2024 breeding season.

66 Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird Monitoring Methods. RSPB, Bedfordshire

67 Hardey, J., Crick, H., Wernham, C., Riley, H. & Thompson, D. (2009): Raptors: a field guide to survey and monitoring. 2nd Edition. Edinburgh.

68 Scottish Natural Heritage (now NatureScot), 2017. Recommended survey methods to inform impact assessment on onshore windfarms. SNH, Battleby, 2017

69 Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird Monitoring Methods. RSPB, Bedfordshire.

8.2.36 Surveys for black grouse lekking sites extended up to 1.5 km from the alignment in suitable habitat in accordance with guidance[70], where records indicated the species liable to be present. Surveys comprised two visits between April and May and followed best practice survey methods[71]. Surveyors scanned pre-identified habitats from strategic locations with a spotting scope, avoiding disturbance. Surveys took place from one hour before dawn until two hours after sunrise, in calm dry conditions with good visibility.

8.2.37 Due to the rare and localised range of capercaillie in Scotland, the survey area for this species is unlikely to extend across the entirety of the route and was significantly refined following consultation and desk study.

8.2.38 Survey methods for lekking capercaillie followed NatureScot guidance[72,73]. Two surveys took place at pre-identified locations from April and May between the hours of 04:00 and 08:00 in calm dry conditions.

Winter Goose Roost Surveys

8.2.39 Winter goose surveys were undertaken at suitable waterbodies (lochs/lochans) within 2 km of route options that could not be viewed from other VP locations (i.e., the waterbody was not located within a VP viewshed). Surveys aimed to identify overnight roosting sites used by geese (and swans) and commuting flight paths to these sites.

8.2.40 All identified waterbodies were surveyed once per month from November-February. Surveys followed best practice methods[74] and were undertaken at either dusk or dawn. Dawn observations at each potential roost site started at least 0.5 hours before sunrise and ended 1 hour after sunrise. Dusk observations at each waterbody started at least 1.5 hours before sunset and ended 0.5 hours after sunset. Surveys for both the northern and southern halves of the Proposed Development were undertaken during winter 2023/2024.

Winter Goose Foraging Surveys

8.2.41 Surveys were undertaken to record goose foraging activity at known goose foraging areas along the Proposed Development. The principle aim of the surveys was to record the number and distribution of target geese species feeding in the vicinity of the proposed power line in order that possible disturbance effects can be assessed. Surveys were targeted at suitable habitats, including arable fields and grasslands, in areas identified as known goose foraging areas from published studies on goose foraging[75]. Survey methods follow those employed for the annual survey of greylag goose in Orkney[76] and consist of a pair of surveyors checking for geese by following the road network and stopping at suitable vantage points. Six surveys for both the northern and southern alignments were undertaken between October 2023 and March 2024.

Survey Programme

8.2.42 During Route selection stage, the northern half of the Proposed Development between Spittal and Loch Buidhe (Sections A and B) were at a more advanced stage. As a result, bird surveys for this half began earlier than that of the southern half which runs from Loch Buidhe to Beauly (Sections C to E). These earlier surveys of the northern sections of the Proposed Development commenced in May 2023, with flight activity surveys, breeding bird surveys, breeding diver surveys and breeding duck and grebe surveys. Surveys on the northern half of the Proposed Development were undertaken until September 2024 to gather at least 72 hours of survey data across each VP, with 36 hours recorded

[70] NatureScot (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Version 2.
[71] Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird Monitoring Methods. RSPB, Bedfordshire.
[72] NatureScot (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Version 2.
[73] NatureScot (2013). Capercaillie Survey Methods. Inverness.
[74] Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird Monitoring Methods. RSPB, Bedfordshire.
[75] Mitchell, C., 2012. Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. WWT Publications.
[76] Mitchell, C., 2012. Mapping the distribution of feeding Pink-footed and Iceland Greylag Geese in Scotland. WWT Publications.

during the breeding season and 36 hours during the non-breeding season. Due to the timing of the surveys, breeding season hours were split between the 2023 and 2024 breeding seasons. This deviated from recommended breeding season survey guidance and will be taken into account in the subsequent presentation of the baseline and the assessment of impacts.

8.2.43 For the southern half of the Proposed Development, 12 months of flight activity surveys commenced in September 2023 and ran until September 2024. Breeding bird surveys for the southern half of the Proposed Development were undertaken between April and July 2024.

8.2.44 Winter goose roost surveys and winter raptor surveys across the whole Proposed Development (north and south) started in October and November 2023, respectively.

8.2.45 Surveys for breeding raptors, black grouse and capercaillie across the whole of the Proposed Development (north and south) where relevant, commenced in March/April 2024. This allowed survey areas to be informed by records obtained from consultation and the results of surveys undertaken during 2023.

8.2.46 **Table 8.1** provides a summary and timeframes for the ornithology surveys.

Table 8.1: Survey Programme

Survey	Section (including subsection)	Timeframe
Flight Activity Surveys	A1, A1.1, A1.3, A1.5, B1, B1.1	May 2023 – September 2024
	A1.6 C1 D1, D1.3 E1, E1.1	September 2023 – August 2024
Breeding Bird Surveys	A1, A1.1, A1.3, A1.5, B1, B1.1	May – July 2023
	A1.6 C1 D1, D1.3 E1, E1.1	April - June 2024
Breeding Diver Surveys	A1, A1.1, A1.3, A1.5, A1.6 B1, B1.1	May - July 2023
	C1 D1, D1.3 E1, E1.1	May - July 2024
Breeding Duck and Grebe Surveys	A1, A1.1, A1.3, A1.5 B1, B1.1	May - July 2023
	A1.6 C1 D1, D1.3 E1, E1.1	April - July 2024
Breeding Raptor Surveys	A1, A1.1, A1.3, A1.5, A1.6 B1, B1.1 C1 D1, D1.3 E1, E1.1	March - July 2024

Survey	Section (including subsection)	Timeframe
Winter Raptor Surveys	A1, A1.1, A1.3, A1.5, A1.6 B1, B1.1 C1 D1, D1.3 E1, E1.1	November 2023 – March 2024
Woodland Grouse Surveys	A1, A1.1, A1.3, A1.5, A1.6 B1, B1.1 C1 D1, D1.3 E1, E1.1	April - May 2024
Winter Goose Roost Surveys	A1, A1.1, A1.3, A1.5, A1.6 B1, B1.1 C1 D1, D1.3 E1, E1.1	November 2023 - February 2024
Winter Foraging Goose Surveys	A1, A1.1, A1.3, A1.5, A1.6 B1, B1.1 C1 D1, D1.3 E1, E1.1	November 2023 - February 2024

8.3 Baseline Conditions

General

8.3.1 The following sections set out the baseline conditions for each section of the Proposed Development. The information presented is based on the results of the desk-based study and field surveys.

Section A - Spittal to Brora

Designated Sites

8.3.2 There are 14 sites with a statutory designation for ornithological interest with potential connectivity to Section A of the Proposed Development[77]. The designations and qualifying features are summarised in **Table 8.2** below, with the details provided in **Appendix C**. Designated sites relevant to Section A can also be visualised on the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[78].

Table 8.2: Designated Sites with Connectivity to Section A of the Proposed Development

Site	Qualifying Feature	Approximate distance from Proposed Development (km)
Caithness and Sutherland Peatlands SPA/Ramsar	Breeding populations of red-throated diver (*Gavia stellata*), black-throated diver (*Gavia arctica*), hen harrier *(Circus cyaneus*), golden eagle *(Aquila chrysaetos),* merlin (*Falco columbarius*), golden plover (*Pluvialis apricaria*), wood sandpiper (*Tringa glareola*), short-eared owl *(Asio flamme*us) dunlin (*Calidris alpina*), common scoter *(Melanitta nigra),* greenshank (*Tringa nebularia*) and wigeon (*Mareca penelope*).	Within

[77] Scottish Natural Heritage (now NatureScot), 2016. Assessing Connectivity with Special Protection Areas – Guidance.

[78] 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)

Site	Qualifying Feature	Approximate distance from Proposed Development (km)
Shielton Peatlands SSSI	Breeding bird assemblage including hen harrier, merlin, peregrine (*Falco peregrinus*), short-eared owl, dunlin, golden plover, greenshank, greylag goose (*Anser anser*), wigeon, red-throated diver, arctic skua (*Stercorarius parasiticus*).	Within
Forsinard Flows RSPB reserve	Bird species include golden plover, dunlin, greenshank, hen harrier, skylark (*Alauda arvensis*), meadow pipit (*Anthus pratensis*), red-throated diver, black-throated diver and common scoter.	Within
Berriedale Cliffs SSSI	Seabird colony; breeding populations of fulmar (*Fulmarus glacialis*), kittiwake (*Rissa tridactyla*), razorbill (*Alca torda*), guillemot (*Uria aalge*), black guillemot (*Cepphus grylle*), great black-backed gull (*Larus marinus*), herring gull (*Larus argentatus*), puffin (*Fratercula arctica*), shag (*Phalacrocorax aristotelis*) and cormorant *(Phalocrocorax carbo).*	0.1
East Caithness Cliffs SPA	Breeding populations including peregrine, guillemot, razorbill, herring gull, kittiwake, shag, great black-backed gull, cormorant and fulmar.	0.1
Moray Firth SPA	Non-breeding populations of great northern diver (*Gavia immer*), red-throated diver, Slavonian grebe, greater scaup (*Aythya marila*), common eider (*Somateria mollissima*), long-tailed duck (*Clangula hyemalis*), common scoter, velvet scoter (*Melanitta fusca*), goldeneye (*Bucephala clangula*), red-breasted merganser (*Mergus serrator*) and shag.	0.4
Caithness Lochs SPA/Ramsar	Non-breeding population of whooper swan (*Cygnus cygnus*), Greenland white-fronted goose (*Anser albifrons flavirostris*) and greylag goose.	2
Loch Watten SSSI	Non-breeding population of greylag goose.	2
Loch Scarmclate SSSI	Non-breeding population of greylag goose.	3.1
Dunbeath Peatlands SSSI	Breeding bird assemblage including dunlin, golden plover, greenshank, red-throated diver, black-throated diver, arctic skua, hen harrier, common scoter, merlin, golden eagle, wigeon, snipe (*Gallinago gallinago*) and curlew (*Numenius arquata*).	4.6
Strathmore Peatlands SSSI	Breeding bird assemblage including greenshank, golden plover, dunlin, wigeon, common scoter, greylag goose, red-throated diver, black-throated diver, short-eared owl, hen harrier and merlin.	5.1
Coir' an Eoin SSSI	Breeding population of golden plover.	7.4
Loch Calder SSSI	Non-breeding population of whooper swan, Greenland white-fronted goose and greylag goose.	7.5
North Caithness Cliffs SPA	Breeding populations including peregrine, guillemot, fulmar, kittiwake, razorbill and puffin.	12.5
Dornoch Firth and Loch Fleet SPA/Ramsar	Breeding population of osprey (*Pandion haliaetus*) and non-breeding populations of bar-tailed godwit (*Limosa lapponica*), greylag goose, wigeon, curlew, teal (*Anas crecca),* greater scaup *(Aythya marila),* redshank (*Tringa totanus*), dunlin and oystercatcher (*Haematopus ostralegus*).	13.2

Species Records and Survey Results

8.3.3 The HRSG provided the location of known hen harrier, golden eagle, and peregrine territories in relation to Section A of the Proposed Development. RSPB provided data on greylag goose, red-

throated diver, black-throated diver, and hen harrier records within the area of the corridor of Section A of the Proposed Development.

8.3.4 The results of surveys available at the time of writing the Scoping Report (October 2024) recorded target species flying at risk height including:

- Schedule 1 raptor species – osprey, golden eagle, goshawk, marsh harrier (*Circus aeruginosus*), hen harrier, red kite (*Milvus milvus*), white-tailed eagle, barn owl (*Tyto alba*), short-eared owl, merlin, and peregrine;
- Diver, duck, grebe, swan and goose species and allies - red-throated diver, greylag goose, pink-footed goose, whooper swan, little grebe (*Tachybaptus ruficolis*), wigeon, tufted duck (*Aythya fuligula*), goldeneye, eider, cormorant and shag;
- Gull and tern species – black-headed gull (*Chroicocephalus ridibundus*), common gull (*Larus canus*), herring gull, great black-backed gull, lesser black-backed gull (*Larus fuscus)*, and Arctic skua; and,
- Wader species – oystercatcher, lapwing (*Vanellus vanellus*), curlew, ringed plover (*Charadrius hiaticula*), golden plover, woodcock *(Scolopax rusticola),* snipe, redshank, and greenshank.

8.3.5 No other target species were recorded in flight at risk height.

8.3.6 Three identified goose roosts were situated in proximity to Section A of the Proposed Development. Pink-footed and greylag geese as well as whooper swans were recorded in flight at risk height or using roost sites.

8.3.7 Goose foraging surveys recorded feeding geese in fields south of Loch Watten around the northern parts Section A of the Proposed Development.

8.3.8 A number of breeding raptor territories were also recorded along Section A including hen harrier, merlin, osprey and red kite.

Section B - Brora to Loch Buidhe

Designated Sites

8.3.9 There are nine sites with a statutory designation for ornithological interest with potential connectivity to Section B of the Proposed Development[79]. The designations and qualifying features are summarised in **Table 8.3** below, with the details provided in **Appendix C**. Designated sites relevant to Section B can also be visualised on the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[80].

Table 8.3: Designated Sites with Connectivity to Section B of the Proposed Development

Site	Qualifying Feature	Approximate distance from Proposed Development (km)
Strath Carnaig and Stath Fleet Moors SPA/SSSI	Breeding hen harrier.	Within
Dornoch Firth and Loch Fleet SPA/Ramsar	Breeding population of osprey and non-breeding populations of bar-tailed godwit, greylag goose, wigeon, curlew, teal, greater scaup, redshank, dunlin and oystercatcher.	Within
Mound Alderwoods SSSI	Breeding bird assemblage including red-breasted merganser, teal, water rail (*Rallus aquaticus*), snipe, redshank and shelduck (*Tadorna tadorna*).	Within

[79] Scottish Natural Heritage (now NatureScot), 2016. Assessing Connectivity with Special Protection Areas – Guidance.
[80] 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)

Site	Qualifying Feature	Approximate distance from Proposed Development (km)
Loch Fleet SSSI	Breeding bird assemblage including ringed plover, oystercatcher, shelduck, eider, common tern, Arctic tern (*Sterna paradisaea*), little tern (*Sternula albifrons*), osprey and Scottish crossbill (*Loxia scotica*), as well as non-breeding eider.	1.6
Moray Firth SPA	Non-breeding populations of great northern diver, red-throated diver, Slavonian grebe, greater scaup, common eider, long-tailed duck, common scoter, velvet scoter, goldeneye, red-breasted merganser, and shag.	2.2
Caithness and Sutherland Peatlands SPA/Ramsar	Breeding populations of red-throated diver, black-throated diver, hen harrier, golden eagle, merlin, golden plover, wood sandpiper, short-eared owl, dunlin, common scoter, greenshank and wigeon.	6.3
Coir' an Eoin SSSI	Breeding population of golden plover.	6.3
Lairg and Strath Brora Lochs SPA/SSSI	Breeding population of black-throated diver.	8
East Caithness Cliffs SPA	Breeding populations including peregrine, guillemot, razorbill, herring gull, kittiwake, shag, great black-backed gull, cormorant, and fulmar.	15.4

Species Records and Survey Results

8.3.10 The HRSG provided the location of known hen harrier, golden eagle, peregrine, and osprey territories in relation to Section B of the Proposed Development and the HBRG also provided records of goshawk and barn owl. RSPB provided data on black grouse, black-throated diver, red-throated diver, golden eagle, white-tailed eagle, and red kite records in relation to the route along Section B of the Proposed Development.

8.3.11 The results of surveys available at the time of writing the Scoping Report (October 2024) recorded target species flying at risk height including:

- Schedule 1 raptor species – osprey, golden eagle, hen harrier, red kite, white-tailed eagle, merlin, and peregrine;
- Diver, duck, grebe, swan and goose species and allies – black-throated diver, red-throated diver, greylag goose, pink-footed goose, gadwall (*Mareca strepera)*, and cormorant;
- Gull and tern species – black-headed gull, common gull, herring gull, great black-backed gull, lesser black-backed gull and common tern (*Sterna hirundo*);
- Wader species – oystercatcher, lapwing, curlew, golden plover, dunlin and snipe; and,
- Grouse species – ptarmigan (*Lagopus muta*).

8.3.12 No other target species were recorded in flight at risk height.

8.3.13 No capercaillie were recorded in surveys but black grouse were although this was in flight below risk height.

8.3.14 Seven identified goose roosts were situated in proximity to Section B of the Proposed Development. Pink-footed and greylag geese were recorded in flight at risk height at these roost sites.

8.3.15 Goose foraging surveys recorded feeding geese in fields at Kirkton and Brora along Section B of the Proposed Development.

8.3.16 Individuals and pairs of red kites were recorded in-flight at-risk height at one of the three identified red kite roosts in proximity to Section B of the Proposed Development. A number of breeding raptor territories were also recorded along Section B including hen harrier, merlin, osprey and red kite.

Section C - West of Dornoch

Designated Sites

8.3.17 There are six sites with a statutory designation for ornithological interest with potential connectivity to Section C of the Proposed Development[81]. The designations and qualifying features are summarised in **Table 8.4** below, with the details provided in **Appendix C**. Designated sites relevant to Section C can also be visualised on the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[82].

Table 8.4: Designated Sites with Connectivity to Section C of the Proposed Development

Site	Qualifying Feature	Approximate distance from Proposed Development (km)
Strath Carnaig and Strath Fleet Moors SPA/SSSI	Breeding hen harrier.	Within
Mound Alderwoods SSSI	Breeding bird assemblage including red-breasted merganser, teal, water rail, snipe, redshank and shelduck.	8.9
Dornoch Firth and Loch Fleet SPA/Ramsar	Breeding population of osprey and non-breeding populations of bar-tailed godwit, greylag goose, wigeon, curlew, teal, greater scaup, redshank, dunlin, and oystercatcher.	8.9
Lairg and Strath Brora Lochs SPA/SSSI	Breeding population of black-throated diver.	9.1
Caithness and Sutherland Peatlands SPA/Ramsar	Breeding populations of red-throated diver, black-throated diver, hen harrier, golden eagle, merlin, golden plover, wood sandpiper, short-eared owl, dunlin, common scoter, greenshank and wigeon.	9.3
Grudie Peatlands SSSI	Breeding populations of dunlin, golden plover, and greenshank.	9.3

Species Records and Survey Results

8.3.18 The HRSG provided the location of known osprey and white-tailed eagle territories in relation to Section C of the Proposed Development and the HBRG also presented records of peregrine and osprey, as well as black grouse. RSPB provided data on black grouse, red-throated diver, and hen harrier records within the area of the corridor of Section C of the Proposed Development.

8.3.19 The results of surveys available at the time of writing the Scoping Report (October 2024) recorded target species flying at risk height including:

- Schedule 1 raptor species – osprey, golden eagle, goshawk, hen harrier, red kite, white-tailed eagle, and merlin;
- Diver, duck, grebe, swan and goose species and allies –greylag goose, pink-footed goose, whooper swan, teal (*Anas crecca),* wigeon, shelduck (*Tadorna tadorna*) and cormorant; and
- Wader species – oystercatcher, lapwing, curlew, and snipe.

8.3.20 No other target species were recorded in flight at risk height.

8.3.21 Hen harrier and osprey breeding territories were recorded along Section C. Black grouse leks were also recorded during surveys along Section C.

[81] Scottish Natural Heritage (now NatureScot), 2016. Assessing Connectivity with Special Protection Areas – Guidance.

[82] 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)

Section D - Dornoch to Dingwall

Designated Sites

8.3.22 There are 11 sites with a statutory designation for ornithological interest with potential connectivity to Section D of the Proposed Development[83]. The designations and qualifying features are summarised in **Table 8.5** below, with the details provided in **Appendix C**. Designated sites relevant to Section D can also be visualised on the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[84].

Table 8.5: Designated Sites with Connectivity to Section D of the Proposed Development

Site	Qualifying Feature	Approximate distance from Proposed Development (km)
Beinn Dearg SPA	Breeding dotterel (*Charadrius morinellus*).	1.1
Novar SPA	Breeding capercaillie (*Tetrao urogallus*).	1.6
Ben Wyvis SSSI	Breeding dotterel.	1.6
Glen Affric to Strathconon SPA	Breeding golden eagle.	2.1
Ben Wyvis SPA	Breeding dotterel.	2.4
Cromarty Firth SPA/Ramsar	Breeding populations of osprey and common tern and non-breeding populations of whooper swan, bar-tailed godwit, greylag goose, redshank, curlew, knot (*Calidris canutus*), red-breasted merganser, pintail (*Anas acuta*), wigeon, dunlin and oystercatcher.	3.8
Cromarty Firth SSSI	Non-breeding populations of bar-tailed godwit, red-breasted merganser, redshank, wigeon and whooper swan.	3.8
Strath Carnaig and Strath Fleet Moors SPA/SSSI	Breeding hen harrier.	6.5
Inner Moray Firth SPA/Ramsar	Breeding populations of osprey and common tern and non-breeding populations of bar-tailed godwit, greylag goose, red-breasted merganser, redshank, greater scaup, curlew, goosander, goldeneye, teal, wigeon and cormorant.	10.5
Dornoch Firth and Loch Fleet SPA/Ramsar	Breeding population of osprey and non-breeding populations of bar-tailed godwit, greylag goose, wigeon, curlew, teal, greater scaup, redshank, dunlin and oystercatcher.	12.4
Caithness and Sutherland Peatlands SPA/Ramsar	Breeding populations of red-throated diver, black-throated diver, hen harrier, golden eagle, merlin, golden plover, wood sandpiper, short-eared owl, dunlin, common scoter, greenshank and wigeon.	12.7

Species Records and Survey Results

8.3.23 The HRSG provided the location of known osprey, golden eagle, and hen harrier territories in relation to Section D of the Proposed Development and the HBRG also provided further records of osprey, red kite and barn owl *(Tyto alba).* RSPB provided data on black grouse, red kite, hen harrier, capercaillie, and Slavonian grebe records in relation to Section D of the Proposed Development.

8.3.24 The results of surveys available at the time of writing the Scoping Report (October 2024) recorded target species flying at risk height including:

- Schedule 1 raptor species – osprey, golden eagle, goshawk, hen harrier, red kite, white-tailed eagle, merlin and peregrine;

[83] Scottish Natural Heritage (now NatureScot), 2016. Assessing Connectivity with Special Protection Areas – Guidance.
[84] 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)

- Diver, duck, grebe, swan and goose species and allies –greylag goose, pink-footed goose, barnacle goose *(Branta leucopsis),* whooper swan, teal, wigeon, and goosander (*Mergus merganser*);
- Wader species – oystercatcher, lapwing, curlew, and snipe; and,
- Grouse species – black grouse.

8.3.25 No other target species were recorded in flight at risk height.

8.3.26 Hen harrier and red-throated diver breeding territories were recorded along Section D. Black grouse leks were also recorded during surveys along Section D.

Section E - Dingwall to Beauly

Designated Sites

8.3.27 There are eight sites with a statutory designation for ornithological interest with potential connectivity to Section E of the Proposed Development[85]. The designations and qualifying features are summarised in **Table 8.6** below, with the details provided in **Appendix C**. Designated sites relevant to Section E can also be visualised on the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer.

Table 8.6: Designated Sites with Connectivity to Section E of the Proposed Development

Site	Qualifying Feature	Approximate distance from Proposed Development (km)
Inner Moray Firth SPA/Ramsar	Breeding populations of osprey and common tern and non-breeding populations of bar-tailed godwit, greylag goose, red-breasted merganser, redshank, greater scaup, curlew, goosander, goldeneye, teal, wigeon and cormorant.	4.2
Beauly Firth SSSI	Non-breeding populations of greylag goose, red-breasted merganser and goosander.	4.2
Glen Affric to Strathconon SPA	Breeding golden eagle.	4.6
Moray Firth SPA	Non-breeding populations of great northern diver, red-throated diver, Slavonian grebe, greater scaup, common eider, long-tailed duck, common scoter, velvet scoter, goldeneye, red-breasted merganser and shag.	6.3
Glen Strathfarrar SSSI	Breeding bird assemblage – 65 species of bird including crested tit (*Parus cristatus*) and Scottish crossbill *(Loxia scotica*).	6.4
Cromarty Firth SPA/Ramsar	Breeding populations of osprey and common tern and non-breeding populations of whooper swan, bar-tailed godwit, greylag goose, redshank, curlew, knot, red-breasted merganser, pintail, wigeon, dunlin and oystercatcher.	6.7
North Inverness Lochs SPA	Breeding Slavonian grebe.	9.1
Balnagrantach SSSI	Breeding Slavonian grebe.	9.1

Species Records and Survey Results

8.3.28 The HRSG provided the location of known osprey and potential honey buzzard territories in relation to Section E of the Proposed Development and the HBRG also provided further records of osprey and

[85] Scottish Natural Heritage (now NatureScot), 2016. Assessing Connectivity with Special Protection Areas – Guidance.

red kite. RSPB provided data on black grouse, red kite, and Slavonian grebe observations within the area of the corridor of Section E of the Proposed Development.

8.3.29 The results of surveys available at the time of writing the Scoping Report (October 2024) recorded target species flying at risk height including:

- Schedule 1 raptor species – osprey, golden eagle, hen harrier, red kite, white-tailed eagle, merlin and peregrine;
- Diver, duck, grebe, swan and goose species and allies – red-throated diver, greylag goose, pink-footed goose, and whooper swan;
- Wader species – oystercatcher, and curlew; and,
- Grouse species – black grouse.

8.3.30 No other target species were recorded in flight at risk height.

8.3.31 Hen harrier, peregrine, osprey, merlin, red kite, goshawk, red-throated diver and Slavonian grebe breeding territories were recorded along Section E. Black grouse leks and signs of capercaillie were also recorded during surveys along Section E.

8.4 Sensitive Receptors

8.4.1 As a result of the information gathered through the desk-based study, consultation and field surveys the following ornithological features were considered to be of sufficient sensitivity to warrant inclusion in the EIA:

- Breeding and wintering raptors (inc. Schedule 1, Annex I, and BoCC Red-listed birds);
- Breeding divers, ducks, and grebes;
- Breeding waders;
- Breeding terns and skuas;
- Black grouse;
- Capercaillie;
- Breeding bird assemblage (general);
- Wintering geese; and
- Seabird and gull species associated with listed designated sites.

8.5 Issues Scoped Out

8.5.1 Due to the nature of the works, impacts to birds and their habitats via emissions to air (e.g., from vehicle emissions during OHL line construction, as set out in **Chapter 2: Description of the Proposed Development Table 2.1**) have been scoped out.

Barrier Effects

8.5.2 Barrier effects occur where the vertical configuration of wires and towers creates an actual or perceived barrier which birds may not cross. There are existing 132 kV OHL and the 275 kV OHL running parallel or in proximity for much of the length to the Proposed Development (particularly Sections A and B). This, together with survey data from other areas of Scotland (e.g., SSEN, 2023)[86] suggests that birds habituate to the presence of OHL and would not treat the Proposed Development as a barrier in these areas. Therefore, the effect of this impact is considered to be of negligible significance and was therefore scoped out from further assessment.

[86] SSEN (2003) Skye Reinforcement Project EIAR. SSEN Transmission.

Electrocution

8.5.3 Electrocution of birds from OHLs can occur where birds perch on or near live conductors. For a bird to be electrocuted it must either make contact with a conductor whilst on top of a tower, make contact with a conductor and an earth wire at the same time, or make contact with two conductors at the same time. The exact configuration of the wires and poles of the Proposed Development is to be confirmed. However, the proposed lattice tower configuration includes at least 16 m horizontal spacing between the conductor wires, with insulators that hang down approximately 5 m from the tower arms supporting the conductors (i.e., a distance of approximately 5 m between the live conductor and tower arm above it). The species present in the Proposed Development area with the largest wingspan is white-tailed eagle, which has a wingspan of 2.4 m. There is therefore considered to be no risk of electrocution from birds perching on conductors and no risk of electrocution for birds sitting on towers, and electrocution risk has been scoped out.

8.6 Potential Significant Effects

8.6.1 The potential significant adverse effects which could result from the construction and operational phases of the Proposed Development, for inclusion within the EIAR, include:

- Effects (both direct and indirect) on the integrity or qualifying features on sites designated for ornithological features;
- Direct mortality of birds e.g. through traffic collisions and nest destruction during construction, and collision with the operational OHL;
- Temporary disturbance/displacement of birds as a result of construction and decommissioning activities;
- Habitat loss e.g. through forestry felling, access track construction and pole/structure locations;
- Habitat fragmentation and severance e.g. through access track construction and forestry removal; and
- Cumulative effects from other developments, either built or proposed, within the zone of influence for ornithological features identified as sensitive receptors of the Proposed Development. The overall approach to cumulative assessment is set out in **Chapter 3: EIA Approach and Methodology Section 3.6** of this Scoping Report. The list of projects to be considered in the cumulative effects assessment will be consulted upon with stakeholders.

8.7 Assessment Methodology

8.7.1 The ornithological impact assessment will be completed in accordance with the Chartered Institute of Ecological and Environmental Management (CIEEM) Ecological Impact Assessment Guidance[87] and in line with the overall impact assessment method set out in **Chapter 3: EIA Approach and Methodology Section 3.3**. The assessment will use the ornithology baseline to identify the sensitive ornithological receptors that could be affected by the construction, operation or decommissioning of the Proposed Development. Each receptor will be assigned a geographic level of importance based on its national, regional and local conservation status and population/assemblage trends and other relevant criteria (including size, naturalness, rarity and diversity). The assessment will take into consideration NatureScot guidance on the assessment and mitigation of impacts of powerlines and guyed meteorological masts on birds[88]. To assess potential collision mortality impacts, a quantitative collision risk assessment will be undertaken using a revised version of the band model developed for use in wind farm impact assessments.

[87] CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.2. Chartered Institute of Ecology and Environmental Management, Winchester.
[88] NatureScot (2016). Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds. Inverness.

8.7.2 As the Proposed Development passes through and within connectivity distance of a number of SPAs and Ramsar sites, an HRA under The Habitats Regulations[89] will be required. As part of the HRA, the competent authority would be required to undertake an Appropriate Assessment. The EIA Report will include relevant information to allow the competent authority to undertake this assessment.

8.8 Summary

8.8.1 Desk study, consultation and preliminary results of surveys have informed the ornithology baseline. Results have identified that the area surrounding the Proposed Development is designated for, and used by, a wealth of sensitive bird receptors including breeding Schedule 1 birds of the Wildlife & Countryside Act 1981, Annex I species of the Birds Directive, and Birds of Conservation Concern. Surveys continued to September 2024 to inform the ornithology baseline for the EIA. Possible effects scope out of the assessment are barrier effects and electrocution. Possible effects scoped in include mortality and disturbance to ornithology receptors, habitat loss and degradation, disturbance and displacement and collision risk.

[89] The Conservation of Habitats and Species Regulations (2017) https://www.legislation.gov.uk/uksi/2017/1012/contents

9. CULTURAL HERITAGE

9.1 Introduction

9.1.1 This chapter considers both designated and non-designated cultural heritage receptors, including buried and surface archaeological remains, historical buildings and historic landscapes. It describes the baseline conditions, provides an initial assessment of the potential for direct, indirect and setting impacts on cultural heritage receptors as a result of the Proposed Development, the potential resulting effects upon those receptors and identifies whether those effects are likely to be significant. It also sets out the scope and methodology to be used in undertaking the cultural heritage assessment.

9.2 Consultation

9.2.1 Initial consultation has been held with Historic Environment Scotland (HES), who have issued a consultation response letter dated 6th October 2023. HES replied to the invitation from SSEN Transmission to comment on potential routes for the Proposed Development. Within the letter are detailed comments on the designated receptors and their settings within HES's remit – scheduled monuments, category A listed buildings, inventory gardens and designed landscapes, and inventory battlefields – that may be impacted by the Project, and suggestions for mitigation. Key highlighted receptors and understandings have been referred to in this chapter and will be carried into the EIA report as appropriate.

9.2.2 The following routes were discussed by HES within the consultation response letter: A1, A1.1, A1.3, A1.4, A1.5, A1.6, B1, B1.1, C1, D1, D3, E1, and E1.1. Route Option D1 Alternative was not discussed in the HES response as it was not available at the time.

9.3 Baseline Conditions

9.3.1 The discussion of baseline conditions presented here is based upon publicly available information provided by HES for designated cultural heritage assets, and National Record Historic Environment (NRHE / Canmore) data for non-designated cultural heritage assets as shown on the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[90]. An extensive baseline assessment has been compiled to feed into the overview given in this section.

9.3.2 The Proposed Development is located along the east coast and eastern inlands of the Highlands, an area considered to be an archaeologically rich and temporally deep, including prehistoric mobility and settlement areas, Pictish remains and features associated with the Highland Clearances.

9.3.3 In order to present a concise archaeological / historical context for the Proposed Development, a preliminary grouping approach, focused on landscape character and geographical context, is presented below. This approach permits initial understandings of archaeological potential to be introduced alongside an indicative selection of sensitive designated receptors. As the design progresses through the assessment process, these groupings will mature to reflect the state of assessment and to further contextualise individual assets within a wider landscape or asset-grouping.

Route Section Review

Northern Lowland Sections (Sections A1, A1.1, and A1.3)

9.3.4 These sections of the Proposed Development are the northernmost along the scheme, and they occupy primarily inland flatlands, traversing north between the peatlands of East Halladale and Munsary-Shielton. Known receptor types range from Neolithic stone circles to Bronze Age brochs, and settlement activity of prehistoric, historic and modern date. With these elements of the Proposed Development being located within the Atlantic Pictland region, there is a higher likelihood of

[90] 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)

identifying Pictish sites here than in more southerly sections of the Proposed Development. However, through landscape changes and the potential for reuse of older monuments during the Pictish period, the most numerous known archaeological receptors relate to agriculture and enclosure from the medieval to post-medieval periods, likely associated with the Highland Clearances, where inland-dwelling and the rural populace were displaced and relocated to coastal areas. There is a high probability of finding additional unknown archaeological receptors in this area as it is likely to be less impacted by medieval to modern ground disturbing activities. This is because the region has a long period of human occupation followed predominantly by sheep rearing.

Central Upland Coastal Sections (Sections A1.5, A1.6, B1, and B1.1)

9.3.5 The central upland sections of the Proposed Development occupy the northern mountainous coastal area along the Moray Firth. This area also contains Neolithic chambered cairn receptors (Canmore ID (CID): 14795) and Iron Age brochs (CID: 6493), suggesting that there may be additional early receptors identified. Information received following public engagement has identified 39 receptors near the A1.5 section near Caen Burn that are not yet recorded within the HES data, many of which date to the prehistoric periods, but also includes medieval to post-medieval era archaeological receptors. This may be indicative of inlet and inland water-related settlement occupation, which varied throughout prehistory and formed the basis for further occupation. As the area is coastal, any potential Roman remains that could be identified are likely to be small finds indicating status, rather than settlements, as transmitted or captured objects. Included in the HES data, the majority of the known archaeological receptors are related to medieval and post-medieval agriculture, such as farmsteads (CID: 91504), corn drying kilns (CID: 132978), and dykes and dams (CID: 6515). This indicates the inhabitants' reliance on both agricultural and marine resources for their livelihoods in the region after the Highland Clearances increased the local population. This is especially significant as the nearby town of Helmsdale is the destination for pilgrimages of the ancestors of people affected by the Highland Clearances and Scottish diaspora to pay their respects[91]. The nearby town of Gartymore was also integral to the formation of the Highland Land League. There is the potential for receptors with intangible as well as tangible value within these two areas.

9.3.6 Near Gordonbush, along the inlet to the North Sea at the River Brora, there is an archaeological site (CID: 6499) where it is believed a battle with the Danes occurred during the early medieval period. This site is where the Danes are thought possibly to have been repelled from the area, further underscoring the influence the region's maritime associations had in shaping the history of the area.

Central Riverine Section (Section C1)

9.3.7 This section is near the confluence of the River Oykel, River Shin, and River Carron, into the Kyle of Sutherland, which leads into Bambuscurrie Bay. This strategic location has heavily influenced the history of the region. In addition, prehistoric receptors and chambered cairns (e.g., SM1817, SM1772) suggest prehistoric peoples occupied and exploited riverine environs in the region, developing a complex landscape of settlement, mortuary monumentality and communicable navigation and bounding. Its defensive location and potential are demonstrated by the presence of the Invershin Castle remains (CID: 13001) from the medieval period. Additionally, the Kyle of Sutherland and River Carron were key obstacles and avenues of approach and retreat during the Battle of Carbisdale (BTL19) in 1650. The accumulated riverine sediments within the region may overlie additional unknown archaeological receptors in certain locations locally.

Southern Lowland Sections (D1N, D1S, D1.3 CA)

9.3.8 These sections are located primarily in the foothill inland and lowland regions from Soyal in the north to Contin in the south. The area is interspersed by both rivers and lochs. Prehistoric hut circle settlements such as *Settlement 1300m NW of Firth View* (SM4728), and high concentrations of cup-

[91] Timespan (2023) Personal Communication. Timespan's response to the proposed new overhead 400KV pylon connection: Spittal to Brora

marked stones near Cnoc A'Bhreacaich and Strath Sgitheach, indicate again the presence of a complex prehistoric landscape, with peoples utilising resources in the region. This raises the potential for additional buried prehistoric archaeological receptors to be identified. The North of Scotland Archaeological Society (NOSAS) has visited the area extensively for the Scotland Rock Art Project (ScRAP). NOSAS noted that the landscape needs to be considered as a whole for its coherence and potential as a known ritual and funerary complex, and that rock art is difficult to identify due to the markings being obscured by moss[92].

9.3.9 Local interest near the River Sgitheach and the surrounding areas has identified various linear crop mark features and ditches in the region[93]. As such, consideration for the conduct of remote sensing surveys is warranted in this area to further analyse and interpret linear features in the region[94]. There is also a large number of agricultural and residential receptors dating from the medieval to post-medieval periods identified by HES and by the *Timespan* team near Ardross[95]. This suggests that there may be additional receptors from these eras found as the Highland Clearances would have impacted the lives of people in this region as well.

Southern Uplands Sections (D3, E1, E1.1)

9.3.10 These sections extend along the uplands from Contin in the north, to Aigas in the south. These uplands are dissected by burns and rivers, with lochs interspersed through the region. There are numerous cairns and cairnfields (such as CID: 12363), along with prehistoric forts (CID: 12375 and 12376), indicating evidence of prehistoric settlement, mortuary monumentality, and communication in the region. There are more known and established Roman sites in this region, likely from the inland portions of Agricola's campaign. Agricola's forces conducted more inland incursions in this area of the Proposed Development as compared to the northern parts of the Proposed Development. Therefore, it is possible that more substantive settlement remains may be identified here than further north along the Proposed Development, where status items would most likely be found. Medieval and post-medieval settlements are also present within the area. One key receptor that lies in the path of the proposed route options, is the Fairburn Garden and Designed Landscape (GDL00174). There are also numerous farmsteads associated with agriculture in the region suggesting there is potential for both the presence of unknown buried archaeology that has been ploughed out / covered by agricultural activities and further unknown abandoned agricultural sites, such as shielings.

Overview

9.3.11 The following quantifies the known heritage resource within and outwith each section of the Proposed Development. This has been informed by the above sections, a review of publicly available data and information supplied following public engagement activities by SSEN Transmission. Each route baseline is accompanied by a summary of key receptors identified during the initial consultation with HES (as per 6th October 2023). Reference should also be made to the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[96].

9.3.12 The peatlands in Section A form part of the Flow Country (an intact and expansive blanket bog system that stretches across Caithness and Sutherland). The Flow Country was inscribed on the World Heritage List to the United Nations Educational, Scientific and Cultural Organisation (UNESCO) as of July 2024. Although the Flow Country World Heritage Site is within Section A, due to its designation criterion it is considered in **Chapter 7: Ecology and Nature Conservation** and **Chapter 10: Geological Environment** and is not included in the cultural heritage baseline.

[92] Community workshop participant. Personal Communication. Member of NOSAS and ScRAP team.
[93] Community workshop participant. Personal Communication Prehistoric Field Systems in the Dingwall Area of Easter Ross.
[94] Best Practice also dictates that aerial imagery and historical mapping be used along the entirety of the route during the EIA phase.
[95] Timespan (2023). Personal Communication. Remembering Ardross Area 27/02/2022.
[96] 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)

Section A – Spittal to Brora

Section A1

Designated Receptors within Proposed Development

9.3.13 There are no world heritage sites, battlefields, gardens and designed landscapes, listed buildings or conservation areas within the Proposed Development. There are two scheduled monuments (SM473 and SM555), a prehistoric standing stone and broch respectively, within the Proposed Development.

Designated Receptors within 10 km of Proposed Development

9.3.14 There are no world heritage sites or battlefields within 10 km of the Proposed Development. There are 121 scheduled monuments within 10 km of the Proposed Development. These range in receptor type and age from prehistoric standing stones to post medieval structures. There is one conservation area (CA114) and one garden and designed landscape (GDL00150) within 10 km of the Proposed Development. There are 8 category A listed buildings; 47 category B listed buildings; and 40 category C listed buildings within 10 km of the Proposed Development.

Non-designated Receptors within Proposed Development

9.3.15 There are 19 non-designated receptors within the Proposed Development. These range in receptor type and age from prehistoric stone settings to post medieval structures.

Non-designated Receptors within 2 km of Proposed Development

9.3.16 There are 135 non-designated receptors within 2 km of the Proposed Development. These range in receptor type and age from prehistoric stone settings to post medieval structures.

Consultation Summary

9.3.17 Selected key receptors identified in the HES OHL route selection consultation from 6th October 2023 are as follows:

9.3.18 Scheduled Monuments:

- Greysteil Castle, broch, Loch Rangang (SM555);
- Achkinloch, chambered cairn 755m SW of, Loch Stemster (SM419); and
- Achkinloch, stone setting SW of, Loch Stemster (SM420).

9.3.19 A setting impact assessment has been advised for the following receptors:

- Achkinloch, chambered cairn 755m SW of, Loch Stemster (SM419); and
- Achkinloch, stone setting SW of, Loch Stemster (SM420).

Section A1.1

Designated Receptors within Proposed Development

9.3.20 There are no world heritage sites, battlefields, gardens and designed landscapes, listed buildings or conservation areas within the Proposed Development. There is one scheduled monument (SM13634), a broch, located within the Proposed Development. Designated Receptors within 10 km of Proposed Development. There are no world heritage sites, battlefields, gardens and designed landscapes, or conservation areas within 10 km of the Proposed Development. There are 84 scheduled monuments located within 10 km of the Proposed Development. These range in age and function from prehistoric hut circles to post medieval structures. There are 5 category A listed buildings; 24 category B listed buildings; and 8 category C listed buildings within 10 km of the Proposed Development.

Non-designated Receptors within Proposed Development

9.3.21 Forty-five non-designated receptors have been identified within the Proposed Development. These range in receptor type and age from prehistoric cairns to post-medieval structures.

Non-designated Receptors within 2 km of Proposed Development

9.3.22 There are an additional 187 non-designated receptors located within 2 km of the Proposed Development that are equally variable in date and function.

Consultation Summary

9.3.23 Selected key receptors identified in the HES OHL route selection consultation from 6th October 2023 are as follows:

9.3.24 Scheduled Monuments:

- Bail A'Charin, broch (SM13634);
- Carn A'Chaldha, broch (SM13632);
- Scouthal Burn, chapel and The Clow (SM721); and
- Category A listed building: Achingale Mill (LB14976).

9.3.25 A setting impact assessment has been advised for the following receptors:

- Bail A'Charin, broch (SM13634); and
- Carn A'Chaldha, broch (SM13632).

Section A1.3

Designated Receptors within Proposed Development

9.3.26 There are no world heritage sites, battlefields, gardens and designed landscapes, listed buildings, or conservation areas within the Proposed Development. There are 15 scheduled monuments within the Proposed Development. These range in age and function from prehistoric brochs to a post medieval settlement.

Designated Receptors within 10 km of Proposed Development

9.3.27 There are no world heritage site or battlefields within 10 km of the Proposed Development. There is one conservation area (CA114) and one garden and designed landscape (GDL00150). There are 97 scheduled monuments within 10 km of the Proposed Development. These range in age and function from prehistoric brochs to a post-medieval industrial dock. There are seven category A listed buildings; 49 category B listed buildings; and 49 category C listed buildings within 10 km of the Proposed Development.

Non-designated Receptors within Proposed Development

9.3.28 Twenty-two non-designated receptors have been identified within the Proposed Development. These range in receptor type and age from neolithic chambered cairns to post-medieval buildings.

Non-designated Receptors within 2 km of Proposed Development

9.3.29 There are 199 non-designated receptors within 2 km of the Proposed Development. These range in receptor age and type from prehistoric burnt mounds to a twentieth century church.

Consultation Summary

9.3.30 Selected key receptors identified in the HES OHL route selection consultation from 6th October 2023 are as follows:

9.3.31 Scheduled Monuments:

- Buolacrabher, settlement 1170m S of (SM6014);

- Buolacrabher, chambered cairn 1550m S of (SM445);
- Buolacrabher, chambered cairn 1350m SSW of (SM5524);
- Minera, hut circles 330m SSE of, 370m ESE of and 270m E of (SM6015);
- Minera, broch 90m SSE of (SM568);
- Minera, standing stone 470m S of (SM457); and
- Upper Borgue, broch (SM596).

9.3.32 The oversailing positioning of this alignment above assets SM6014, SM445, SM5524, SM6015, SM568, and SM457 would result in significant adverse impact on the setting of a severity that would likely result in an objection from HES.

9.3.33 Gardens and Designed Landscapes:

- Dunbeath Castle Inventory Garden and Designed Landscape (GDL00150)

9.3.34 Category A listed buildings:

- Dunbeath Castle (LB7936)

Section A1.5

Designated Receptors within Proposed Development

9.3.35 There are no world heritage sites, battlefields, gardens and designed landscapes, or conservation areas within the Proposed Development. There are nine scheduled monuments within the Proposed Development. These are prehistoric in age, and range in function from domestic homesteads to funerary long cairns. There is one category B and one category C listed building within the Proposed Development.

Designated Receptors within 10 km of Proposed Development

9.3.36 There are no world heritage sites, battlefields, or conservation areas within 10km of the Proposed Development. There are two garden and designed landscapes (GDL00150, GDL00160) within 10 km of the Proposed Development. There are 128 scheduled monuments within the Proposed Development. These range in age and function from prehistoric forts to deserted settlements. There are eleven category A listed buildings; 97 category B listed buildings; and 54 category C listed buildings within 10 km of the Proposed Development.

Non-designated Receptors within Proposed Development

9.3.37 There are 82 non-designated receptors that have been identified within the Proposed Development. These range in age and function from Iron Age brochs to post-medieval rig and furrow.

Non-designated Receptors within 2 km of Proposed Development

9.3.38 There are 417 non-designated receptors that have been identified within 2 km of the Proposed Development. These range in age and function from Viking culinary remains to twentieth century bunkers.

Consultation Summary

9.3.39 Selected key receptors identified in the HES OHL route selection consultation from 6th October 2023 are as follows.

9.3.40 Scheduled Monuments:

- Caen, long cairn and round cairn 470m and 490m W of (SM1770);
- Caen, long cairn 530m NW of, Helmsdale (SM432); and
- Caen, long cairn 460m NNW of (SM1771).

9.3.41 Category A listed buildings:

- Helmsdale Bridge (LB7193); and
- Loth Parish Church (LB7149).

9.3.42 A setting impact assessment has been advised for the following receptors:

- Caen, long cairn and round cairn 470m and 490m W of (SM1770);
- Caen, long cairn 530m NW of, Helmsdale (SM432); and
- Caen, long cairn 460m NNW of (SM1771).

Section A1.6

Designated Receptors within Proposed Development

9.3.43 There are no world heritage sites, battlefields, gardens and designed landscapes, listed buildings, or conservation areas within the Proposed Development. There are 10 scheduled monuments within the Proposed Development. These are prehistoric in age and range from brochs to funerary long cairns.

Designated Receptors within 10 km of Proposed Development

9.3.44 There are no world heritage sites, battlefields, or conservation areas within 10 km of the Proposed Development. There is one garden and designed landscapes (GDL00160) within 10 km of the Proposed Development. There are 62 scheduled monuments within the Proposed Development. These range in age and function from prehistoric forts to deserted settlements. There are six category A listed buildings; 75 category B listed buildings; and 36 category C listed buildings within 10 km of the Proposed Development.

Non-designated Receptors within Proposed Development

9.3.45 There are 95 non-designated receptors that have been identified within the Proposed Development. These range in age and function from prehistoric burnt mounds to a late nineteenth century railway station.

Non-designated Receptors within 2 km of Proposed Development

9.3.46 There are 166 non-designated receptors that have been identified within 2 km of the Proposed Development. These range in age and function from a neolithic cup marked stone to a sixteenth century battlefield.

Consultation Summary

9.3.47 Selected key receptors identified in the HES OHL route selection consultation from 6th October 2023 are as follows.

9.3.48 Scheduled Monuments:

- Clach Mhic Mhios, standing stone, Glen Loth 4000m N of Lothbeg Bridge (SM1778)

Section B - Brora to Loch Buidhe

Section B1

Designated Receptors within Proposed Development

9.3.49 There are no world heritage sites, battlefields, gardens and designed landscapes, or conservation areas within the Proposed Development. There are five scheduled monuments within the Proposed Development (SM13617, SM1772, SM1809, SM1822, SM1846). These range in date and function from historical secular fishponds to prehistoric huts and brochs.

Designated Receptors within 10 km of Proposed Development

9.3.50 There are no world heritage sites or conservation areas within 10 km of the Proposed Development. There is one battlefield (BTL19) the Battle of Carbisdale and two garden and designed landscapes (GDL00160 and GDL00343) within 10 km of the Proposed Development. There are 18 category A listed buildings; 133 category B listed buildings; and 62 listed buildings within 10 km of the Proposed Development.

Non-designated Receptors within Proposed Development

9.3.51 There are 58 non-designated receptors within the Proposed Development. These range in function and date from prehistoric hut circles to post-medieval dykes.

Non-designated Receptors within 2 km of Proposed Development

9.3.52 There are 257 non-designated receptors within 2 km of the Proposed Development. These range in function and date from prehistoric henges to modern fish ladders.

Consultation Summary

9.3.53 Selected key receptors identified in the HES OHL route selection consultation from 6th October 2023 are as follows:

9.3.54 Scheduled Monuments:

- Carrol, broch 600m SSW of, Loch Brora (SM1846);
- Duchary Rock, fort (SM1854); and
- Carn Liath, cairn and chambered cairn 1200m WNW of Torboll (SM1772).

9.3.55 The positioning of this alignment in relation to SM1772 may result in significant adverse impact on the setting of a severity that would likely result in an objection from HES if not mitigated.

Section B1.1

Designated Receptors within Proposed Development

9.3.56 There are no world heritage sites, listed buildings, conservation areas, garden and designed landscapes or battlefields within the Proposed Development. There are three scheduled monuments (SM1772, SM1861, and SM1862) which consist of a prehistoric cairn, fort and broch.

Designated Receptors within 10 km of Proposed Development

9.3.57 There are no world heritage sites, conservation areas, or battlefields within 10 km of the Proposed Development. There are two gardens and designed landscapes (GDL00160 and GDL00343) within 10 km of the Proposed Development. There are 45 scheduled monuments ranging in age and function from prehistoric standing stones to post medieval farmsteads. There are 15 category A listed buildings; 79 category B listed buildings; and 23 category C listed buildings within 10 km of the Proposed Development.

Non-designated Receptors Within Proposed Development

9.3.58 There are 37 non-designated receptors within the Proposed Development. These range in age and function from prehistoric mounds to post medieval townships.

Non-designated Receptors 2 km of Proposed Development

9.3.59 There are 183 non-designated receptors within 2 km of the Proposed Development. These range in age and function from prehistoric mounds to modern war memorials.

Consultation Summary

9.3.60 Selected key receptors identified in the HES OHL route selection consultation from 6th October 2023 are as follows:

9.3.61 Scheduled Monuments:

- East Kinnauld, fort 1000m NE of Eiden (SM1861);
- East Kinnauld School, broch NE of (SM1862); and
- Carn Liath, cairn and chambered cairn 1200m WNW of Torboll (SM1772).

9.3.62 The positioning of this alignment in relation to SM1772 may result in significant adverse impact on the setting of a severity that would likely result in an objection from HES if not mitigated.

Section C - West of Dornoch

Section C1

Designated Receptors within Proposed Development

9.3.63 There are no world heritage sites, conservation areas, or garden and designed landscapes within the Proposed Development. There are five scheduled monuments within the Proposed Development, all of which are prehistoric. They range in function from a settlement to standing stones. There is one battlefield (BTL19). There is one listed building within the Proposed Development. It is category B.

Within 10 km of Proposed Development

9.3.64 There are no world heritage sites or conservation areas within 10 km of the Proposed Development. There is one garden and designed landscape (GDL00343) within 10 km of the Proposed Development. There are 35 scheduled monuments within 10 km of the Proposed Development. These range in age and function from prehistoric standing stones to post medieval industrial sites. There is one category A listed building; 29 category B listed buildings; and 35 category C listed buildings within 10 km of the Proposed Development.

Non-designated Receptors Within Proposed Development

9.3.65 There are 25 non-designated receptors within the Proposed Development. These range in age and function from prehistoric hut circles to nineteenth century cottages.

Non-designated Receptors Within 2 km of Proposed Development

9.3.66 There are 146 non-designated receptors within 2 km of the Proposed Development. These range in age and function from Iron Age brochs to twentieth century graffiti.

Consultation Summary

9.3.67 Selected key receptors identified in the HES OHL route selection consultation from 6th October 2023 are as follows:

9.3.68 Historic battlefields:

- Battlefield of Carbisdale (BTL19)

9.3.69 The positioning of this alignment in relation to BTL19 may result in significant adverse impact on the setting of a severity that would likely require an objection from HES if not mitigated.

9.3.70 Category A listed buildings:

- Shin Viaduct near Kyle of Sutherland (LB279)

Section D - Dornoch to Dingwall

Section D1 – Alternative

Designated Receptors Within Proposed Development

9.3.71 There are no world heritage sites, conservation areas, garden and designed landscapes, listed buildings, scheduled monuments, or battlefields within the Proposed Development.

Designated Receptors Within 10 km of Proposed Development

9.3.72 There are no world heritage sites, battlefields, or conservation areas within 10 km of the Proposed Development. There are two gardens and designed landscapes (GDL00023, GDL00303) within 10 km of the Proposed Development. There are 23 scheduled monuments within 10 km of the Proposed Development. These range in age and function from prehistoric roundhouses to a post medieval castle. There are 11 category A listed buildings; 40 category B listed buildings; and 21 category C listed buildings within 10 km of the Proposed Development.

Non-designated Receptors within Proposed Development

9.3.73 There are 11 non-designated receptors within the Proposed Development. These range in age and function from prehistoric hut circles to a medieval kiln barn.

Non-designated Receptors within 2 km of Proposed Development

9.3.74 There are 75 non-designated receptors within 2 km of the Proposed Development. These range in age and function from neolithic chambered cairns to a twentieth century shooting stand.

Consultation Summary

9.3.75 Route section D1 Alternative was not discussed in the HES letter.

Section D1 – North

Designated Receptors within Proposed Development

9.3.76 There are no world heritage sites, conservation areas, garden and designed landscapes, scheduled monuments, or battlefields within the Proposed Development.

Designated Receptors within 10 km of Proposed Development

9.3.77 There are no world heritage sites or conservation areas within 10 km of the Proposed Development. There is one garden and designed landscape (GDL00023) and one battlefield (BTL19) within 10 km of the Proposed Development. There are 28 scheduled monuments within 10 km of the Proposed Development. These range in age and function from prehistoric forts to deserted villages. There are 9 category A listed buildings; 25 category B listed buildings; and 31 category C listed buildings within 10 km of the Proposed Development.

Non-designated Receptors within Proposed Development

9.3.78 There are 11 non-designated receptors within the Proposed Development. These range in age and function from an Iron Age broch to a nineteenth century weaving shed.

Non-designated Receptors within 2 km of Proposed Development

9.3.79 There are 63 non-designated receptors within 2 km of the Proposed Development. These range in age and function from neolithic chambered cairns to a twentieth century road block.

Section D1 – South

Designated Receptors within Proposed Development

9.3.80 There are no world heritage sites, conservation areas, garden and designed landscapes, listed buildings, or battlefields within the Proposed Development. There are four scheduled monuments within the Proposed Development that range in age and function from prehistoric roundhouses to a post-prehistoric crannog.

Designated Receptors within 10 km of Proposed Development

9.3.81 There are no world heritage sites or battlefields within 10 km of the Proposed Development. There are six gardens and designed landscapes and two conservation areas within 10 km of the Proposed Development. There are 59 scheduled monuments within 10 km of the Proposed Development.

These range in age and function from prehistoric forts to a post-medieval mausoleum. There are 19 category A listed buildings; 139 category B listed buildings; and 55 category C listed buildings within 10 km of the Proposed Development.

Non-designated Receptors within Proposed Development

9.3.82 There are 77 non-designated receptors within the Proposed Development. These range in age and function from prehistoric field systems to a twenty-first century war memorial.

Non-designated Receptors within 2 km of Proposed Development

9.3.83 There are 295 non-designated receptors within 2 km of the Proposed Development. These range in age and function from prehistoric burial cairns to a twentieth century bath house. There are two receptors identified within the received public engagement datasets within 2 km of the Proposed Development: a chambered cairn and a cup and ring marked stone both dating to the prehistoric periods.

Consultation Summary

9.3.84 Selected key receptors identified in the HES OHL route selection consultation from 6th October 2023 are as follows:

9.3.85 Scheduled Monuments:

- Balmacrae, chambered cairn 230m WSW of (SM2396);
- Strath Sgitheath, settlement NW of Cnoc A'Mhuilinn (SM10495); and
- Firth View, settlement 1300m NW of (SM4728).

9.3.86 Category A listed buildings:

- Strathcarron Croick Parish Church and burial ground (LB7181);
- Coul House Hotel formerly Coul House (LB1769);
- Foulis Castle (LB7911);
- Tulloch Castle, Caisteal Gorach (LB24520); and
- Castle Leod (LB7826).

9.3.87 Gardens and Designed Landscapes:

- Novar (GDL00303); and
- Castle Leod (GDL00094).

Section D3

Designated Receptors within Proposed Development

9.3.88 There are no world heritage sites, conservation areas, garden and designed landscapes, listed buildings, scheduled monuments, or battlefields within the Proposed Development.

Designated Receptors within 10 km of Proposed Development

9.3.89 There are five gardens and designed landscapes and three conservation areas within 10 km of the Proposed Development. There are 43 scheduled monuments within 10 km of the Proposed Development. These range in age and function from prehistoric barrows to a deserted village. There are 10 category A listed buildings; 121 category B listed buildings; and 58 category C listed buildings, one of which is group category B, within 10 km of the Proposed Development.

Non-designated Receptors within Proposed Development

9.3.90 There are 31 non-designated receptors within the Proposed Development. These range in age and function from a prehistoric hut circle to a modern hydroelectric power station.

Non-designated Receptors within 2 km of Proposed Development

9.3.91 There are 203 non-designated receptors within 2 km of the Proposed Development. These range in age and function from prehistoric burnt mounds to a nineteenth century golf course.

Consultation Summary

9.3.92 Selected key receptors identified in the HES OHL route selection consultation from 6th October 2023 are as follows:

9.3.93 Category A listed buildings:

- Contin Bridge over River Black Water (LB1789)

Section E - Dingwall to Beauly

Section E1

Designated Receptors within Proposed Development

9.3.94 There are no world heritage sites, conservation areas, or battlefields within the Proposed Development. There is one garden and designed landscape (GDL00174) within the Proposed Development. There are two scheduled monuments within the Proposed Development. These are two prehistoric forts. There is one category A listed building and two category B listed buildings within the Proposed Development.

Designated Receptors within 10 km of Proposed Development

9.3.95 There are four gardens and designed landscapes and three conservation areas within 10 km of the Proposed Development. There are 61 scheduled monuments within 10 km of the Proposed Development. These range in age and function from prehistoric ring cairns to a post-medieval distillery. There are 14 category A listed buildings; 162 category B listed buildings; and 76 category C listed buildings, one of which is group category B, within 10 km of the Proposed Development**.**

Non-designated Receptors within Proposed Development

9.3.96 There are 49 non-designated receptors within the Proposed Development. These range in age and function from a prehistoric dun to nineteenth century farmsteads. Some 28 receptors were identified from the received public engagement datasets within the Proposed Development. These receptors range in age and function from prehistoric cairns to post-medieval barns.

Non-designated Receptors within 2 km of Proposed Development

9.3.97 There are 265 non-designated receptors within 2 km of the Proposed Development. These range in age and function from prehistoric field systems to a modern petrol station. There is one receptor identified within the received public engagement datasets: a prehistoric chambered cairn.

Consultation Summary

9.3.98 Selected key receptors identified in the HES OHL route selection consultation from 6th October 2023 are as follows:

9.3.99 Scheduled Monuments:

- Dun Fhamhair, fort (SM5212);
- Dun A Chliabhain, fort (SM2424);
- Dun Garbhlaich, fort, Kilmorak (SM2422); and

- Dun Mor, fort (SM4979).

9.3.100 The positioning of this alignment in relation to SM5212, SM2424, SM2422, and SM4979 may result in significant adverse impact on the setting of a severity that would likely require an objection from HES if not mitigated.

9.3.101 Gardens and Designed Landscapes:

- Fairburn Inventory Garden and Designed Landscape (GDL00174)

9.3.102 Category A listed buildings:

- Fairburn Tower (LB14030)

Section E1.1

Designated Receptors within Proposed Development

9.3.103 There are no world heritage sites, conservation areas, listed buildings, or battlefields within the Proposed Development. There is one garden and designed landscape (GDL00174) within the Proposed Development.

Designated Receptors within 10 km of Proposed Development

9.3.104 There are no world heritage sites or battlefields within 10 km of the Proposed Development. There are four garden and designed landscapes and three conservation areas within 10 km of the Proposed Development. There are 52 scheduled monuments within 10 km of the Proposed Development. These range in age and function from prehistoric enclosures to a medieval priory. There are 15 category A listed buildings; 148 category B listed buildings; and 71 category C listed buildings, one of which is group category B, within 10 km of the Proposed Development.

Non-designated Receptors within Proposed Development

9.3.105 There are 22 non-designated receptors within the Proposed Development. These range in age and function from prehistoric forts to a twentieth century fundamental bench-mark.

Non-designated Receptors within 2 km of Proposed Development

9.3.106 There are 167 non-designated receptors within 2 km of the Proposed Development. These range in age and function from neolithic chambered cairns to a Second World War military camp. There is on receptor identified within the received public engagement datasets, a prehistoric chambered cairn.

Consultation Summary

9.3.107 Selected key receptors identified in the HES OHL route selection consultation from 6th October 2023 are as follows:

9.3.108 Gardens and Designed Landscapes:

- Fairburn Inventory Garden and Designed Landscape (GDL00174)

9.3.109 Category A listed buildings:

- Fairburn Tower (LB14030)

9.4 Potential Impacts

9.4.1 Impacts to heritage assets may occur as a result of the Proposed Development through three discrete channels:

Direct Impacts

9.4.2 In cultural heritage terms, a direct impact refers to a change that materially alters the state of the baseline condition of a heritage asset resulting directly from project activity and operational processes. These are able to be identified and represented spatially by assessing and understanding

the known heritage presence and context, in conjunction with the relationship to project design features.

9.4.3 Direct impacts to heritage assets may occur as a result of the following project activities occurring in the Proposed Development:

- Construction of OHL towers and installation of conductors
- Rationalisation of existing infrastructure
- Construction of construction compounds and other temporary works (see paragraph 2.1.1)
- Access track installation / upgrade

Indirect Impacts

9.4.4 In cultural heritage terms, an indirect impact refers to any change in the baseline condition of a heritage asset resulting from a development beyond the boundaries of the asset. Indirect impacts can have a variety of forms, including (but not limited to): increased noise or dust generation, restrictions on access or mobility, soil geochemistry alteration or changes to groundwater dynamics; for instance if a development affects the water table, it could potentially damage the preservation of organic remains within buried archaeological contexts beyond its boundaries.

Setting Impacts

9.4.5 In Cultural Heritage terms, setting may contribute to the value of a heritage asset where the surroundings of an historic asset or place, and how contribute to how it is understood, appreciated and experienced. This may extend to landscape of townscape context/character, key views or vistas, prominence, or connected places.[97]

9.4.6 Setting impacts refer to the potential introduction of changes to the wider landscape siting of heritage assets, as a consequence of the Proposed Development. Such changes may be assessed with regard to inter-visibility, landscape prominence, interruption of views/framed perspective, landscape character or truncation of contiguous spaces; depending upon the value contribution to assets or asset groupings and their landscape context.

9.5 Sensitive Receptors

9.5.1 Designated and non-designated sensitive receptors for each route have been informed by the key component information of the Proposed Development as outlined in **Chapter 2: Description of the Proposed Development**. This includes in relation to the proximity of any receptors to the Proposed Development, enabling a preliminarily identification of cultural heritage receptors. These are further categorised as specifically sensitive using the approach described below.

Methodological Approach

9.5.2 All designated and non-designated receptors identified within the Proposed Route sections were considered to have the potential to be directly impacted as tower, access road etc., locations have not been finalised. Direct effects can include complete or partial physical removal of a receptor, or similarly the complete or partial destruction of a receptor that has value due to its association or inter-connectivity of surrounding receptors.

9.5.3 All designated receptors within 10 km of the Proposed Development were considered to have the potential to receive indirect or setting effects due to the uncertainty in the exact placement of the infrastructure needed for the Proposed Development and the height of the lattice towers. Similarly, non-designated receptors within 2 km of the Proposed Development were considered to have the potential to receive indirect or setting effects due to the uncertainty in the exact placement of the infrastructure needed for the Proposed Development and the height of the lattice towers.

[97] Historic Environment Scotland. 2016. Managing Change in the Environment: Setting.

9.5.4 Indirect effects can include the introduction of noise, dust, or vibration to the environs of a receptor that influence how the receptor is understood or appreciated. Alternatively, indirect effects can include changes to the water table or soil chemistry that alters the site. An example of this is moated sites where a development can cut off the water supply to a moat and thereby dry the moat and change the soil formation/deposition processes at the site. This alters the depth of the moat and how it is perceived in the landscape. Setting effects are visual intrusions (which can include oversailing) where a receptor has value from key viewpoints that can be blocked by the intrusion of buildings or structural elements.

9.5.5 This broad approach was also taken to understand the potential landscape character of the area as well as understand the temporal range and tangible or intangible function of potential unknown buried archaeology in the region. This is also important to understand because the nature of the Proposed Development has the potential to introduce new characteristics to the landscape via visual intrusion and potential oversailing, as well as directly or indirectly affecting receptors within the various route sections.

9.6 Issues Scoped Out

9.6.1 There is the potential for direct and/or indirect effects on the significance of known and/or potential cultural heritage receptors to result from the Proposed Development along all route sections. Assessment of direct, indirect and setting effects on cultural heritage is therefore required as part of the Environmental Impact Assessment.

9.6.2 As D1 Alternative, D1 North, and D3 do not have designated receptors within the Proposed Development area, designated receptors will not receive direct effects from the Proposed Development during any phase. For all other routes there remains potential for designated and non-designated receptors to receive direct, indirect, and setting effects.

9.6.3 Direct effects as a result of ground disturbance are not anticipated as a result of routine maintenance utilising existing access tracks and are therefore scoped out of the assessment of the operation phase. Only indirect effects from dust and vibration can be scoped out during the operation phase of the Proposed Development.

9.6.4 Due to the strategic and permanent nature of the Proposed Development, the decommissioning phase is scoped out.

9.7 Potential Significant Effects

9.7.1 Effects to cultural heritage receptors have the potential to occur during the construction, operation and decommissioning phases as a result of direct, indirect, or setting impacts. For the purposes of assessment, adverse or positive **moderate** or **major** effects to cultural heritage receptors as a result of the Proposed Development are defined as significant.

9.7.2 The sensitive receptors range in sensitivity from **low to high**. Given the potential magnitude of impact (**no change / negligible to high)**, the resulting effect on receptors resulting from the Proposed Development may range from **no change / negligible to major.**

Ground-breaking Activities

9.7.3 Direct and indirect impacts to receptors may occur during the construction and decommissioning phases. Ground-breaking activities must be assessed against the sensitivity of the asset and their magnitude of impact. The potential magnitude of impact could range from **no change / negligible to high**. This assessment has the potential to result in the reporting of significant effects.

Changes in Setting

9.7.4 During the construction phase the activities associated with the works have the potential to introduce temporary significant effects to heritage receptors through works activity. The operational phase

represents the completed Proposed Development absent works activity, and has the potential to introduce permanent significant effects to heritage receptors, as a result of introducing a change to the baseline environment setting for the long-term duration of the Proposed Development.

9.8 Assessment Methodology

Legislation, Policy and Guidance

9.8.1 The cultural heritage EIA will be undertaken within the following legislative, policy and guidance context:

- The Ancient Monuments and Archaeological Areas Act 1979;
- The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997;
- The Historic Environment (Amendment) (Scotland) Act 2011 (this includes amendments to the above);
- National Planning Policy Framework 4 (NPF4) (Scottish Government 2023);
- Historic Environment Policy for Scotland (HEPS 2019);
- Planning Advice Note Planning and Archaeology PAN 2/2011;
- Historic Environment Circular 1, HES 2016;
- The Highland-Wide Local Development Plan (2012);
- Caithness and Sutherland Local Development Plan (CaSPlan) (2018);
- Ross and Cromarty East Local Plan (As continued in force, April 2012);
- Inner Moray Firth Local Development Plan 2 (IMFLDP2) (2024);
- Chartered Institute for Archaeologists (2017, updated 2020) 'Standard and Guidance for Historic Environment Desk-Based Assessment';
- SNH & HES (2018) 'Environmental Impact Assessment Handbook';
- HES (2019) 'Designation Policy and Selection Guidance';
- HES (2016) 'Managing Change in the Historic Environment: Setting'
- Planning Advice Note (PAN) 2/2011: Planning and Archaeology; and
- IEMA (2021) 'Principles of Cultural Heritage Impact Assessment'.

9.8.2 The methodology proposed below has been informed by the above and all other relevant industry guidance, and will be agreed, along with any alterations/amendments, through consultation with HES and THC Historic Environment Team in advance.

Baseline Assessment

9.8.3 The desk-based element of the baseline assessment would include the following:

- review of the HES database for information relating to designated heritage assets, including Scheduled Monuments, Listed Buildings, Inventoried Gardens and Designed Landscapes and Inventoried Battlefields;
- review of the Historic Environment Record (HER) data supplied by THC, for information relating to non-designated heritage assets;
- review of web-based resources for other relevant information, e.g., geology, topography, soils, grey literature;
- map regression using available historic cartographic sources;
- review of available Historic Landscape Characterisation data;
- review of aerial photographs of the route corridors (National Collection of Aerial Photography, Edinburgh);

- review of any appropriate geotechnical data including peat probing, borehole and sampling data;
- review of relevant heritage assessments for any nearby developments;
- synthesis of published sources to establish historic landscape and archaeological context and any cultural heritage associations, including data from Canmore (the HES database); and
- place-name analysis and assessment of the intangible cultural heritage of the Study Area.

9.8.4 The baseline assessment would also include consideration of heritage setting; it would identify those cultural heritage receptors, e.g., Scheduled Monuments, within the study area with the potential to be affected by the Proposed Development as a result of change to their setting. Creation of a Zone of Theoretical Visibility (ZTV) will aid the analysis of intervisibility between these receptors and the Proposed Development, to assist in identifying any potential effects. This assessment will be supported by the work undertaken by the LVIA team, including any viewpoints, montages or wirelines produced.

Field Surveys

9.8.5 An archaeological walkover survey would be undertaken to assess the condition, extent and nature of any known receptors and help identify any previously unknown heritage receptors. Additionally, a characterisation of the general ground conditions will be made in reference to potential preservation.

9.8.6 A proportionate level of archaeological field investigation may be required / requested by consultees as appropriate, such as geophysical survey and / or targeted trial trenching. Any such requirements would be informed by the emerging results of the assessment and agreed in advance with the Council's Archaeology Officer.

Assessment of Effects

9.8.7 Assessment of likely direct, indirect and cumulative effects of the Proposed Development on cultural heritage receptors would take into account receptor sensitivity and the likely magnitude of any change/impact, in order to determine the nature and extent of any resulting effects. A determination will then be made as to whether the identified effects are significant for the purposes of EIA.

Mitigation

9.8.8 Mitigation measures would be proposed, where achievable, in order to prevent, reduce, or offset any significant adverse effects, and any residual effects such as might persist following the implementation of proposed mitigation measures would be identified.

9.8.9 Avoidance is the preferred method of mitigating adverse impacts to cultural heritage receptors. In the event that avoidance is not proportionate or possible, a strategy would be developed to minimise any impacts and offset any effects; in relation to any direct physical impacts upon archaeological remains, this would be likely to take the form of a proportionate programme of archaeological recording (preservation by record).

9.9 Summary

9.9.1 Within the Proposed Development, there is the potential for significant direct effects on the designated and non-designated receptors, as well as any undiscovered or buried archaeology. The wider landscape siting of the Proposed Development also presents the potential for significant indirect and setting effects on designated and non-designated receptors. Only indirect effects from dust and vibration can be scoped out during the operation phase of the Proposed Development.

9.9.2 Initial consultation with HES (6th October 2023) in relation to route options highlighted the potential, and specified, receptors that are preliminarily considered likely to suffer significant adverse effects, resulting in issues of national interest. This is noted across numerous route options alongside advisories concerning the careful assessment and siting of infrastructure. Further assessment will

necessarily require ongoing communication and consultation with HES; with this continued consultation, appropriate and robust assessment and mitigation can be developed.

9.9.3 An archaeological walkover survey and setting assessment for the Proposed Development is required to further develop the baseline and inform the impact assessment in relation to direct, indirect and setting impacts to known sensitive receptors.

9.9.4 During this walkover, suitably qualified archaeologists will: assess the Proposed Development's potential for buried archaeology; identify any unknown extant archaeological receptors on the surface; and conduct a field setting assessment.

10. GEOLOGICAL ENVIRONMENT (SOIL, PEAT AND GEOLOGY)

10.1 Introduction

10.1.1 This chapter describes the baseline environment and potential impacts on soil, peat and geology as a result of the Proposed Development. The Study Area for the Geological Environment is defined as the Route as illustrated in the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[98]. The purpose of the assessment will be to:

- Define the peat extent, depth and properties across the Study Area; and
- Assess potential effects on soil, peat and geology.

10.2 Baseline Conditions

General

10.2.1 This section sets out the baseline conditions for each section of the Proposed Development. The following data sources have been reviewed as part of scoping:

- The National Soils Map of Scotland[99];
- The 2016 Carbon and Peatland Map[100];
- The Coal Authority Interactive Map Viewer[101];
- A Zetica Unexploded Ordnance (UXO) Desk Study & Constraints Assessment[102];
- The British Geological Survey (BGS) GeoIndex Superficial Soils Map[103]; and
- The BGS GeoIndex Bedrock Geology Map[104].

10.2.2 The 2016 Carbon and Peatland Map characterises peatland as follows:

- Class 1 Peat: “Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value.”
- Class 2 Peat: “Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas of potentially high conservation value and restoration potential.”
- Class 3 Peat: “Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon-rich soils, with some areas of deep peat.”
- Class 4 Peat: “Area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon-rich soils.”
- Class 5 Peat: “Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat.”

Section A - Spittal to Brora

Soil Types

10.2.3 The National Soils Map of Scotland indicates the following soil types within Section A of the Study Area, from north to south.

- Mineral Gleys;

98 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)

99 Scotland’s Soils (2023) National Soils Map of Scotland [online] Available at: https://map.environment.gov.scot/Soil_maps/?layer=1 (Accessed 22/11/2023)

100 Scotland’s Soils (2023) 2016 Carbon and Peatland Map [online] Available at: https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/ (Accessed 21/12/2023)

101 The Coal Authority (2023) Interactive Map Viewer [online] Available at: https://mapapps2.bgs.ac.uk/coalauthority/home.html (Accessed 22/11/2023)

102 Zetica UXO (2023) UXO Desk Study & Constraints Assessment Document Ref. P13359-23-R1. Published by: Zetica UXO

103 British Geological Society (2023) Superficial Soils Map [online] Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html (Accessed 22/11/2023)

104 British Geological Society (2023) Bedrock Geology Map [online] Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html (Accessed 22/11/2023)

- Peat;
- Peaty Gleys;
- Peaty Podzols; and
- Mineral Podzols.

Peatland

10.2.4 The 2016 Carbon and Peatland Map indicates Class 1, 2, 3, 4 and 5 peatlands within Section A of the Study Area. This section of the Study Area consists of large sections of high priority Class 1 and 2 peatland with isolated areas of Class 3, 4, and 5 peatlands.

Statutory Designations

10.2.5 Section A of the Proposed Development passes through a number of statutory designations relating to peat, including the Shielton Peatlands and the Coire na Beinne Mires SSSI. These peatlands are also designated as SACs named Caithness and Sutherland Peatlands which form part of the Flow Country (an intact and expansive blanket bog system that stretches across Caithness and Sutherland). The Flow Country was inscribed on the World Heritage List to the United Nations Educational, Scientific and Cultural Organisation (UNESCO) as of July 2024.

10.2.6 These same areas are also designated as SPAs and Ramsar Sites.

Coal Mining

10.2.7 The Coal Authority Interactive Map Viewer shows that Section A of the Proposed Development is not within a coal mining reporting area and therefore is not considered to be at risk from coal mining activities.

10.2.8 There is an area that is noted to be a Coal Mining Reporting Area near Brora. This lies outside of the Study Area and is therefore not included in further investigation.

Unexploded Ordnance

10.2.9 The Zetica UXO Desk Study & Constraints Assessment identifies areas of moderate risk within Section A of the Proposed Development.

10.2.10 In December 1939, large areas of north and northwest Scotland were designated as a Protected Area under Defence Regulation No. 13. This included all of Inverness-shire, Ross and Cromarty, and Sutherland, encompassing the northern part of Section A of the Proposed Development. This required those living in or entering the area to hold permits. It also allowed military training and secret military operations to take place.

10.2.11 The regulations changed in March 1942, and the Burgh of Caithness between Banniskirk and Helmsdale was incorporated into the North of Scotland Regulated Area. This enabled military authorities to requisition land within the regulated area for the purpose of military training or operations.

10.2.12 By 1943, a battle school had been established at Helmsdale, encompassing part of Section A of the Proposed Development.

10.2.13 Battle schools were intended to prepare troops for the realities of war by providing a realistic training environment. This included simulated artillery fire, battle drills and troop manoeuvres. The schools predominantly focused on infantry units, particularly at platoon and section level, to ensure that troops could perform effectively in battle under harsh conditions and heavy enemy fire.

10.2.14 There will be a requirement for a qualified Explosive Ordnance Clearance (EOC) Engineer to be present during intrusive surveys within the moderate risk UXO areas to approve all proposed survey locations.

Superficial Soils

10.2.15 The BGS GeoIndex Superficial Soils Map indicates that the following superficial soils are present from north to south in Section A of the Proposed Development:

- Devensian Diamicton Till.
- Peat – Peat is a partially decomposed mass of semi-carbonized vegetation which has grown under waterlogged, anaerobic conditions, usually in bogs or swamps.
- Clay, Silt, Sand and Gravel Alluvium - Alluvium is a general term for clay, silt, sand and gravel. It is the unconsolidated detrital material deposited by a river, stream or other body of running water as a sorted or semi-sorted sediment in the bed of the stream or on its floodplain or delta, or as a cone or fan at the base of a mountain slope. Synonym: alluvial deposits. Normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel. A stronger, desiccated surface zone may be present.
- Gravel, Sand and Silt Glacofluvial Deposits – Glaciofluvial deposits were deposited by meltwater streams. Includes mostly coarse-grained sediments (i.e. sand and gravel) with some finer-grained layers (i.e. clay and silt). Sand and gravel, locally with lenses of silt, clay or organic material.
- Raised Marine Deposits - Variable lithology. Gravel (shingle), sand, silt and clay; commonly charged with organic debris (plant and shell); now above the level of the present shoreline as a result of earth movement or a general fall in sea level; of Devensian age.
- Undifferentiated River Terrace Deposits - Sand and gravel, locally with lenses of silt, clay or peat.
- Glaciofluvial Ice Contact Deposits - Glaciofluvial ice contact deposits consist of stratified sand and gravel and interbedded diamicton deposited by meltwater and ice under (subglacial), within (englacial), and at the margins of, glaciers. Sand and gravel, locally with lenses of silt, clay and organic material. Moundy topography is characteristic, but flat-topped mounds are common.

Bedrock Geology

10.2.16 The BGS GeoIndex Bedrock Geology Map indicates the following bedrock Geology from north to south within Section A of the Proposed Development.

- Spital Flagstone Formation - Siltstone, Mudstone and Sandstone - Sandstone and siltstone with subsidiary mudstone.
- Berriedale Sandstone Formation - Siltstone, Mudstone and Sandstone - Sandstone with subsidiary limestone, mudstone and siltstone and trace breccia.
- Lybster Flagstone Formation - Siltstone, Mudstone and Sandstone.
- Berriedale Sandstone Formation – Sandstone - Sandstone with subsidiary limestone, mudstone and siltstone and trace breccia.
- Ben Dorrery Conglomerate Member - Conglomerate and Feldspathic-Arenite
- Kildonan Psammite Formation - Psammite and Micaceous Psammite - Psammite, siliceous to micaceous, medium-grained. Psammite shows locally tabular and trough cross-bedding. Subordinate layers of quartz and schistose semipelite. Locally very thin (<5 cm) schistose para-amphibolite.
- Helmsdale Granite, Phase 1 - Granite, Porphyritic
- Badbea Breccio-Conglomerate Member - Breccia and Conglomerate - Conglomerate with subsidiary breccia.
- Braemore Mudstone Formation - Mudstone, Siltstone and Sandstone - Mudstone with subsidiary sandstone and siltstone and trace conglomerate and limestone.
- Helmsdale Granite, Phase 2 - Microgranite, Aplitic - Porphyritic granite.

- Langwell Conglomerate Member – Conglomerate.
- Ousdale Arkose Formation – Sandstone - Breccia, conglomerate and sandstone with subsidiary mudstone.
- Ulbster Sandstone Formation – Sandstone - Sandstone with subsidiary conglomerate.

Section B - Brora to Loch Buidhe

Soil Types

10.2.17 The National Soils Map of Scotland indicates the following soil types found along Section B of the Proposed Development, from north to south.

- Peaty Gleys;
- Peat;
- Peaty Podzols;
- Mineral Podzols;
- Alluvial Soils; and
- Brown Soils.

Peatland

10.2.18 The 2016 Carbon and Peatland Map indicates Class 1, 2, 3, 4, and 5 peatlands indicated throughout Section B of the Proposed Development. This section of the Study Area consists of large sections of Class 2 and 5 peatland with isolated areas of Class 1, 3 and 4 peatlands.

Statutory Designations

10.2.19 Section B of the Proposed Development crosses through the Abercross Burn to Kinnauld Geological Conservation Review Site.

10.2.20 This section of the Proposed Development does not pass through any other designated areas relating to soils, peat or geology.

Coal Mining

10.2.21 The Coal Authority Interactive Map Viewer shows that Section B of the Proposed Development is not within a coal mining reporting area and therefore is not considered to be at risk from coal mining activities.

10.2.22 There is an area that is noted to be a Coal Mining Reporting Area near Brora. This lies outside of the Study Area and is therefore not included in further investigation.

Unexploded Ordnance

10.2.23 The Zetica UXO Desk Study & Constraints Assessment does not identify any risk areas within Section B of the Proposed Development as a result of UXO. There is therefore no requirement for UXO precautions when surveying in this area.

Superficial Soils

10.2.24 The BGS GeoIndex Superficial Soils Map indicates the following superficial soils from north to south in Section B of the Proposed Development.

- Devensian Diamicton Till.
- Alluvium Clay, Silt, Sand and Gravel.
- Peat.
- River Terrace Deposits (Undifferentiated) – Gravel, Sand, Silt and Clay – Sand and gravel, locally with lenses of silt, clay or peat.

- Lacustrine Deltaic Deposits – Gravel, Sand and Silt – Lacustrine deltaic deposits comprise a coarsening upward sequence of sediments laid down in a prograding delta at the fluvial-lacustrine boundary as fluvial current velocity is dissipated. The deposits comprise sand, silt, clay, and the remains of brackish water organisms and organic matter. Deltaic deposits can be subdivided in a variety of ways, for example by fluvial, wave and tidal influence.
- Alluvial Fan Deposits – Gravel, Sand, Silt and Clay – Alluvial fan deposits are low, outspread, relatively flat to gently sloping masses of loose rock material, shaped like a fan or segment of a cone. They are deposited by streams at the mouths of tributary valleys onto a plain or broad valley. Synonym: alluvial cone.

Bedrock Geology

10.2.25 The BGS GeoIndex Bedrock Geology Map indicates the following bedrock Geology from north to south within Section B of the Proposed Development.

- Ulbster Sandstone Formation – Sandstone – Sandstone with subsidiary conglomerate.
- Berriedale Sandstone Formation – Sandstone – Sandstone with subsidiary limestone, mudstone and siltstone and trace breccia.
- Loch Coire Formation – Psammite And Semipelite – Psammite, semipelite and pelite, interbanded, gneissose and migmatitic. Quartzo-feldspathic segregations common. Commonly garnetiferous. Some subunits are more psammitic; others more pelitic.
- Langwell Conglomerate Member – Conglomerate.
- Altnaharra Psammite Formation – Psammite and Micaceous Psammite – Siliceous to feldspathic psammite with micaceous psammite, grey to buff; locally with micaceous layers. Gritty psammite occurs in the lower part; higher up in the unit, thin semipelitic beds become more common. Generally, strongly deformed and flaggy ('bed' thickness 5 – 30 cm). In low strain zones, the psammite shows thick beds (0.5 – 5 m): sedimentary structures include channels with pebble lags, planar and trough cross-bedding, slump-like folds, dewatering pipes and oversteepened cross-beds (Krabbendam et al., 2008). Palaeo-currents are to east or NE.
- Altnaharra Psammite Formation – Psammite, Migmatitic – Siliceous to feldspathic psammite with micaceous psammite, grey to buff; locally with micaceous layers. Gritty psammite occurs in the lower part; higher up in the unit, thin semipelitic beds become more common. Generally, strongly deformed and flaggy ('bed' thickness 5 – 30 cm). In low strain zones, the psammite shows thick beds (0.5 – 5 m): sedimentary structures include channels with pebble lags, planar and trough cross-bedding, slump-like folds, dewatering pipes and oversteepened cross-beds (Krabbendam et al., 2008). Palaeo-currents are to east or NE.
- Lewisian Complex – Orthogneiss.

Section C – West of Dornoch

Soil Types

10.2.26 The National Soils Map of Scotland indicates the following soil types found along Section C of the Proposed Development, from north to south.

- Peaty Gleys;
- Peaty Podzols;
- Mineral Podzols;
- Alluvial Soils;

Peatland

10.2.27 The 2016 Carbon and Peatland Map indicates Class 1, 2, 3, 4, and 5 peatlands as well as areas that are not classified as peatlands indicated throughout Section C of the Proposed Development. This

section of the Study Area consists of a large area of unclassified soils, with a significant amount of Class 2 and 5 peatland. There are also isolated areas of Class 1, 3 and 4 peatlands.

Statutory Designations

10.2.28 Section C of the Proposed Development does not pass through any designated areas relating to soils, peat or geology.

Coal Mining

10.2.29 The Coal Authority Interactive Map Viewer shows that Section C of the Proposed Development is not within a coal mining reporting area and therefore is not considered to be at risk from coal mining activities.

Unexploded Ordnance

10.2.30 The Zetica UXO Desk Study & Constraints Assessment does not identify any risk areas within Section C of the Proposed Development as a result of UXO. There is therefore no requirement for UXO precautions when surveying in this area.

Superficial Soils

10.2.31 The BGS GeoIndex Superficial Soils Map indicates the following superficial soils from north to south within Section C of the Proposed Development.

- Till And Morainic Deposits (Undifferentiated) - Diamicton, gravel and sand.
- Peat.
- River Terrace Deposits (Undifferentiated) - Gravel, Sand and Silt.
- Alluvial Fan Deposits - Gravel, Sand, Silt and Clay.
- Raised Marine Beach Deposits, Late Devensian - Gravel, Sand and Silt - Gravel and sand, commonly silty. Gravel typically cobble grade, poorly sorted, clast supported with subangular to rounded clasts. Sand mainly medium-grained.
- Alluvium Clay, Silt, Sand and Gravel.
- Raised marine beach deposits, late Devensian - Gravel and sand, commonly silty. Gravel typically cobble grade, poorly sorted, clast supported with subangular to rounded clasts. Sand mainly medium-grained.

Bedrock Geology

10.2.32 The BGS GeoIndex Bedrock Geology Map indicates the following bedrock Geology from north to south in Section C of the Proposed Development.

- Altnaharra Psammite Formation - Psammite and Micaceous Psammite.
- Ach'uaine Cluster - Meladiorite, Hornblende - Hornblende meladiorite and trace olivine-hornblendite and ultramafic-rock.

Section D - Dornoch to Dingwall

Soil Types

10.2.33 The National Soils Map of Scotland indicates the following soil types found along Section D of the Proposed Development, from north to south.

- Peaty Gleys;
- Mineral Podzols;
- Alluvial Soils;
- Brown Soils;
- Peat;

- Mineral Gleys; and
- Peaty Podzols.

Peatland

10.2.34 The 2016 Carbon and Peatland Map indicates Class 1, 2, 3, 4, and 5 peatlands as well as areas that are not classified as peatlands indicated throughout Section D of the Proposed Development. This section of the Study Area consists mostly of unclassified soils, with a significant amount of Class 5 peatland. There are also isolated areas of Class 1, 2, 3 and 4 peatlands throughout the Section.

Statutory Designations

1.1.1 Section D of the Proposed Development does not pass through any designated areas relating to soils, peat or geology.

Coal Mining

10.2.35 The Coal Authority Interactive Map Viewer shows that Section D of the Proposed Development is not within a coal mining reporting area and therefore is not considered to be at risk from coal mining activities.

Unexploded Ordnance

10.2.36 The Zetica UXO Desk Study & Constraints Assessment identifies areas of high and low risk within Section D of the Proposed Development relating to the Loch Glass/Alness range.

10.2.37 Records indicate that gunnery practice took place in Glen Glass, approximately 0.5 km west of the Study Area while military training, small arms training and tank training are all recorded around the area of Strathpeffer, at the southern extent of Section D of the Proposed Development.

10.2.38 There will be a requirement for a qualified EOC Engineer to be present during intrusive surveys within the moderate risk UXO areas to approve all proposed survey locations.

Superficial Soils

10.2.39 The BGS GeoIndex Superficial Soils Map indicates the following superficial soils from north to south in Section D of the Proposed Development.

- Till And Morainic Deposits (Undifferentiated) - Diamicton, Sand and Gravel.
- Glaciofluvial Sheet Deposits - Gravel, Sand and Silt - Sand and gravel, locally with lenses of silt, clay or organic material; characteristic 'sandur' (sheet) and valley train form; of glaciofluvial origin.
- River Terrace Deposits (Undifferentiated) - Gravel, Sand, Silt and Clay - Sand and gravel, locally with lenses of silt, clay or peat.
- Alluvium Clay, Silt, Sand and Gravel.
- Peat.
- Glaciofluvial Deposits (Gravel, Sand, and Silt) - Glaciofluvial deposits were deposited by meltwater streams. Includes mostly coarse-grained sediments (i.e. sand and gravel) with some finer-grained layers (i.e. clay and silt). Sand and gravel, locally with lenses of silt, clay or organic material.
- Till, Devensian - Diamicton
- Raised Beach Deposits, 2 - Gravel, Sand And Silt - Raised beach deposits, 2 is older than Raised beach deposits, 1 in the same map area. Shingle, sand, silt and clay; may be bedded or chaotic; beach deposits may be in the form of dunes, sheets or banks; now above the level of the present shoreline as a result of earth movement or a general fall in sea level.

Bedrock Geology

10.2.40 The BGS GeoIndex Bedrock Geology Map indicates the following bedrock Geology from north to south in Section D of the Proposed Development.

- Altnaharra Psammite Formation - Psammite And Micaceous Psammite.
- Fearn Pluton – Granite - Biotite monzogranite and trace granite, microgranite and pegmatite.
- Ben Wyvis Pelite Formation - Pelite And Semipelite - Coarse pelitic gneiss, garnetiferous, locally migmatitic, with gneissose semipelite and psammite. Quartzite occurs locally. Calcsilicate bands are common within psammite.
- Braemore Mudstone Formation - Sandstone, Conglomerate And [Subordinate] Argillaceous Rocks - Mudstone with subsidiary sandstone and siltstone and trace conglomerate and limestone.
- Ousdale Arkose Formation - Breccia and Sandstone, Interbedded - Breccia, conglomerate and sandstone with subsidiary mudstone.
- Cnoc Fyrish Conglomerate Formation – Conglomerate - Conglomerate and sandstone.

Section E - Dingwall to Beauly

Soil Types

10.2.41 The National Soils Map of Scotland indicates the following soil types found along Section E of the Proposed Development, from north to south.

- Brown Soils;
- Mineral Podzols;
- Alluvial Soils;
- Montane Soils; and
- Peaty Podzols.

10.2.42 The majority of this section of the Proposed Development consists of Mineral Podzols.

Peatland

10.2.43 The 2016 Carbon and Peatland Map indicates that the majority of Section E of the Proposed Development is not classified as peatland, with only isolated areas of Class 1, 2 and 5 peatlands.

Statutory Designations

10.2.44 Section E of the Proposed Development does not pass through any designated areas relating to soils, peat or geology.

Coal Mining

10.2.45 The Coal Authority Interactive Map Viewer shows that Section E of the Proposed Development is not within a coal mining reporting area and therefore is not considered to be at risk from coal mining activities.

Unexploded Ordnance

10.2.46 The Zetica UXO Desk Study & Constraints Assessment identifies areas of high, moderate and low risk within Section E of the Proposed Development relating to the Glenorrin range.

10.2.47 During World War II, a military training range was established at Glenorrin, encompassing part of the Study Area.

10.2.48 An Air Ministry (AM) map dating from July 1944 describes the area as a British Army firing range and delineates a ‘Restricted Flying’ area. However, other than grenade training at Ruttle Wood, no positive evidence of military training within the Glenorrin range has been found. It is considered likely

that the 'Restricted Flying' area represents a safety buffer, larger than the actual area of land used for training.

10.2.49 It is also considered likely that training would have been focused on rural heathland and mountains, where conditions were more suitable for simulating battle conditions.

10.2.50 There will be a requirement for a qualified EOC Engineer to be present during intrusive surveys within the moderate risk UXO areas to approve all proposed survey locations.

Superficial Soils

10.2.51 The BGS GeoIndex Superficial Soils Map indicates the following superficial soils from north to south in Section E of the Proposed Development.

- River Terrace Deposits (Undifferentiated) - Gravel, Sand, Silt and Clay - Sand and gravel, locally with lenses of silt, clay or peat.
- Alluvium - Clay, Silt, Sand and Gravel.
- Raised Marine Beach Deposits, Late Devensian - Gravel, Sand, Silt and Clay - Gravel and sand, commonly silty. Gravel typically cobble grade, poorly sorted, clast supported with subangular to rounded clasts. Sand mainly medium-grained.
- Till, Devensian – Diamicton.
- Peat.
- Hummocky (Moundy) Glacial Deposits - Diamicton, Sand and Gravel - Lithologically diverse and complex glacial deposits that have characteristic moundy topographic form. Composed of rock debris, clayey till and poorly- to well-stratified sand and gravel.
- Glaciofluvial Deposits - Gravel, Sand and Silt - Glaciofluvial deposits were deposited by meltwater streams. Includes mostly coarse-grained sediments (i.e. sand and gravel) with some finer-grained layers (i.e. clay and silt). Sand and gravel, locally with lenses of silt, clay or organic material.

Bedrock Geology

10.2.52 The BGS GeoIndex Bedrock Geology Map indicates the following bedrock Geology from north to south in Section E of the Proposed Development.

- Braemore Mudstone Formation - Mudstone, Sandstone and Limestone - Mudstone with subsidiary sandstone and siltstone and trace conglomerate and limestone.
- Ousdale Arkose Formation - Breccia and Conglomerate - Breccia, conglomerate and sandstone with subsidiary mudstone.
- Achnaconeran Striped Formation - Psammite and Semipelite - Psammite and semipelite, interbanded. Semipelite is muscovite-rich and locally migmatitic.
- Tarvie Psammite Formation – Psammite - Predominantly psammite, thin-bedded, siliceous to micaceous. Local, thin semipelite beds are muscovite-rich and locally migmatitic. Large quartzite lenses occur, in particular near the base. Tends to become more micaceous to the NE. Psammite is generally fine-grained. Locally well-developed cross-bedding, in places showing herring-bone cross-bedding, and symmetric ripple marks.

10.3 Consultation Responses and Considerations

10.3.1 Consultation on the Preferred Route raised some issues and concerns relating to the geological environment. These concerns are listed below in order to show where in the EIA process the concerns will be addressed.

- Concerns were raised about damage to peatland and forestry habitats and the risk of loss of biodiversity, including newly created woodland plantation schemes. The potential for damage to

peatland will be assessed through extensive desk study and subsequent peat depth and condition surveys. Development in areas of peat depths greater than 1.0 m will be minimised as far as possible and peat will be reused for habitat reinstatement or restoration where this is determined to be possible. This will be further evaluated in the outline Peat Management Plan that will be prepared as part of the EIA.

- Numerous comments were made on the need for peat depth and habitat surveys that should be undertaken for the Proposed Development. These surveys will take place following consultation on the extents and methodology for the surveys. These surveys will create a better understanding of the peat habitat which will be essential in determining the potential environmental impacts of the Proposed Alignment and access tracks.

10.4 Sensitive Receptors

10.4.1 The following receptors within the Study Area are classed as sensitive:

- Highly sensitive soil types and associated land use (e.g. peat/blanket bog);
- Highly sensitive soils that have peat deposits (greater than 1.0 m depths);
- Class 1 or 2 priority peatland, carbon rich and peaty soils (there are sections of Class 1 and 2 peatlands within the Study Area); and
- The Flow Country[105].

10.5 Issues Scoped Out

10.5.1 Risks relating to historic coal mining activities are scoped out of the assessment due to the lack of coal mining in the area. No other issues are scoped out of the soil, peat and geology assessment.

10.6 Potential Significant Effects

Construction

Peat Stability

10.6.1 Peat instability is generally the result of a combination of causative factors. Several construction activities have the potential to increase the likelihood of peat slides in areas where peat is present at a sufficient depth and where gradients are sufficiently steep to result in a peat slide event. Peat stability is to be assessed within the Peat Slide Risk Assessment (PSRA). The PSRA will be supplemented by peat probing data and desktop assessments in order to evaluate the stability of the substrate within the Study Area.

Disturbance of Deep Peat

10.6.2 If construction activities take place in areas with peat, then peat will be disturbed. The Outline Peat Management Plan (oPMP) will evaluate areas that have deep peat greater than 1m in depth and this will inform the design in order to minimise the disturbance of deep peat.

Loss and Compaction of Peat and Soils

10.6.3 The loss and compaction of peat and soils could occur should development take place in areas with peat. Even with the avoidance of peat, construction activities could lead to the compaction of soils. This can reduce soil permeability and increase run-off and erosion. This will be assessed and mitigated within the oPMP.

Excavated Peat

10.6.4 If peat is excavated it will need to be reused and there may be areas in the Study Area that will require restoration. The reuse and restoration of peatland will be addressed in the oPMP.

[105] The Flow Country (2023) The Flow Country [online] Available at: https://www.theflowcountry.org.uk/ (Accessed 22/11/2023)

Contaminated Land

10.6.5 There is potential for contaminated land, associated with former land uses including military training areas, to be present within Sections A, D and E. Where present, this could pose a risk to construction workers. The potential for contaminated land in these sections will be assessed within the EIAR chapter on peat, geology and soils.

10.6.6 There is not considered to be a risk from contaminated land in Sections B and C of the Route Corridor; therefore, further assessment relating to contaminated land in these sections has been scoped out of the EIAR chapter on peat, geology and soils.

Operational and Maintenance Effects

Peat Stability

10.6.7 Peat instability is generally the result of a combination of causative factors. There are maintenance activities that have the potential to increase the likelihood of peat slides in areas where peat is present at a sufficient depth and where gradients are sufficiently steep to result in a peat slide event. Peat Stability is to be assessed within the PSRA. The PSRA will be supplemented by peat probing data and desktop assessments in order to evaluate the stability of the substrate within the Study Area.

10.7 Assessment Methodology

10.7.1 The assessment methodology will be informed by experience of carrying out such assessments for a range of wind farm and other renewable energy and electrical transmission developments. The assessment will also be informed by knowledge of the geology and peat characteristics in Scotland and cognisance of good practice.

Scoping

Sensitivity of Receptors

10.7.2 The sensitivity of a receiving environment is defined as its ability to absorb an effect without noticeable change and can be classified as either very high, high, medium, low, or negligible. The receptor classification is determined by a series of factors, including: the nature and extent of peat, associated habitats, soil characteristics, geology, and land use. Peat soils of high moisture content, such as those found in blanket bog, are considered to be highly sensitive receptors.

1.1.2 **Table 10.1** details the different classifications of receptor sensitivity that are used to inform the assessment of the geology and peat present within the Study Area, assessing whether the effects would be significant under the EIA regulations.

Table 10.1: Framework for Determining Sensitivity of Receptors

Sensitivity of Receptor	Definition
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance. This includes very deep peat, where peat depths are >3.0 m.
High	Soil types and associated land uses that are highly sensitive (e.g. peat/blanket bog). These include: Class 1 or 2 priority peatland, carbon-rich and peaty soils, which cover >20% of the Project area; Deep peat (>1.0 m), which is present in areas of blanket bog; Nationally important carbon rich soils, which are also present; Areas containing geological or geomorphological features considered to be of national importance (e.g. geological SSSIs); and

Sensitivity of Receptor	Definition
	Receptors containing areas of regionally important economic mineral deposits.
Medium	Soil types and associated land uses that are moderately sensitive (e.g. commercial forestry). These include: Class 1 or 2 priority peatland, carbon-rich and peaty soils, which cover <20% of the Development Area; Class 3 and 5 peatland areas, carbon rich and peaty soils; Deep peat (>1.0 m) that is present outside of areas of blanket bog; Receptors containing areas of locally important economic mineral deposits; and Areas containing geological features of designated regional importance, including Regionally Important Geological/geomorphological Sites (RIGS), considered worthy of protection for their historic or aesthetic importance.
Low	Geological features or geology not protected and not considered worthy of specific protection. Soil types and associated land uses not sensitive to change in hydrological regime (e.g. intensive grazing); Receptors containing Class -2, -1, 0 and 4 non-peatland areas, with no carbon-rich and/or peaty soils.
Negligible	The receptor is resistant to change and is of little environmental value.

Magnitude of Impact

10.7.3 The magnitude of potential impacts on geology and peat will be identified through consideration of the Proposed Development, the degree of change to baseline conditions predicted as a result of the Proposed Development, the duration and reversibility of an effect, and professional judgement, best practice guidance and legislation listed in paragraph 10.7.22 below. The criteria for assessing the magnitude of an effect are presented in **Table 10.2**.

Table 10.2: Framework for Determining Magnitude of Impact

Sensitivity of Receptor	Definition
High	Major or total loss of or alteration to peatland resource such that post development characteristics or quality will be fundamentally or irreversibly changed. Long term/permanent change to human or environmental health. Catastrophic failure of site infrastructure due to ground instability. Long term/permanent change to baseline resource. Major or total loss of a geological site or mineral deposit, where the value of the site would be severely affected.
Medium	Loss of, or alteration to the baseline resource such that post development characteristics or quality will be partially changed. Mid-term/permanent change to human or environmental health. Ground failure that requires remediation but does not cause catastrophic failure of site infrastructure. Mid-term/permanent change to baseline resource. Partial loss of a geological site or mineral deposit, with major effects to the settings, or where the value of the site would be affected.
Low	Small loss of soils or peatland, or where soils will be disturbed but the value not impacted. Short-term change to human or environmental health. Ground settlement/subsidence that does not adversely affect site infrastructure or require remedial action.

Sensitivity of Receptor	Definition
	Short-term change to baseline resource. Small effect on a geological site or mineral deposit, such that the value of the site would not be affected.
Negligible	Minimal or no change to soils or peatland deposits. Minimal or no change to human or environmental health. Minimal or no change to ground stability. A very slight change from the baseline conditions. The change is barely distinguishable, and approximates to the 'no-change' situation. Minimal or no change to a geological site or mineral deposit.

Significance of Effect

10.7.4 The sensitivity of the receptor and the magnitude of the predicted effects will be used as a guide, in addition to professional judgement, to predict the significance of the likely effects on the geology and peat resource as a result of the Proposed Development. **Table 10.3** summarises guideline criteria for assessing the significance of effects.

Table 10.3: Framework for Assessment of the Significance of Effects

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

Further Assessment

Desk Study

10.7.5 The Proposed Development passes through sensitive peatland habitat, including the Caithness and Sutherland Peatlands SSSI and SAC designations which also form part of the Flow Country World Heritage Site.

10.7.6 The Proposed Development measures approximately 170 km in length, so it is not practical or necessary to fully adopt the peat probing methodology, outlined in the Scottish Government guidance[106], along the entirety of the route. It is proposed that an in-depth desk study and 'ground truthing' exercise be undertaken in order to identify areas where peat is likely to be present and to focus the scope of the peat probing survey. Ground truthing will be done to ensure that none of the areas excluded by the desk study have peat deposits. This will be followed by peat probing along the OHL route in the areas identified to be sensitive by the desk study and more intense probing at the proposed tower locations.

10.7.7 The desk study will form a crucial part of the assessment with an opportunity to refine the extent of the peat probing survey through scrutiny of publicly available resources and site-specific factors. The

[106] Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only [Online]. Available at: Guidance+on+developments+on+peatland+-+peatland+survey+-+2017.pdf (www.gov.scot) (Accessed 22/11/2023)

following sources will be reviewed during the desk study, with the high sensitivity criteria resulting in peat probing being required included in brackets:

- BGS records of Superficial Geology (any area classified as Peat will be probed);
- National Soils Map of Scotland (any area classified as Peat, Peaty Gleys or Peaty Podzols will be probed);
- 2016 Carbon and Peatland Map (all areas of Class 1 and Class 2 Peat will be probed);
- SSSIs and SACs with peatland as a qualifying feature (all of these areas will be probed);
- Flow Country World Heritage Site (all sections within this area will be probed);
- Aerial Imagery (areas that visibly have no peat forming vegetation will be discounted from probing); and
- Terrain and Slope Data (the maximum slope angle listed in Scottish Government guidance is 32˚; gradients in excess of this will be discounted, subject to verification through ground truthing, due to the limited likelihood of peat deposits on these gradients).

10.7.8 The desk study will result in certain sections of the alignment being classified as requiring probing, with the remaining areas requiring further desktop assessment to determine the requirement for probing. This will include analysis of remote sensing satellite imagery at 50 cm resolution to evaluate the vegetation and land uses.

10.7.9 Areas that are used for grazing or have no peat forming vegetation will be excluded from the peat probing survey, while any areas with noticeable peat or peat forming vegetation will be included in the survey, in addition to the high sensitivity areas.

Ground Truthing

10.7.10 To justify this assessment approach, peat probing will be undertaken in sections of the alignment that are determined as not requiring probing to confirm the absence or presence of peat, to verify the accuracy of the desk study.

10.7.11 Following ground truthing, it is anticipated that no further probing will be undertaken in those areas identified during the desktop assessment as having no evidence of peat forming vegetation.

Peat Probing

10.7.12 Following the desk study and ground truthing, the sections of the Proposed Development where peat is identified as potentially present will be probed at 100 m intervals, with typical offsets at 100 m on either side of the alignment (where practical) to satisfy Phase 1 probing requirements and to cover the LOD.

10.7.13 At proposed transmission tower locations, a crosshair of 100 m x 100 m from the centre point of the proposed tower with probes at 10 m centres is proposed to provide peat depth information at proposed tower bases with allowance for potential micrositing.

10.7.14 Proposed tracks within areas identified as requiring peat probing will be probed at 50 m intervals with offsets at 25 m on either side of the proposed track. A further probe at a 50 m offset from the proposed track centreline will be undertaken to inform access track site selection and identify any areas of shallower peat. This includes proposed tracks in cut or fill, tracks to be floated and upgrades to existing tracks; centreline probes will not be undertaken along existing tracks. All other Site infrastructure, including construction compounds, will be probed using a 10 m x 10 m grid.

10.7.15 Areas where peat has not been identified as being present through the desk study and ground truthing will not be subject to peat probing, including any proposed towers and access tracks in these areas.

Peat Slide Risk Assessment (PSRA)

10.7.16 A PSRA will be undertaken in accordance with the Scottish Government guidance 'Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Second Edition)'[107] along with full consultation with the relevant consultees.

10.7.17 The PSRA will contain detailed analysis and reporting on the 'design freeze' and will include a hazard and slope stability assessment and preliminary peat management recommendations.

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

World Heritage Site Toolkit

10.7.19 An assessment of "The Flow Country", United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site (WHS) will be undertaken, using THC's WHS toolkit.

Peatland Carbon Emission Assessment

10.7.20 A peatland carbon emission assessment will be undertaken in line with the Peatland Carbon Code[108] and the NPF4 Policy 5 to assess the potential effects of the Proposed Development through peatland disturbance. This assessment will utilise the peat depth and condition survey data (probing and coring) collected in accordance with Scottish Government peat survey guidance.

Outline Peat Management Plan (oPMP)

10.7.21 An oPMP will accompany the EIA Report which will include an estimation of the volumes of peat excavation and re-use. This will be based on the approximate infrastructure dimensions and anticipated re-use streams. The oPMP will:

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

Guidance and Standards

10.7.22 The following guidance and standards were used in the preparation of this Section, and will be used throughout the peat, geology and soils assessment:

- Scottish Government (2023) National Planning Framework 4 (NPF4).[109]
- NatureScot (formerly Scottish Natural Heritage (SNH)) (2019) 4th Edition, Good Practice During Wind Farm Construction.[110]

[107] Scottish Government (2017) Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Second Edition) [Online] Available at: Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (www.gov.scot) (Accessed 11/22/2023)

[108] International Union for the Conservation of Nature (ICUN) (2023). Peatland Carbon Code. Available at: https://www.iucn-ukpeatlandprogramme.org/peatland-code-0

[109] Scottish Government (2023) National Planning Framework 4. [Online] Available at: National Planning Framework 4 - gov.scot (www.gov.scot) (Accessed 11/22/2023)

[110] NatureScot (2019). Guidance – Good Practice During Wind Farm Construction. 4th Edition. [Online] Available at: Guidance - Good practice during Wind Farm construction | NatureScot (Accessed 11/22/2023)

- The Scottish Government (2017) Peat Landslide Hazard and Risk Assessments – Best Practice Guide for Proposed Electricity Generation Developments.[111]
- Scottish Government, SNH, Scottish Environment Protection Agency (SEPA) (2017) Peatland Guidance on Development on Peatland, on-line-version-only.[112]
- SEPA (2012) Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and Minimisation of Waste.[113]
- SEPA (2017) Developments on Peat and Off-Site Uses of Waste Peat.[114]
- NatureScot (2023) Advising on peatland, carbon-rich soils and priority peatland habitats in development management[115].
- The Scottish Government (2009) The Scottish Soil Framework. [116]
- The Scottish Office (1996) Planning Advice Note (PAN) 50 – Controlling the Environmental Effects of Surface Mineral Workings.[117]
- The Construction Industry Research and Information Association (CIRIA) (2015) Environmental Good Practice on Site (C741).[118]

10.8 Mitigation

10.8.1 The Proposed Development will firstly undertake mitigation by design through the implementation of an iterative design process to ensure the appropriate siting of infrastructure in order to protect the Soils, Peat and Geology receptors identified within this chapter.

10.8.2 Construction good practice will be followed throughout the construction process and more detailed mitigation measures relating to Soils, Peat and Geology will be identified and discussed within the EIA Chapter.

10.8.3 The main significant effects that will require mitigation will be peat disturbance and excavation, which will be managed through the effective implementation of a PMP during the pre-construction and construction phases.

10.9 Summary

10.9.1 As outlined in **Section 10.6**, an assessment of peat stability, disturbance of deep peat, loss and compaction of peat and soils, excavated peat and contaminated land will be included in the EIA Report. An assessment of “The Flow Country”, UNESCO WHS will also be undertaken, using THC’s WHS toolkit.

10.9.2 Risks relating to historic coal mining activities are scoped out of the assessment due to the lack of coal mining in the area. No other issues are scoped out of the soil, peat and geology assessment.

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111 Scottish Government (2017) Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Second Edition) [Online] Available at: Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (www.gov.scot) (Accessed 11/22/2023)

112 Scottish Government, Scottish National Heritage, Scottish Environment Protection Agency (2017) Peatland Guidance on Development on Peatland. [Online] Available at: Guidance+on+developments+on+peatland+-+peatland+survey+-+2017.pdf (www.gov.scot) (Accessed 11/22/2023)

113 Scottish Environment Protection Agency (2012). Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and Minimisation of Waste [Online] Available at: Assessment of peat volumes, reuse of excavated peat and minimisation of waste: guidance - gov.scot (www.gov.scot) (Accessed 11/22/2023)

114 Scottish Environment Protection Agency (2017) Developments on Peat and Off-Site Uses of Waste Peat [Online] Available at: wst-g-052-developments-on-peat-and-off-site-uses-of-waste-peat.pdf (sepa.org.uk) (Accessed 18/05/2023)

115 NatureScot (2023) Advising on peatland, carbon-rich souls and priority peatland habitats in development management [Online] Available at: Advising on peatland, carbon-rich soils and priority peatland habitats in development management | NatureScot (Accessed 01/02/2024)

116 Scottish Government (2009). The Scottish Soil Framework. [Online] Available at: The Scottish Soil Framework (fao.org) (Accessed 11/22/2023)

117 Scottish Government (1996). Planning Advice Note 50: controlling the environmental effects of surface mineral workings [Online] Available at: Planning Advice Note 50: controlling the environmental effects of surface mineral workings - gov.scot (www.gov.scot) (Accessed 11/22/2023)

118 The Construction Industry Research and Information Association (CIRIA) (2015) Environmental Good Practice on Site (C741).

11. WATER ENVIRONMENT (HYDROLOGY AND HYDROGEOLOGY)

11.1 Introduction

11.1.1 This chapter describes the baseline water environment and potential effects relating to hydrology and hydrogeology in relation to the construction and operation of the Proposed Development.

11.1.2 The Hydrology and Hydrogeology Study Area for this scoping chapter is shown on the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[119] and is based on the identification of surface water and groundwater features within 1 km of the Proposed Development. Where necessary, the Study Area has been extended to include specific features that could be affected by the Proposed Development. Where an extension to the Study Area is made this is identified in **Section 14.1.1** and on the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[120].

11.2 Baseline

General

11.2.1 The following sets out the baseline conditions for the Proposed Development. A route-wide description of groundwater resources and GWDTEs is provided first, followed by section-specific descriptions of surface water resources, flood risk and statutory designated sites. Reference should also be made to the Spittal – Loch Buidhe – Beauly 400 kV Connection Web Viewer[121].

11.2.2 The following data sources have been reviewed as part of scoping:

- The Ordnance Survey (OS) 1:50,000 (Digital);
- OS 1:25,000 Map (Digital);
- SEPA Flood Map 2019[122];
- Scotland's Environment web-based maps[123];
- SEPA Water Environment Hub[124];
- THC's open data Private Water Supply mapping[125]; and
- BGS GeoIndex onshore geology viewer[126].

11.2.3 A review of NatureScot GIS datasets available through the Scotland's Environment mapping service[127] was used to identify statutory designated sites related to the water environment within the Study Area. Statutory designations include those of international importance e.g., Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Wetlands of International Importance (Ramsar); those of national importance, such as Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs); and those of local importance i.e., Local Nature Reserves (LNRs).

11.2.4 Consultation with Scottish Water in ongoing in relation to assets and drinking water protected areas.

119 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)
120 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)
121 0629430 - Beauly to Loch Buidhe to Spittal OHL - Scoping - Web App (arcgis.com)
122 SEPA (2019) *SEPA Flood Maps*. Available online at: https://map.sepa.org.uk/floodmaps (Accessed 16/01/2024)
123 Scotland's Environment (various) *Scotland's Environment Map.* Available online at: https://www.environment.gov.scot/maps/scotlands-environment-map/ (Accessed 16/01/2024)
124 SEPA (2021) *Water Environment Hub*. Available online at: https://informatics.sepa.org.uk/RBMP3/ (Accessed 16/01/2024)
125 The Highland Council (2023) Private Water Supplies. Available online at: https://map-highland.opendata.arcgis.com/datasets/Highland::private-water-supplies/about (Accessed 16/01/2024)
126 BGS (2023) *GeoIndex (onshore).* Available online at: https://www.bgs.ac.uk/map-viewers/geoindex-onshore/ (Accessed 16/01/2024)
127 NatureScot. (2023) *SiteLink*. Available online at: https://sitelink.nature.scot/map. (Accessed 23/05/2023)

Route-wide

Groundwater

11.2.5 The soils, superficial deposits and bedrock geology beneath the Proposed Development are detailed in **Chapter 10: Geological Environment**.

11.2.6 Section A of the Proposed Development (from Spittal to Brora) is mainly located upon the Caithness groundwater body (ID: 150692). The southern portion of Section A is located upon the Northern Highlands groundwater body (ID: 150701). This is also partially located upon the Brora groundwater body (ID: 150703). Section B (from Brora to Loch Buidhe) is mainly located upon the Northern Highlands groundwater body, with its northernmost length located upon the Brora groundwater body. Section C (West of Dornoch) is located upon the Northern Highlands groundwater body. Section D of the Proposed Development (from Dornoch to Dingwall) is mainly located upon the Northern Highlands groundwater body (described above). However, the southernmost length is situated upon the Invergordon groundwater body (ID: 150679) and the Muir of Ord groundwater body (ID: 150619). Parts of Section D are also situated upon the Northern Highlands groundwater body. Section E (from Dingwall to Beauly) is located upon three groundwater bodies: the Muir of Ord groundwater body to the east, the Northern Highlands groundwater body to the west, and the Strathconan and Muir of Ord Sand and Gravel groundwater body (ID: 150790), which follows the course of the Rivere Conon and its tributaries.

11.2.7 The Caithness groundwater body covers an area of 1,339.1 km^2 and is reported to have an overall current and future status of Good[128] under the Water Framework Directive (WFD). The aquifer typology is recorded as Old Red Sandstone North with a dominant fracture (minor intergranular) flow typology, resulting in low to high aquifer productivity.

11.2.8 The Northern Highlands groundwater body covers an area of 9,382.3 km^2 and is reported to have an overall current and future status of Good under the WFD. The aquifer typology is recorded as Precambrian North with a dominant fracture flow typology, resulting in very low to low aquifer productivity.

11.2.9 The Brora groundwater body covers an area of 154.4 km2 and is reported to have an overall current and future status of Good under the WFD. The aquifer typology is recorded as Pre Old Red Sandstone North with a dominant fracture (minor intergranular) flow typology, resulting in low to high aquifer productivity.

11.2.10 The Invergordon groundwater body covers an area of 520.0 km2 and is reported to have an overall current and future status of Good under the WFD. The aquifer typology is recorded as Old Red Sandstone North with a dominant fracture (minor intergranular) flow typology, resulting in low to high aquifer productivity.

11.2.11 The Muir of Ord groundwater body covers an area of 158.3 km2 and is reported to have an overall current and future status of Good under the WFD. The aquifer typology is recorded as Old Red Sandstone North with a dominant fracture (minor intergranular) flow typology, resulting in low to high aquifer productivity.

11.2.12 The Strathconon and Muir of Ord Sand and Gravel groundwater body covers an area of 51.4 km2 and is reported to have an overall current and future status of Good under the WFD. The aquifer typology is recorded as superficial aquifers with a dominant intergranular flow typology, resulting in moderate to high aquifer productivity.

[128] SEPA (2021) *Water Environment Hub*. Available online at: https://informatics.sepa.org.uk/RBMP3/ (Accessed 16/01/2024

Groundwater Dependent Terrestrial Ecosystems

11.2.13 An Extended Phase 1 Habitat Survey and corresponding NVC Survey will be undertaken as part of the EIA. The location, type and extent of the GWDTEs will be determined through the NVC survey, which inform the assessment of the hydrological function of the GWDTEs, in accordance with SEPA Land Use Planning System Guidance Note 31[129].

11.2.14 An assessment of GWDTEs will be included within the EIA Ecology Chapter and will be informed by both NVC data and a separate hydrogeological assessment. The assessment will consider the condition of each GWDTE and if it is truly groundwater dependent or ombrotrophic (rainwater fed). Measures to safeguard groundwater-fed communities will be compliant with SEPA guidance.

11.2.15 SEPA Land Use Planning System SEPA Guidance Note 31 requires that any GWDTE within 250m of any excavation that exceeds 1m in depth is assessed to determine whether the construction of below ground works may change the quantity or quality of the groundwater supplying the receptor. On this basis, an initial screening assessment will be undertaken to establish a radius of influence within which groundwater receptors and GWDTEs could be affected by the Proposed Development.

11.2.16 **Chapter 10: Geological Environment** indicates the Proposed Development is underlain by various superficial despots. Groundwater radius of influence calculations using Sichardt's Formula will be completed for each section of the Proposed Development based on the underlying geological deposits, with hydraulic connectivity rates derived from Lewis (1989) Water in Earth Science Mapping for planning, development and conservation[130]. The formula below will identify the radius of influence of excavations on groundwater receptors, including GWDTEs:

$$R = 3000 \times Sw \times \sqrt{K}$$

Where:

- R = Radius of Influence (m)
- Sw = Maximum depth of excavation (m)
- K = Hydraulic conductivity of superficial deposits (m/s)

Section A - Spittal to Brora

Surface Water

11.2.17 Section A of the Proposed Development has the potential to cross approximately 62 watercourses across seven catchments, depending on the final route alignment and micrositing. OS mapping and aerial photography have been used to distinguish between those watercourses that have a natural plan form and geometry, and are therefore of higher value, and those which are artificial drainage ditches, of lesser value. The crossings have also been compared with SEPA Flood Hazard and Risk Maps to identify where areas of potential flood risk are likely to be encountered. **Table 11.1** below provides a summary of the watercourses crossed by Section A of the Proposed Development, with watercourses at high likelihood of flooding from rivers, the sea or other surface water bodies shown in bold font. A summary of the flood risk from all sources across Section A is included in **Table 11.4**.

[129] SEPA. (2014) *Land Use Planning System SEPA Guidance Note 31*, accessed 23/05/2023 [Online], <https://www.sepa.org.uk/media/143868/lupsgu31_planning_guidance_on_groundwater_abstractions.pdf>.
[130] Lewis, M A. 1989. 'Water' in Earth Science Mapping for planning, development and conservation. McCall, J, and Marker, B; Graham and Trotman

Table 11.1: Watercourse and Surface Water Body Crossings (Section A – Spittal to Brora)

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
A1	Unnamed Drains	Drainage ditch	None	None	River Thurso / Wick River	None	Mosaiced across Section A north of ND2076752650
A2	Burn of Halkirk	Drainage ditch	None	None	River Thurso	None	ND1613657188
A3	**Black Burn**	**Modified natural channel**	**High likelihood river**	**None**	**Wick River**	**None**	**ND1997853449 ND2100050929**
A4	Unnamed Drain	Modified natural channel	None	None	Wick River	None	ND2245352151
A5	**Wick River (source to Loch Watten Burn)**	**Natural channel**	**High likelihood river**	**None**	**Wick River**	**Moderate**	**ND2259751330**
A6	Red Burn	Natural channel	None	None	Wick River	None	ND2172351212
A7	**Loch Burn**	**Natural channel**	**High likelihood river**	**None**	**Wick River**	**None**	**ND2057750882**
A8	**Halsary Burn (and tributaries)**	**Natural channel**	**High likelihood river**	**None**	**Wick River**	**Moderate**	**ND2019050682**
A9	**The Stem (and tributaries)**	**Natural channel**	**High likelihood river**	**None**	**Wick River**	**None**	**ND2011150175**
A10	**Allt Caol**	**Natural channel**	**High likelihood river**	**None**	**Wick River**	**None**	**ND1848449038**
A11	Causeymire Burn	Natural channel	None	None	River Thurso	None	ND1755548231
A12	Allt an Fheòir	Natural channel	None	None	River Thurso	None	ND1786347447
A13	**Burn of Tacher**	**Natural channel**	**High likelihood river**	**None**	**River Thurso**	**None**	**ND1761146512**
A24	**Little River / Loop Burn (and tributaries)**	**Natural channel**	**High likelihood river**	**Limited high likelihood**	**River Thurso**	**Good**	**ND1710846225**

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
A15	Burn of Leavad / Burn of Badachraskach	Modified natural channel	None	None	River Thurso	None	ND1745945553
A16	Unnamed Drains	Drainage ditches	None	None	River Thurso	None	ND1749144514
A17	Burn of Aultachlevan	Natural channel	None	None	River Thurso	Good	ND1825742037
A18	**Loch Rangag**	**Surface water body**	**High likelihood river**	**High likelihood**	**River Thurso**	**None**	**ND1789841749**
A19	Burn of Clashcrebie	Modified natural channel	None	None	River Thurso	None	ND1875440975
A20	Burn of Lochend	Natural channel	None	None	River Thurso	None	ND1870540259
A21	Bushy Burn	Modified natural channel	None	None	River Thurso	None	ND1810440306
A22	Burn of Braehungie (and tributaries)	Modified natural channel	None	None	Wick Coastal	None	ND1835538078
A23	**Burn of Latheronwheel (and tributaries)**	**Natural channel**	**High likelihood river**	**None**	**Wick Coastal**	**Good**	**ND1776636536**
A24	**Burn of Houstry**	**Natural channel**	**High likelihood river**	**None**	**Dunbeath Water**	**Good**	**ND1552632153**
A25	**Allt an Learanaich**	**Natural channel**	**High likelihood river**	**None**	**Dunbeath Water**	**None**	**ND1451832024**
A26	**Dunbeath Water**	**Natural channel**	**High likelihood river**	**None**	**Dunbeath Water**	**Good**	**ND1401531197**
A27	**Achorn Burn**	**Natural channel**	**High likelihood river**	**None**	**Dunbeath Water**	**None**	**ND1366430584**
A28	**Allt Tarsuinn (and tributaries)**	**Natural channel**	**Limited high likelihood river**	**None**	**Dunbeath Water**	**None**	**ND1318629718**
A29	Unnamed watercourse	Natural channel	None	None	Dunbeath Water	None	ND1320228879
A30	Allt na Buaidhe (and tributaries)	Modified natural channel	None	None	Wick Coastal	None	ND1261827804 ND1217527368

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
A31	Borge Loch	Surface water body	None	Medium likelihood	Berriedale Water	None	ND1202527065
A32	**Berriedale Water**	**Natural channel**	**High likelihood river**	**None**	**Berriedale Water**	**Moderate**	**ND1084423553**
A33	Turnal Burn	Natural channel	None	None	Berriedale Water	None	ND0968522578
A34	**Berriedale Water (and tributaries)**	**Natural channel**	**High likelihood river**	**None**	**Berriedale Water**	**Moderate**	**ND0985822078**
A35	Allt Bad Asgaraidh	Natural channel	None	None	Berriedale Water	None	ND0906422203
A36	Allt Sleibhtean	Drainage ditch	None	None	Wick Coastal	None	ND0849220727
A37	**Ousdale Burn**	**Natural channel**	**High likelihood river**	**None**	**Wick Coastal**	**Good**	**ND0752719943**
A38	Allt a' Bhurg	Natural channel	None	None	Wick Coastal	None	ND0631318755
A39	Allt an Fhudair	Natural channel	None	None	Wick Coastal	None	ND0553418698
A40	Ord Burn	Modified natural channel	None	None	Brora Coastal	None	ND0521018180
A41	Allt Briste (1)	Modified natural channel	None	None	Brora Coastal	None	ND0469617605
A42	Spur Burn / Feith Dubh	Modified natural channel	None	None	Brora Coastal	None	ND0386317717 ND0343517214
A43	Allt Briste (2)	Modified natural channel	None	None	Brora Coastal	None	ND0328417095
A44	Allt Sgrigil	Natural channel	None	None	River Helmsdale	None	ND0249217562
A45	**River Helmsdale**	**Natural channel**	**High likelihood river**	**None**	**River Helmsdale**	**Good**	**ND0181017501**
A46	Allt Sgealbach	Natural channel	None	None	River Helmsdale	None	ND0112016839
A47	Auchvadlie Burn	Natural channel	None	None	Brora Coastal	None	ND0149515152
A48	**Gartymore Burn**	**Natural channel**	**High likelihood river**	**None**	**Brora Coastal**	**None**	**ND0068414922**

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
A49	**Garbh Allt**	**Natural channel**	**High likelihood river**	**None**	**Brora Coastal**	**None**	**ND0034414290**
A50	Midgarty Burn	Natural channel	None	None	Brora Coastal	None	NC9956313179
A51	Westgarty Burn	Natural channel	None	None	Brora Coastal	None	NC9852913049
A52	**Culgower Burn**	**Natural channel**	**High likelihood river**	**None**	**Brora Coastal**	**None**	**NC9723212327**
A53	Allteenie Burn	Natural channel	None	None	Brora Coastal	None	NC9644011865
A54	Unnamed Drain	Drainage ditch	None	None	Brora Coastal	None	NC9569911009
A55	**Loth Burn (and tributaries)**	**Natural channel**	**High likelihood river**	**None**	**Brora Coastal**	**Moderate**	**NC9469111053**
A56	Unnamed Drain	Drainage ditch	None	None	Brora Coastal	None	NC9410310253
A57	Allt na Cuile	Natural channel	None	None	Brora Coastal	None	NC9340710149
A58	Allt Choli	Natural channel	None	None	Brora Coastal	None	NC9340710149
A59	**Kintradwell Burn**	**Natural channel**	**High likelihood river**	**None**	**Brora Coastal**	**None**	**NC9099409079**
Section A1.6							
A60	Eldrable Burn	Natural channel	None	None	River Helmsdale	None	NC9789117384
A61	Oulmsdale Burn	Natural channel	High likelihood river	None	River Helmsdale	None	NC9629417232 NC9566017398
A62	Badenahaughlish Burn	Natural channel	None	None	Brora Coastal	None	NC9161210718

Private Water Supplies

11.2.18 THC's open data Private Water Supply mapping[131] indicates that there are 15 private water supplies (PWS) within 1 km of Section A of the Proposed Development. The details of these supplies are presented in **Table 11.2**.

Table 11.2: Private Water Supplies within 1 km of Section A of the Proposed Development

PWS Name	Unique ID	Source	Eastings	Northings	Scoped in / Scoped out
Lower Toftingall	33602	Unknown	317721	954004	**Scoped in** as within the Proposed Development and source currently unknown
Benechiel	33557	Unknown	318500	939200	**Scoped in** as within the Proposed Development
Ousdale	31634	Unknown	306764	920526	**Scoped in** as within the Proposed Development and source currently unknown
Navidale Farm	44560	Spring	304138	916201	**Scoped in** as hydrologically connected to the Proposed Development
Caen Helmsdale	34896	Spring	301698	917753	**Scoped in** as within the Proposed Development
West Garty Farmhouse	31023	Unknown	298884	912437	**Scoped in** as hydrologically connected to the Proposed Development
Burnside Croft	42816	Stream	298559	912480	**Scoped in** as within the Proposed Development
Crakaig Estate	31146	Stream	295719	911098	**Scoped in** as within the Proposed Development
Ballinreach	46567	Stream	292495	908603	**Scoped in** as hydrologically connected to the Proposed Development
Kintradwell Lodge	31147	Stream	291200	908747	**Scoped in** as within the Proposed Development
Section A1.6					
River Cottage	38475	Unknown	299771	918528	**Scoped in** as within the Proposed Development
Birchwood Lodge	47725	Surface – Watercourse	298586	918646	Scoped out as hydrologically disconnected by topography and existing watercourses
Kilphedir	41897	Unknown	298671	918777	**Scoped in** as within the Proposed Development and source currently unknown
Torrish Estate	41894	Spring	297503	918716	Scoped out as hydrologically disconnected by topography and existing watercourses
Upper Torrish	38732	Unknown	297291	918831	**Scoped in** as within the Proposed Development and source currently unknown

Public Water Supplies

11.2.19 The Northern Highlands, Caithness and Brora groundwater bodies are classified as drinking water protected areas (groundwater).

11.2.20 The following rivers/lochs and associated catchments are categorised as drinking water protected areas (rivers or lochs) and are located within 1 km of Section A of the Proposed Development:

[131] Highland Council (2023) Private Water Supplies. Available online at: https://map-highland.opendata.arcgis.com/datasets/ded172bbade24650bb2c1baec5e0d318_0/explore?location=58.272310%2C-3.486833%2C9.00

- River Thurso - Loch More to sea (River Thurso catchment);
- Dun Burn (Dun Burn catchment); and
- Culgower Burn (Culgower Burn catchment).

Statutory Designated Sites

11.2.21 Statutory designated sites within the Study Area and their hydrological connectivity to the Proposed Development are detailed in **Table 11.3.**

Table 11.3: Statutory Designated Sites within the Study Area or with significant hydrologic connectivity to the Proposed Development (Section A)

Designated Receptor	Distance from Site	Qualifying interest	Scoped in / Scoped out
Banniskirk Quarry SSSI	Within Proposed Development	Silurian - Devonian Chordata	Scoped out as not hydrologically dependent
Shielton Peatlands SSSI, SAC, SPA, Ramsar	Within Proposed Development	Blanket bog, Breeding bird assemblage, Acid peat-stained lakes and ponds, Black-throated diver (breeding), Common scoter (breeding)	**Scoped in** as within Proposed Development and hydrologically dependent
Leavad SSSI	Within Proposed Development	Quaternary of Scotland	Scoped out as not hydrologically dependent
Dunbeath Water SSSI	Within Proposed Development	Quaternary of Scotland, Upland birch woodland	**Scoped in** as surface water feature is within Proposed Development
Berriedale Water SSSI	Within Proposed Development	Upland birch woodland	**Scoped in** as surface water feature is within Proposed Development
Langwell Water SSSI	Within Proposed Development	Upland birch woodland	**Scoped in** as surface water feature is within Proposed Development
Ousdale Burn SSSI	Within Proposed Development	Upland birch woodland	**Scoped in** as surface water feature is within Proposed Development
Garbh Allt SSSI	Within Proposed Development	Upland birch woodland	**Scoped in** as within Proposed Development route and hydrologically connected
Loth Gorge SSSI	Within Proposed Development	Upland birch woodland	**Scoped in** as within Proposed Development and Loth Burn drains through the SSSI
Blar nam Faoileag SSSI	Adjacent to Proposed Development	Blanket bog	**Scoped in** as adjacent to Proposed Development and hydrologically dependent
Coire na Beinne Mires SSSI	Adjacent to Proposed Development	Blanket bog	**Scoped in** as adjacent to Proposed Development and hydrologically dependent
Berriedale Cliffs SSSI	200 m south	Fulmar (breeding), Guillemot (breeding)	Scoped out as not hydrologically dependent
East Caithness Cliffs SAC, SPA	200 m south	Vegetated sea cliffs, Cormorant	Scoped out as not hydrologically dependent

Designated Receptor	Distance from Site	Qualifying interest	Scoped in / Scoped out
		(breeding), Fulmar (breeding)	
Ballinreach Coastal Gorges SSSI	595 m south	Kimmeridgian, Upland birch woodland	Scoped out as not hydrologically dependent
Spittal Quarry SSSI	645 m west	Silurian - Devonian Chordata	Scoped out as hydrologically disconnected by existing watercourses and not hydrologically dependent
Helmsdale Coast SSSI	910 m south	Kimmeridgian, Mesozoic Palaeobotany	Scoped out as not hydrologically dependent

Flood Risk

11.2.22 A summary of the potential sources and risk of flooding for Section A is provided in **Table 11.4**.

Table 11.4: Potential Sources of Flood Risk in Section A

Flooding Source	Potential Risk	Justification
Coastal	Negligible	The SEPA Flood Map shows that the Proposed Development is not at risk of tidal or coastal flooding.
Fluvial	Medium	The SEPA Flood Map shows that fluvial flood extents associated with the watercourses crossed by the Proposed Development are localised in extent and do not extend significantly beyond the watercourses. Areas of high risk are crossed by the Proposed Development as detailed in **Table 11.1**. With the implementation of appropriate crossing design in accordance with SEPA guidance this is not considered a significant constraint.
Pluvial	Low	The SEPA Flood Map shows that localised areas of pluvial flooding occur in topographic low points. Pluvial flooding will be mitigated by best practice design measures and mitigation and is not considered a design constraint.
Groundwater	Negligible	The SEPA groundwater flood map (within the Flood Risk Management Maps) illustrates that the Proposed Development is not considered at risk from potential groundwater flooding.
Flood Defence Breach	Negligible	The Proposed Development does not benefit from the protection of any flood defences.
Artificial Drainage	Negligible	The Proposed Development is located remote from any artificial drainage systems.
Reservoirs	Negligible	The SEPA Reservoir Flood Map shows the Proposed Development is not at risk of flooding in the event a reservoir fails.

Study Area Alterations

11.2.23 The Study Area for Section A has been extended to capture the full extent of the Loch of Toftingall.

Section B - Brora to Loch Buidhe

Surface Water

11.2.24 Section B of the Proposed Development has the potential to cross approximately 26 watercourses across three catchments, depending on the final route alignment and micrositing. OS mapping and aerial photography have been used to distinguish between those watercourses that have a natural plan form and geometry, and are therefore of higher value, and those which are artificial drainage ditches, of lesser value. The crossings have also been compared with SEPA Flood Hazard and Risk

Maps to identify where areas of potential flood risk are likely to be encountered**. Table 11.5** below provides a summary of the watercourses crossed by Section B of the Proposed Development, with watercourses at high likelihood of flooding from rivers, the sea or other surface water bodies shown in bold font. A summary of the flood risk from all sources across Section B is included in **Table 11.8.**

Table 11.5: Watercourse and Surface Water Body Crossings (Section B - Brora to Loch Buidhe)

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
B1	**Clynemilton Burn**	**Natural channel**	**High likelihood river**	**None**	**Brora Coastal**	**None**	**NC8958208248**
B2	**An Dubh-lochan**	**Surface water body and watercourse**	**High likelihood river**	**High likelihood**	**Brora Coastal**	**None**	**NC8805807740**
B3	**Loch Brora (South Basin)**	**Surface water body**	**High likelihood river**	**High likelihood**	**River Brora**	**Good**	**NC8535007043**
B4	**River Brora**	**Natural channel**	**High likelihood river**	**None**	**River Brora**	**Good**	**NC8563305917**
B5	**Carol Burn**	**Natural channel**	**High likelihood river**	**None**	**River Brora**	**Good**	**NC8487606979**
B6	Allt Coire Aghaisgeig	Natural channel	None	None	River Brora	None	NC8459406292
B7	Allt Horn	Natural channel	None	None	Brora Coastal	None	NC8001204868
B8	**Golspie Burn**	**Natural channel**	**High likelihood river**	**None**	**Brora Coastal**	**Good**	**NC7985703966**
B9	Allt Cnoc na Gambna	Drainage ditch	None	None	Brora Coastal	None	NC7891503841
B10	Allt Eas nan Lar	Drainage ditch	None	None	Brora Coastal	None	NC7897503503
B11	Allt Strath Lunndaidh	Natural channel	None	None	Brora Coastal	None	NC7775301516
B12	**Loch Lunndaidh**	**Surface water body**	**High likelihood river**	**High likelihood**	**Brora Coastal**	**None**	**NC7805201356**
B13	Aberscross Burn	Natural channel	None	None	River Fleet	None	NH7666999964
B14	**Morvich Burn**	**Natural channel**	**High likelihood river and coastal**	**High likelihood**	**River Fleet**	**Good**	**NC7580600076**
B15	**River Fleet (and tributaries)**	**Heavily modified channel**	**High likelihood river and coastal**	**High likelihood**	**River Fleet**	**Moderate**	**NH7527699780**

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
B16	Allt Reidh Chalmai	Natural channel	None	None	River Fleet	None	NH7477199697
B17	**Loch Ruagaidh**	**Surface water body**	**None**	**High likelihood**	**River Fleet**	**None**	**NH7330199422**
B18	Allt Loch ruagaidh	Natural channel	None	None	River Fleet	None	NH7323898852
B19	Abhainn an t-Sratha Carnaig	Natural channel	None	None	River Fleet	Good	NH7311798551 NH7104198359
B20	**Allt na h-Innse Aonair**	**Natural channel**	**High likelihood river**	**None**	**River Fleet**	**None**	**NH7265698788**
B21	Allt Lochan Maolanaidh	Natural channel	None	None	River Fleet	None	NH7197897672
B22	Garskelly Burn	Natural channel	None	None	River Fleet	None	NH7151297636
B23	**Loch na Feannaig**	**Surface water body**	**High likelihood river**	**High likelihood**	**River Fleet**	**None**	**NH6910097444**
B24	Allt Loch na Feannaig	Drainage channel	None	None	River Fleet	None	NH6865198119
B25	**Loch Buidhe (and tributaries)**	**Surface water body and natural channels**	**High likelihood river**	**High likelihood**	**River Fleet**	**High**	**NH6706798171**
Section B1.1							
B26	Allt Bad a' Chrasgaidh	Natural channel	None	None	River Fleet	None	NC7590302502

Private Water Supplies

11.2.25 THC's open data Private Water Supply mapping[132] indicates that there are five PWS within 1 km of Section B of the Proposed Development. The details of these supplies are presented in **Table 11.6**.

Table 11.6: Private Water Supplies within 1 km of Section B of the Proposed Development.

PWS Name	Unique ID	Source	Eastings	Northings	Scoped in / Scoped out
Killen	46107	Groundwater - Borehole	285558	907084	**Scoped in** as located within Proposed Development
Carrol Farm	36617	Unknown	284901	906996	**Scoped in** as located within Proposed Development
Torboll Farmhouse	31335	Unknown	275080	899050	**Scoped in** as hydrologically connected to the Proposed Development
283 Torboll	31000	Unknown	270294	898746	**Scoped in** as hydrologically connected to the Proposed Development
Brae Cottage	52162	Surface - Watercourse	270197	898622	**Scoped in** as hydrologically connected to the Proposed Development

Public Water Supplies

11.2.26 The Northern Highlands and Brora groundwater bodies are classified as drinking water protected areas (groundwater).

11.2.27 The following rivers/lochs and associated catchments are categorised as drinking water protected areas (rivers or lochs) and are located within 1 km of Section B of the Proposed Development:

- Loch Horn (Loch Horn catchment); and
- Loch Lunndaidh (Loch Lunndaidh catchment).

Statutory Designated Sites

11.2.28 Statutory designated sites within the Study Area and their hydrological connectivity to the Proposed Development are detailed in **Table 11.7**.

Table 11.7: Statutory Designated Sites within the Study Area or with significant hydrologic connectivity to the Proposed Development (Section B - Brora to Loch Buidhe)

Designated Receptor	Distance from Site	Qualifying interest	Scoped in / Scoped out
Strathfleet SSSI	Within Proposed Development	Moine, Upland oak woodland, Vascular plant assemblage	Scoped in as within Proposed Development and potential hydrological dependence

[132] Highland Council (2023) Private Water Supplies. Available online at: https://map-highland.opendata.arcgis.com/datasets/ded172bbade24650bb2c1baec5e0d318_0/explore?location=58.272310%2C-3.486833%2C9.00

Designated Receptor	Distance from Site	Qualifying interest	Scoped in / Scoped out
Mound Alderwoods SSSI, SAC	Within Proposed Development	Breeding bird assemblage, Saline lagoon, Alder woodland on floodplains	Scoped in as within Proposed Development and hydrologically dependent
Dornoch Firth and Loch Fleet SPA, Ramsar	Within Proposed Development	Bar-tailed godwit (non-breeding), Curlew (non-breeding)	Scoped in as within Proposed Development and habitat for birds is hydrologically dependent
Torboll Woods SSSI	Within Proposed Development	Upland oak woodland	Scoped in as within Proposed Development and follows course of Abhainn an t-Sratha Carnaig
Strath Carnaig and Strath Fleet Moors SSSI, SPA	Within Proposed Development	Hen harrier (breeding)	Scoped in as within Proposed Development and potential hydrological dependence for habitat
Carrol Rock SSSI	100 m north	Upland birch woodland	Scoped out as hydrologically connected to Proposed Development by topography and existing watercourses

Flood Risk

11.2.29 A summary of the potential sources and risk of flooding for Section B is provided in **Table 11.8**.

Table 11.8: Potential Sources of Flood Risk in Section B

Flooding Source	Potential Risk	Justification
Coastal	Medium	The SEPA Flood Map shows that the Proposed Development is at risk of coastal flooding. Areas of flood risk are crossed by the proposed development as detailed in **Table 11.5**. With the implementation of appropriate crossing design in accordance with SEPA guidance this is not considered a significant constraint.
Fluvial	Medium	The SEPA Flood Map shows that fluvial flood extents associated with the watercourses crossed by the Proposed Development are localised in extent and do not extend significantly beyond the watercourses. Areas of high risk are crossed by the Proposed Development as detailed in **Table 11.5**. With the implementation of appropriate crossing design in accordance with SEPA guidance this is not considered a significant constraint.
Pluvial	Low	The SEPA Flood Map shows that localised areas of pluvial flooding occur in topographic low points. Pluvial flooding will be mitigated by best practice design measures and mitigation and is not considered a design constraint.
Groundwater	Negligible	The SEPA groundwater flood map (within the Flood Risk Management Maps) illustrates that the Proposed Development is not considered at risk from potential groundwater flooding.
Flood Defence Breach	Negligible	The Proposed Development does not benefit from the protection of any flood defences.
Artificial Drainage	Negligible	The Proposed Development is located remote from any artificial drainage systems.
Reservoirs	Medium	The SEPA Reservoir Flood Map shows the Proposed Development is not located within modelled flood extents in the event of a reservoir breach.

Study Area Alterations

11.2.30 The 1 km buffer suitably captures all potentially impacted sensitive receptors along Section B of the Proposed Development. No alterations to the Study Area are needed for Section B.

Section C - West of Dornoch

Surface Water

11.2.31 Section C of the Proposed Development has the potential to cross approximately 13 watercourses across five catchments, depending on the final route alignment and micrositing. OS mapping and aerial photography have been used to distinguish between those watercourses that have a natural plan form and geometry, and are therefore of higher value, and those which are artificial drainage ditches, of lesser value. The crossings have also been compared with SEPA Flood Hazard and Risk Maps to identify where areas of potential flood risk are likely to be encountered. **Table 11.9** below provides a summary of the watercourses crossed by Section C of the Proposed Development, with watercourses at high likelihood of flooding from rivers, the sea or other surface water bodies shown in bold font. A summary of the flood risk from all sources across Section C is included in **Table 11.12.**

Table 11.9: Watercourse and Surface Water Body Crossings (Section C - West of Dornoch)

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
C1	**Tributaries of Allt Garbh-airigh**	**Natural channel**	**Tributaries - None along the Allt Garbh-airigh high likelihood river**	**None**	**River Fleet**	**Tributaries – None** **Allt Garbh-airigh - Good**	**NH6435597304**
C2	Tributaries of Allt Loch Leisgein	Natural channel	None	None	Dornoch Coastal	None	NH6341097733 NH6162097723
C3	**Allt Loch Leisgein**	**Natural channel**	**High likelihood river**	**Limited areas of high likelihood**	**Dornoch Coastal**	**Good**	**NH6249597416**
C4	**Loch Leisgein**	**Natural water body**	**None**	**High likelihood**	**Dornoch Coastal**	**None**	**NH6086697645**
C5	Allt na Ciste Duibhe	Natural channel	None	None	River Shin	None	NH6059397332
C6	Unnamed Drains	Drainage ditch	None	High likelihood	Dornoch Coastal	None	NH592316901 NH5913596770
C7	**Henman's Burn**	**Natural channel**	**High likelihood river**	**None**	**Dornoch Coastal**	**None**	**NH5850296420**
C8	**Dornoch Firth Estuary**	**Natural channel**	**High likelihood river and coastal**	**None**	**Dornoch Firth**	**Good**	**NH5717696010**
C9	**Culrain Burn**	**Natural channel**	**High likelihood river**	**None**	**Dornoch Coastal**	**Good**	**NH5648395197**
C10	**Loch a'Choire**	**Natural water body**	**High likelihood river**	**High likelihood**	**Dornoch Coastal**	**None**	**NH5615195152**
C11	Allt an t-Sidhein	Natural channel	None	None	Dornoch Coastal	None	NH5618794318
C12	Allt na Ceardaich	Drainage ditch	None	None	Dornoch Coastal	None	NH5660793973

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
C13	Tributaries of Allt an Tartair	Drainage ditch	None	High likelihood	River Carron (Sutherland)	None	NH5666691153

Private Water Supplies

11.2.32 THC's open data Private Water Supply mapping[133] indicates that there are nine PWS within 1 km of Section C of the Proposed Development. The details of these supplies are presented in **Table 11.10**.

Table 11.10: Private Water Supplies within 1 km of Section C of the Proposed Development

PWS Name	Unique ID	Source	Eastings	Northings	Scoped in / Scoped out
Sleasdaraidh	43293	Spring	264473	896616	**Scoped in** as hydrologically connected – downslope of Proposed Development
Reidbreac Croft	31134	Groundwater - Spring	263579	896423	**Scoped in** as hydrologically connected – downslope of Proposed Development
Craigton Farm	31358	Borehole	262697	896110	**Scoped in** as hydrologically connected – downslope of Proposed Development
Helendale	31350	Groundwater - Borehole	256691	896731	Scoped out as hydrologically disconnected by topography and existing watercourses
Seangan	45612	Stream	256432	896616	Scoped out as hydrologically disconnected by topography and existing watercourses
Rowan House	48636	Borehole	256658	896522	Scoped out as hydrologically disconnected – upstream of Proposed Development
Inver House	37657	Unknown	256776	896434	**Scoped in** as within the Proposed Development and source currently unknown
Culrain Mains	37381	Unknown	257259	893735	**Scoped in** as hydrologically connected – downstream of Proposed Development
Plot 3 Culeave	36010	Unknown	255233	891390	**Scoped in** as within the Proposed Development and source currently unknown

Public Water Supplies

11.2.33 The Northern Highlands groundwater body is classified as a drinking water protected area (groundwater).

11.2.34 There are no surface water drinking water protected areas (rivers or lochs) within 1 km or in significant hydrological connection to Section C of the Proposed Development.

Statutory Designated Sites

11.2.35 Statutory designated sites within the Study Area and their hydrological connectivity to the Development are detailed in **Table 11.11**.

[133] Highland Council (2023) Private Water Supplies. Available online at: https://map-highland.opendata.arcgis.com/datasets/ded172bbade24650bb2c1baec5e0d318_0/explore?location=58.272310%2C-3.486833%2C9.00

Table 11.11: Statutory Designated Sites within the Study Area or with significant hydrologic connectivity to the Proposed Development (Section C - West of Dornoch)

Designated Receptor	Distance from Site	Qualifying interest	Scoped in / Scoped out
Strath Carnaig and Strath Fleet Moors SSSI, SPA	Within the Proposed Development	Hen harrier, breeding	**Scoped in** as hydrologically connected to Proposed Development and potential hydrological dependence of habitat
Kyle of Sutherland Marshes SSSI	Within the Proposed Development	Flood-plain fen, Vascular plant assemblage, Wet woodland	**Scoped in** as hydrologically connected to Proposed Development and hydrologically dependent
River Oykel SAC	Within the Proposed Development	Atlantic salmon, Freshwater pearl mussel	**Scoped in** as hydrologically connected to Proposed Development and hydrologically dependent

Flood Risk

11.2.36 A summary of the potential sources and risk of flooding for Section C is provided in **Table 11.12**.

Table 11.12: Potential Sources of Flood Risk in Section C

Flooding Source	Potential Risk	Justification
Coastal	Medium	The SEPA Flood Map shows that the Proposed Development is at risk of coastal flooding. Areas of high risk are crossed by the proposed development as detailed in **Table 11.9**. With the implementation of appropriate crossing design in accordance with SEPA guidance this is not considered a significant constraint.
Fluvial	Medium	The SEPA Flood Map shows that fluvial flood extents associated with the watercourses crossed by the Proposed Development are localised in extent and do not extend significantly beyond the watercourses. Areas of high risk are crossed by the Proposed Development as detailed in **Table 11.9**. With the implementation of appropriate crossing design in accordance with SEPA guidance this is not considered a significant constraint.
Pluvial	Low	The SEPA Flood Map shows that localised areas of pluvial flooding occur in topographic low points. Pluvial flooding will be mitigated by best practice design measures and mitigation and is not considered a design constraint.
Groundwater	Negligible	The SEPA groundwater flood map (within the Flood Risk Management Maps) illustrates that the Proposed Development is not considered at risk from potential groundwater flooding.
Flood Defence Breach	Negligible	The Proposed Development does not benefit from the protection of any flood defences.
Artificial Drainage	Negligible	The Proposed Development is located remote from any artificial drainage systems.
Reservoirs	Medium	The SEPA Reservoir Flood Map shows the Proposed Development is not located within modelled flood extents in the event of a reservoir breach.

Study Area Alterations

11.2.37 The 1 km buffer suitably captures all potentially impacted sensitive receptors along Section C of the Proposed Development. No alterations to the Study Area are needed for Section C.

Section D - Dornoch to Dingwall

Surface Water

11.2.38 Section D of the Proposed Development has the potential to cross approximately 68 watercourses across six catchments, depending on the final route alignment and micrositing. OS mapping and aerial photography have been used to distinguish between those watercourses that have a natural plan form and geometry, and are therefore of higher value, and those which are artificial drainage ditches, of lesser value. The crossings have also been compared with SEPA Flood Hazard and Risk Maps to identify where areas of potential flood risk are likely to be encountered. **Table 11.13** below provides a summary of the watercourses crossed by Section D of the Proposed Development, with watercourses at high likelihood of flooding from rivers, the sea or other surface water bodies shown in bold font. A summary of the flood risk from all sources across Section D is included in **Table 11.16**.

Table 11.13: Watercourse and Surface Water Body Crossings (Section D - Dornoch to Dingwall)

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
D1	**Allt an Tartair (and tributaries)**	**Drainage ditch**	**None**	**High likelihood**	**River Carron (Sutherland)**	**None**	**NH5660191141**
D2	**River Carron (and tributaries)**	**Heavily modified water body**	**High likelihood river**	**None**	**River Carron (Sutherland)**	**Good**	**NH5652890900**
D3	**Allt Dounie**	**Natural channel**	**High likelihood river**	**None**	**River Carron (Sutherland)**	**None**	**NH5682590487 NH5575988879**
D4	Allt Srath nan gach	Natural channel	None	None	River Carron (Sutherland)	None	NH5579888632
D5	Allt Eiteachan (and tributaries)	Natural channel	None	None	Dornoch Coastal	Good	NH5595787758
D6	**Allt an Eilich**	**Natural channel**	**High likelihood river**	**None**	**Dornoch Coastal**	**None**	**NH5696885892**
D7	Abhainn a' Choire Bhuig (and tributaries)	Natural channel	None	None	Dornoch Coastal	None	NH5666185700 NH5763285105
D8	Sruthan an Tairbh	Natural channel	None	None	Dornoch Coastal	None	NH5652485071
D9	**Wester Fearn Burn / Allt Coire Bhenneit**	**Natural channel**	**High likelihood river**	**None**	**Dornoch Coastal**	**Moderate**	**NH5721983790 NH5633483590**
D10	Unnamed watercourse	Natural channel	None	None	Dornoch Coastal	None	NH5662483885
D10	Unnamed watercourse	Natural channel	None	None	Dornoch Coastal	None	NH5666383220 NH5687583199
D11	Allt a' Choire Dhuibh	Natural channel	None	None	River Alness	None	NH5682581566
D12	**Black Water (and tributaries)**	**Natural channel**	**High likelihood river**	**None**	**River Alness**	**Good**	**NH5591480761**

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
D13	**Allt Coire na Cloiche**	**Natural channel**	**High likelihood river**	**None**	**River Alness**	**None**	**NH5641380460**
D14	Unnamed Watercourse	Natural channel	None	None	River Alness	None	NH5515879490
D15	**Allt Loch Bad a' Bhàthaich**	**Natural channel**	**High likelihood river**	**None**	**River Alness**	**None**	**NH5560978723**
D16	Unnamed Watercourse	Natural channel	None	None	River Alness	None	NH5573778596
D17	Allt Bad na h-Achlaise	Drainage ditch	None	None	River Alness	None	NH5583777060
D18	Allt na Cruaiche	Natural channel	None	None	River Alness	None	NH5557076055
D19	**Alness River (and tributaries)**	**Natural channel**	**High likelihood river**	**None**	**River Alness**	**Good**	**NH5580275274**
D20	Allt a' Mhuilinn	Natural channel	None	None	River Alness	None	NH5606273891 NH5650373644
D21	**Allt a' Ghreaich**	**Natural channel**	**High likelihood rivers**	**None**	**River Alness**	**None**	**NH5714173164**
D22	Unnamed Drain	Drainage ditch	None	None	River Alness	None	NH5750572092
D23	**Allt na Seasgaich**	**Natural channel**	**High likelihood rivers**	**None**	**River Alness**	**Good**	**NH5751871899**
D24	Allt a' Bhuideanaich	Natural channel	None	None	River Alness	None	NH5712870386

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
D25	Loch a' Chaplaich	Surface water body	None	None	River Alness	None	NH5713970097
D26	Allt na Moine	Surface water body	None	None	River Glass	None	NH5644970172
D27	Allt Bad na Glaice	Surface water body	None	None	River Glass	None	NH5607969733
D28	**Allt a' Ghlinne (Glen Burn)**	**Surface water body**	**High likelihood river**	**None**	**River Glass**	**None**	**NH5602069108**
D29	**River Glass**	**Heavily modified water body**	**High likelihood river**	**None**	**River Glass**	**Good**	**NH5566768451**
D30	Unnamed Ditch	Drainage ditch	None	None	River Glass	None	NH5502268483
D40	**Allt nan Caorach (and tributaries)**	**Natural channel**	**High likelihood river**	**Limited high likelihood**	**River Glass**	**Moderate**	**NH5533767865**
D41	Unnamed Watercourse	Natural channel	None	Limited high likelihood	River Glass	None	NH5557567825
D42	Unnamed Watercourse	Natural channel	None	None	River Glass	None	NH5560366702
D43	**Loch Agoo**	**Surface water body**	**None**	**High likelihood**	**River Glass**	**None**	**NH5568866752**
D44	Loch J.U	Surface water body	None	Medium likelihood	River Glass	None	NH5539966295
D45	Altan a Ruaidh	Drainage ditches	None	None	Cromarty Coastal	None	NH5465065796

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
D46	**River Skitheach (and tributaries)**	**Natural channel**	**High likelihood river**	**Limited medium likelihood**	**Cromarty Coastal**	**Moderate**	**NH5497065356 N53523 64042**
D47	Clare Burn	Natural channel	None	None	Cromarty Coastal	None	NH5423465250
D48	**Tiadh Allt**		**None**	**High likelihood**	**Cromarty Coastal**	**None**	**NH4805161200**
D49	**Peffery Burn / River Peffery**	**Heavily modified water body**	**High likelihood river**	**High likelihood**	**Cromarty Coastal**	**Moderate**	**NH4751860366**
D50	**Unnamed Surface Water Bodu**	**Surface water body**	**None**	**High likelihood**	**River Conon**	**None**	**NH4717359513**
D51	**An Dubh-lochan**	**Surface water body**	**High likelihood river**	**High likelihood**	**River Conon**	**None**	**NH4616658512**
D52	Unnamed Drain	Drainage ditch	None	None	River Conon	None	NH4630858272
D53	**Loch Kinellan**	**Surface water body**	**High likelihood river**	**High likelihood**	**Cromarty Coastal**	**None**	**NH4704757518**
D54	Unnamed Drain	Drainage Ditch	None	None	River Conon	None	NH4654156950
D55	**Rogie Burn (and tributaries)**	**Natural channel**	**High likelihood river**	**None**	**River Conon**	**Moderate**	**NH4597061009**
D56	**Allt Fionnaidh**	**Natural channel**	**High likelihood river**	**None**	**River Conon**	**None**	**NH4322559882**
D57	**Black River**	**Heavily modified water body**	**High likelihood river**	**None**	**River Conon**	**Good**	**NH4252559158**

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
D58	**Loch Garve**	**Surface water body**	**High likelihood river**	**High likelihood**	**River Conon**	**Good**	**NH4180259322**
D59	**Loch na Croic**	**Surface water body**	**High likelihood river**	**High likelihood**	**River Conon**	**None**	**NH4313359273**
D60	**Loch Ruith a'Phuill (and tributaries)**	**Surface water body**	**High likelihood river**	**High likelihood**	**River Conon**	**None**	**NH4186458263**
D61	Loch nan Eilid	Surface water body	None	High likelihood	River Conon	None	NH4085057306
D62	Allt na Feithe Corraich	Natural channel	None	None	River Conon	None	NH4122457487
D63	**Loch nan Cuilcean**	**Surface water body**	**High likelihood river**	**High likelihood**	**River Conon**	**None**	**NH4123457131**
D64	Alitan Torrain Bhaeanaich	Natural channel	None	None	River Conon	None	NH4092757037
D65	**River Canon (and tributaries)**	**Heavily modified water body**	**High likelihood river**	**None**	**River Conon**	**Moderate**	**NH4087655602**
D66	**Allt na Crìche**	**Drainage ditch**	**High likelihood river**	**None**	**River Conon**	**None**	**NH4210154906**
D67	**Allt na Fainich (and tributaries)**	**Natural channel**	**High likelihood river**	**None**	**River Conon**	**None**	**NH4132653951**
D68	**Loch Achonachie**	**Surface warer body**	**High likelihood river**	**High likelihood**	**River Conon**	**Good**	**NH4378554811**

Private Water Supplies

11.2.39 THC's open data Private Water Supply mapping[134] indicates that there are 47 PWS within 1 km of Section D of the Proposed Development. The details of these supplies are presented in **Table 11.14**.

Table 11.14: Private Water Supplies within 1 km of Section D of the Proposed Development

PWS Name	Unique ID	Source	Eastings	Northings	Scoped in / Scoped out
Plot 3 Culeave	36010	Unknown	255233	891390	**Scoped in** as within the Proposed Development and source currently unknown
Gruinards Farm	31033	Unknown	254861	890811	**Scoped in** as within the Proposed Development and source currently unknown
Trahenna	42448	Unknown	255217	890163	**Scoped in** as within the Proposed Development and source currently unknown
Braeantra	31414	Stream	256687	878015	Scoped out as hydrologically disconnected by topography and existing watercourses
Kinloch Cottage	56007	Surface – Watercourse	254952	254952	Scoped out as hydrologically disconnected by topography and existing watercourses
Novar - Strone	26421	Borehole	257800	874600	Scoped out as hydrologically disconnected by existing watercourses
Boath Road - Ballavoulen	31191	Groundwater - Spring	257284	874144	**Scoped in** as downslope of the Proposed Development
Novar Ballavoulen Cottage	49495	Spring	257284	874144	**Scoped in** as downslope of the Proposed Development
Novar Tigh na Craig	49500	Stream	255740	869076	**Scoped in** as hydrologically connected
Novar Westend Cottage	49497	Spring	256308	868873	**Scoped in** as hydrologically connected
Glenglass - West End	31276	Groundwater – Spring	256358	868882	**Scoped in** as hydrologically connected

[134] Highland Council (2023) Private Water Supplies. Available online at: https://map-highland.opendata.arcgis.com/datasets/ded172bbade24650bb2c1baec5e0d318_0/explore?location=58.272310%2C-3.486833%2C9.00

PWS Name	Unique ID	Source	Eastings	Northings	Scoped in / Scoped out
Eileanach	39234	Hill Loch	254829	868596	Scoped out as upstream of Proposed Development
Lynechork Farmstead	50820	Borehole	256714	867064	**Scoped in** as downslope of Proposed Development
Fannyfield House	29257	Well	255263	865777	**Scoped in** as hydrologically connected
Swordale - Milton Lodge Steading	31212	Borehole	256113	865605	**Scoped in** as downslope of Proposed Development
Swordale Milton Lodge	29415	Stream	256514	865409	Scoped out as hydrologically disconnected by existing watercourses
Castle Leod - Dower House	30622	Groundwater - Spring	248827	859721	**Scoped in** as downslope of Proposed Development
Castle Leod	30611	Groundwater - Spring	248964	859526	Scoped out as hydrologically disconnected by existing watercourses
Kinelllan Farm	29355	Groundwater - Well	247473	857920	**Scoped in** as downslope of Proposed Development
5 Kinnellan	31378	Groundwater – Borehole	247682	857603	Scoped out as hydrologically disconnected by existing watercourses
Kinellan-New House	30670	Groundwater – Borehole	247148	857310	**Scoped in** as within Proposed Development
Section D1.3 –Alternative					
Contin - Rogie Farm	29478	Surface - Watercourse	246069	861103	**Scoped in** as within Proposed Development
Blackwater Cottages	29742	Groundwater – Spring	241923	859079	**Scoped in** as within Proposed Development
Blackwater Cottages 2	31566	Borehole	241923	859079	**Scoped in** as within Proposed Development
Blackwater Cottages 3	31561	Groundwater - Borehole	241923	859079	**Scoped in** as within Proposed Development
Tarvie - New House Site	31573	Groundwater - Borehole	242652	858960	**Scoped in** as within Proposed Development
Tarvie - Inchroach, The Bungalow	35158	Spring	242543	858880	**Scoped in** as within Proposed Development
Tarvie Balnain Cottage	39600	Borehole	243046	858709	Scoped out due to topography

PWS Name	Unique ID	Source	Eastings	Northings	Scoped in / Scoped out
Tarvie Services	30991	Spring	243126	858648	Scoped out due to topography
Cnoc Grianach	46921	Hill Loch	243082	858676	Scoped out due to topography and existing watercourses
Tarvie Cairncroft	34196	Borehole	242898	858711	Scoped out due to topography
Tarvie – Gorstanchraggan	29314	Surface - Loch	242620	858683	Scoped out due to topography
Tarvie - Roseben	36502	Unknown	242463	858532	**Scoped in** as within the Proposed Development and source currently unknown
Tarvie Maclean	47701	Borehole	242411	858397	Scoped out due to topography
Tarvie Inchdrean	30626	Hill Loch	242388	858295	Scoped out due to topography
Tarvie Inchdrean MacKenzie	34242	Borehole	242388	858295	Scoped out due to topography
Tarvies – Brackendale	31529	Groundwater - Borehole	242238	858254	Scoped out due to topography
Tarvie Torfinlay	29523	Borehole	242920	857792	Scoped out due to topography and existing watercourses
Luichart Sub Station	55856	Rainwater	239254	857154	Scoped out as source is rainwater
Luichart Power Station	31465	Hill Loch	239391	857035	Scoped out as upstream from Proposed Development
Scatwell The Ceilidh Hall	48114	Borehole	239884	856046	Scoped out due to topography
Scatwell Stables	37548	Borehole	239826	855897	Scoped out due to topography
Scatwell House	30643	Borehole	239879	855879	Scoped out due to topography
Garriematic	31375	Borehole	241369	855471	**Scoped in** as within Proposed Development
Orrin Power Station	31462	Hill Loch	243584	854202	**Scoped in** as within Proposed Development
Fairburn Windfarm	37099	Rain harvesting	242360	853438	Scoped out as source is rainwater
Fairburn Muirton Mains	29574	Stream	245634	853274	**Scoped in** as possible hydrological connection

Public Water Supplies

11.2.40 The Northern Highlands, Muir of Ord and Invergordon groundwater bodies are classified as drinking water protected areas (groundwater).

11.2.41 The following rivers/lochs and associated catchments are categorised as drinking water protected areas (rivers or lochs) and are located within 1 km of Section D of the Proposed Development:

- Wester Fearn Burn (Wester Fearn Burn catchment);
- Alness River - Cromarty Firth to Strone (River Averon catchment);
- River Glass - Cromarty Firth to Redburn (River Glass - Cromarty Firth to Redburn catchment); and
- Allt Dubh (Allt Dubh catchment).

Statutory Designated Sites

11.2.42 Statutory designated sites within the Study Area and their hydrological connectivity to the Development are detailed in **Table 11.15**.

Table 11.15: Statutory Designated Sites within the Study Area or with significant hydrologic connectivity to the Proposed Development (Section D - Dornoch to Dingwall)

Designated Receptor	Distance from Site	Qualifying interest	Scoped in / Scoped out
Allt nan Caorach SSSI	Within the Proposed Development	Subalpine dry heath, Upland birch woodland	**Scoped in** as hydrologically connected to the Proposed Development and follows the course of Allt nan Caorach
Lower River Conon SSSI, SAC	841 m south-west	Open water transition fen, Saltmarsh, Alder woodland on floodplains	Scoped out as hydrologically disconnected by topography and existing watercourses
Section D1.3 –Alternative			
Glen Affric to Strathconon SPA	415 m west	Golden eagle (breeding)	Scoped out as hydrologically disconnected by topography

Flood Risk

11.2.43 A summary of the potential sources and risk of flooding for Section D is provided in **Table 11.16.**

Table 11.16: Potential Sources of Flood Risk in Section D

Flooding Source	Potential Risk	Justification
Coastal	Negligible	The SEPA Flood Map shows that the Proposed Development is not at risk of tidal or coastal flooding.
Fluvial	Medium	The SEPA Flood Map shows that fluvial flood extents associated with the watercourses crossed by the Proposed Development are localised in extent and do not extend significantly beyond the watercourses. Areas of high risk are crossed by the Proposed Development as detailed in **Table 11.13**. With the implementation of appropriate crossing design in accordance with SEPA guidance this is not considered a significant constraint.

Flooding Source	Potential Risk	Justification
Pluvial	Low	The SEPA Flood Map shows that localised areas of pluvial flooding occur in topographic low points. Pluvial flooding will be mitigated by best practice design measures and mitigation and is not considered a design constraint.
Groundwater	Negligible	The SEPA groundwater flood map (within the Flood Risk Management Maps) illustrates that the Proposed Development is not considered at risk from potential groundwater flooding.
Flood Defence Breach	Negligible	The Proposed Development does not benefit from the protection of any flood defences.
Artificial Drainage	Negligible	The Proposed Development is located remote from any artificial drainage systems.
Reservoirs	Medium	The SEPA Reservoir Flood Map shows the Proposed Development is not located within modelled flood extents in the event of a reservoir breach.

Study Area Alterations

11.2.44 The 1 km buffer suitably captures all potentially impacted sensitive receptors along Section D of the Proposed Development. No alterations to the Study Area are needed for Section D.

Section E - Dingwall to Beauly

Surface Water

11.2.45 Section E of the Proposed Development has the potential to cross approximately 24 watercourses across two catchments, depending on the final route alignment and micrositing. OS mapping and aerial photography have been used to distinguish between those watercourses that have a natural plan form and geometry, and are therefore of higher value, and those which are artificial drainage ditches, of lesser value. The crossings have also been compared with SEPA Flood Hazard and Risk Maps to identify where areas of potential flood risk are likely to be encountered. **Table 11.17** below provides a summary of the watercourses crossed by Section E of the Proposed Development, with watercourses at high likelihood of flooding from rivers, the sea or other surface water bodies shown in bold font. A summary of the flood risk from all sources across Section E is included in **Table 11.20**.

Table 11.17: Watercourse and Surface Water Body Crossings (Section E - Dingwall to Beauly)

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
E1	**Allt Drioghinn**	**Natural channel**	**High likelihood river**	**None**	**River Conon**	**None**	**NH4765355756**
E2	**Black Water - Conon Confluence to Loch Garve**	**Heavily modified waterbody**	**High likelihood river**	**None**	**River Conon**	**Good**	**NH4642554691**
E3	**River Conon - Orrin confluence to Loch Achonachie**	**Heavily modified waterbody**	**High likelihood river**	**None**	**River Conon**	**Good**	**NH4746154354**
E4	**Unnamed tributary of River Conon**	**Natural channel**	**High likelihood river**	**None**	**River Conon**	**None**	**NH4732554659**
E5	**Unnamed Drain**	**Drainage ditch**	**None**	**High likelihood**	**River Conon**	**None**	**NH4546553790**
E6	Unnamed tributary of Loch Achonachie	Natural channel	None	None	River Conon	None	NH4485053365
E7	Unnamed tributaries of River Orrin	Drainage ditches	None	None	River Conon	None	NH4476752746
E8	**River Orrin - Conon confluence to Orrin Reservoir**	**Heavily modified water body**	**High likelihood river**	**None**	**River Conon**	**Good**	**NH4498552315 NH4727851681**
E9	Allt Coir 'a' Chuil	Natural channel	None	None	River Conon	None	NH4578651473
E10	Unnamed tributary of River Orrin	Natural channel	None	None	River Conon	None	NH4649051176
E11	**Allt Goibhre**	**Heavily modified water body**	**High likelihood river**	**None**	**River Conon**	**Poor**	**NH4725050308**
E12	Allt Ruith Troimh Mhoin	Natural channel	None	None	River Conon	None	NH4760349682
E13	**Logie Burn – Muir of Ord to source**	**Natural channel**	**High likelihood river**	**None**	**River Conon**	**Poor**	**NH4779948643**
E14	Allt Loch nam Bonnach	Natural channel	None	None	River Conon	None	NH4815348623
E15	**Loch nam Bonnach (and tributaries)**	**Surface water body**	**High likelihood river**	**High likelihood**	**River Conon**	**None**	**NH4816048208**

Id	Watercourse Name	Watercourse Classification	Likelihood of river / coastal flooding	Likelihood of surface water flooding	Catchment Name	WFD Status	OS Grid Reference
E16	Allt Coille na Cleithe (and tributaries)	Natural channel	None	None	River Beauly	None	NH4688046171
E17	**Breakachy Burn**	**Natural channel**	**High likelihood river**	**None**	**River Beauly**	**High**	**NH4579345260**
E18	Unnamed Drain	Drainage ditch	None	None	River Beauly	None	NH4597644545
E19	**Allt na h-Athain**	**Natural channel**	**High likelihood river**	**None**	**River Beauly**	**None**	**NH4574143991**
E20	Allt na Crasgag (and tributaries)	Modified channel	None	None	River Beauly	None	NH4627643731
E21	Unnamed Surface Water Body	Artificial pond and ditch	None	None	River Beauly	None	NH4664543518
E22	Caochan a'Mheanbh Chruidh	Drainage ditch	None	Limited high likelihood	River Beauly	None	NH672443288
E23	**River Beauly**	**Heavily modified water body**	**High likelihood river**	**High likelihood**	**River Beauly**	**Good**	**NH4708443082**
E24	**Allt nan Damh**	**Artificial pond and ditch**	**High likelihood river**	**High likelihood**	**River Beauly**	**None**	**NH4751242736**

Private Water Supplies

11.2.46 THC's open data Private Water Supply mapping[135] indicates that there are 16 PWS within 1 km of Section E of the Proposed Development. The details of these supplies are presented in **Table 11.18**.

Table 11.18: Private Water Supplies within 1 km of Section E of the Proposed Development

PWS Name	Unique ID	Source	Eastings	Northings	Scoped in / Scoped out
Fairburn Mains	30683	Spring	246501	853408	**Scoped in** as possible hydrologic connection
Cnoc Vann	29449	Unknown	247468	845727	**Scoped in** as downslope of Proposed Development
2 Farley	56944	Stream	246829	845386	**Scoped in** as downslope of Proposed Development
3 Farley	29470	Unknown	247079	845320	**Scoped in** as within the Proposed Development and source currently unknown
Breakachy Farm	29440	Unknown	246072	844506	**Scoped in** as within Proposed Development
Culour of Breakachy	29454	Spring	246237	844151	**Scoped in** as within Proposed Development
Log House	37878	Unknown	246544	844366	**Scoped in** as downslope of Proposed Development
Wester Cruenassie	29460	Spring	246624	844335	**Scoped in** as downslope of Proposed Development
Cruenassie	29460	Unknown	246777	844478	**Scoped in** as downslope of Proposed Development
Taegait of Breakaday	29390	Groundwater – Spring	247189	844482	**Scoped in** as downslope of Proposed Development
Cluanie Farm	29445	Unknown	246940	844177	**Scoped in** as downslope of Proposed Development
Ardochy	39696	Stream	246255	843578	**Scoped in** as within preferred OHL route
Aigas Power Station	37056	River	247424	843691	**Scoped in** as downstream of the Proposed Development
Moulnaceap	29385	Hill runoff	246231	842608	**Scoped in** as downslope of the Proposed Development

[135] Highland Council (2023) Private Water Supplies. Available online at: https://map-highland.opendata.arcgis.com/datasets/ded172bbade24650bb2c1baec5e0d318_0/explore?location=58.272310%2C-3.486833%2C9.00

PWS Name	Unique ID	Source	Eastings	Northings	Scoped in / Scoped out
Tigh-Na-Laggan	29394	Unknown	246485	842174	**Scoped in** as within the Proposed Development and source currently unknown
Section E1.1					
Fairburn Muirton Mains	29574	Stream	245634	853274	Scoped out due to topography and existing watercourses

Public Water Supplies

11.2.47 The Northern Highlands, Muir of Ord, and Conon Valley and Muir of Ord Sand and Gravel groundwater bodies are classified as drinking water protected areas (groundwater).

11.2.48 There are no surface water drinking water protected areas (rivers or lochs) within 1 km or in significant hydrological connection to Section E of the Proposed Development.

Statutory Designated Sites

11.2.49 Statutory designated sites within the Study Area and their hydrological connectivity to the Development are detailed in **Table 11.19**.

Table 11.19: Statutory Designated Sites within the Study Area or with significant hydrologic connectivity to the Proposed Development (Section E - Dingwall to Beauly)

Designated Receptor	Distance from Site	Qualifying interest	Scoped in / Scoped out
Lower River Conon SSSI, SAC	Within the Proposed Development	Open water transition fen, Saltmarsh, Alder woodland on floodplains	**Scoped in** as hydrologically connected to the Proposed Development and hydrologically dependent

Flood Risk

11.2.50 A summary of the potential sources and risk of flooding for Section E is provided in **Table 11.20**.

Table 11.20: Potential Sources of Flood Risk in Section E

Flooding Source	Potential Risk	Justification
Coastal	Negligible	The SEPA Flood Map shows that the Proposed Development is not at risk of tidal or coastal flooding.
Fluvial	Medium	The SEPA Flood Map shows that fluvial flood extents associated with the watercourses crossed by the Proposed Development are localised in extent and do not extend significantly beyond the watercourses. Areas of high risk are crossed by the Proposed Development as detailed in **Table 11.17**. With the implementation of appropriate crossing design in accordance with SEPA guidance this is not considered a significant constraint.
Pluvial	Low	The SEPA Flood Map shows that localised areas of pluvial flooding occur in topographic low points. Pluvial flooding will be mitigated by best practice design measures and mitigation and is not considered a design constraint.
Groundwater	Negligible	The SEPA groundwater flood map (within the Flood Risk Management Maps) illustrates that the Proposed Development is not considered at risk from potential groundwater flooding.

Flooding Source	Potential Risk	Justification
Flood Defence Breach	Negligible	The Proposed Development does not benefit from the protection of any flood defences.
Artificial Drainage	Negligible	The Proposed Development is located remote from any artificial drainage systems.
Reservoirs	Negligible	The SEPA Reservoir Flood Map shows the Proposed Development is not located within modelled flood extents in the event of a reservoir breach.

Study Area Alterations

11.2.51 The 1 km buffer suitably captures all potentially impacted sensitive receptors along Section E of the Proposed Development. No alterations to the Study Area are needed for Section E.

11.3 Sensitive Receptors

11.3.1 The sensitive receptors identified based on the preferred route options that will be assessed in the EIA Water Environment chapter are listed below. As part of the EIA Report Water Environment chapter the scope of sensitive receptors will be refined based on the proposed alignment, and a detailed Area of Influence will be developed. The scoping assessment has identified the following sensitive receptors:

- WFD Watercourses;
- Groundwater bodies/aquifers;
- Flood risk areas;
- PWS;
- Public Water Supplies;
- Statutory designated sites; and
- GWDTEs.

11.4 Mitigation

11.4.1 Analysis and interpretation of data gathered during the assessment process would ensure that the Proposed Development and associated works are carefully sited to ensure potential effects on the water environment are minimised where practicable through design.

11.4.2 Watercourse buffers detailed in SEPA's Recommended Riparian Corridor[136] will, where practicable, be implemented. These are shown in **Table 11.21**. Where required the width of the watercourse will be ground truthed using results from the field based survey with the appropriate buffer based on the observed watercourse channel width to be applied. Where channel widths observed during the field based survey differ to those detailed in the SEPA guidance, evidence such as field survey notes and images will be provided as part of the EIA Report chapter.

Table 11.21: SEPA's Guidance on Watercourse Buffers

Channel Width	Width of Buffer Strip (either side)
Less than 2m	10m
2-15m	15m
More than 15m	30m

[136] SEPA (2024) Recommended Riparian Corridor [Online]. Available at: https://www.sepa.org.uk/environment/environmental-data/ (Accessed 24/09/2024)

11.4.3 SEPA guidance[137] requires that any GWDTE within 250 m of any excavation that exceeds 1 m in depth is assessed to determine whether the construction of below ground works may change the quantity or quality of the groundwater supplying the receptor.

11.4.4 Embedded mitigation measures will be outlined within the Water Environment chapter of the EIA Report and within SSEN Transmission's standard GEMPs. The GEMPs comprise good practice construction methods and works that are established and effective measures to which the SSEN Transmission will be committed throughout the development process. The following GEMPs will be relevant to the water environment:

Working in or Near Water (TG-NET-ENV-512:)

- Section 3.1: General Compliance
  - Plan all works in accordance with best practice.
  - Ensure all necessary authorisations under the Controlled Activities Regulations (CAR) are in place.
  - Avoid works within 10 m of a watercourse unless no other practical options exist and leave a vegetated buffer strip. Where works are undertaken within 10 m of any watercourse or drain, ensure specific pollution prevention controls are in place.
  - Ensure that all watercourses are routinely monitored for changes in water quality. If water quality deteriorates, stop works, identify the source of the problem and implement appropriate mitigation measures.
- Section 3.3: Surface water control
  - Locate areas of high-risk activities away from watercourses and drainage paths.
  - Minimise the volume of contaminated run-off being created.

Working in Sensitive Environments (TG-NET-ENV-513):

- Section 2.1 General compliance requirements
  - Consider effects of local hydrology factors (drainage, watercourses, flushes, bog pools, peatlands etc) on established habitats and seek to maintain hydrology regimes during the works.
  - If hydrological impacts cannot be avoided or significantly mitigated through design and implementation, ensure hydrological connectivity is re-stablished as soon as possible. Ensure development or reinstated areas do not form preferential drainage.

Watercourse Crossings (G-NET-ENV-515):

- Section 3.1: General compliance requirements
  - Seek to avoid watercourse engineering works wherever possible.
  - Where this is not possible, seek to use existing crossings, upgrading as required.
  - Design crossing to account for maximum flow conditions.
  - Ensure all necessary authorisations under the CAR are in place and adhered to.
- Section 3.2: Construction
  - Where possible, works should be undertaken during drier periods (subject to other ecological timing conditions) and avoid periods of high rainfall. The weather forecast should be consulted three days in advance of works commencing the water crossing.
  - During construction and use of the crossing, measures must be taken to prevent the transport of sediments or other materials into the watercourse, for example using correctly installed silt fencing.

[137] Land Use Planning System SEPA Guidance Note 31

Private Water Supplies (TG-NET-ENV-518):

- Section 2.1: Pre-construction
  - All PWS located within 250 m of the proposed works must be identified prior to commencement of any works.
  - A risk assessment should be undertaken to identify those PWS that have the potential to be affected by the works.
- Section 2.2: Construction
  - PWS requiring protection will have specific mitigation developed.
  - Regularly monitor works and their impact on the PWS. If the PWS is being impacted or has the potential to be impacted, stop those activities and seek specialist advice.
- Section 2.3: Unidentified Water Supplies
  - It is possible that previously unidentified PWS may be found during works. If this happens, stop work in that location and seek specialist advice.
  - Necessary protection measures will need to be identified in consultation with the PWS owner, landowner, specialists and relevant authorities and implemented before work should resume in that location.

11.4.5 Where necessary, and informed by the assessment of potential impacts, additional mitigation measures to manage any residual risks will be identified.

11.5 Issues Scoped Out

WFD Assessment

11.5.1 The construction of the Proposed Development will be undertaken following the measures outlined in the GEMPs listed in **Section 11.4**. These documents include an approach to route selection that avoids crossing important waterbodies, ensuring that as far as is reasonably practicable the construction contractor will only cross lower value watercourses.

11.5.2 This construction methodology has been adopted as embedded mitigation, to ensure that there is no deterioration in the current ecological status of WFD waterbodies as a result of the Proposed Development. As such, it is considered that a formal WFD compliance assessment will not be required and can be scoped out of the assessment.

Flood Risk Assessment

11.5.3 A flood risk summary table is included for each section of the Proposed Development which shows the construction of the Proposed Development will require the erection of towers through mapped river, coastal and surface water flood zones. The construction of the Proposed Development will avoid areas with groundwater flood risk. The impact on flood risk to the OHL itself and the surrounding areas is considered negligible. Suitable mitigation measures, outlined in **Section 11.4**, will ensure no significant impacts arise from the obstruction of watercourses during construction and associated forestry works, and increased runoff due to soil compaction and additional impermeable surfaces.

11.5.4 Once the Proposed Development is constructed, the towers will have a negligible impact on flood levels, flow velocities and available floodplain storage volumes, and as such, will not pose an increased risk of flooding. However, as part of the assessment in the Water Environment chapter in the EIAR, there will be a review of any localised areas where towers and access tracks may be located within SEPA flood zones. It is anticipated that no other infrastructure would be located within SEPA flood zones.

11.5.5 The Proposed Development will not require the construction of any areas of new permanent hardstanding which could result in a significant increase in surface water runoff, and as such a flood

risk assessment for the construction and operation of the proposed scheme is not considered necessary. It is therefore considered appropriate for this assessment to be scoped out.

Chemical Pollution and Sedimentation of Surface Water and Groundwater from Construction Works

11.5.6 Watercourses and groundwater bodies could be at risk from a pollution incident through leakage or spillage of chemicals, fresh concrete, fuels or oils during use or storage onsite during the construction of the Proposed Development.

11.5.7 Pollutants coming into contact with bedrock also have the potential to indirectly alter the quality of the groundwater resource. pH and chemical alterations to groundwater are difficult to rectify due to the fractured nature of the rock and the lengthy attenuation and dispersal of chemicals.

11.5.8 Best practice construction practice measures will be implemented onsite and secured through the SSEN GEMPs to protect surface water and groundwater from construction pollution, with the following GEMPs to be implemented throughout the construction stage to manage pollution from spillage and leakage:

- Oil Storage and Refuelling GEMP;
- Soil Management;
- Working in or Near Water;
- Working with Concrete; and
- Waste Management.

11.5.9 Therefore the introduction of the measures detailed within the GEMPs will mitigate the potential risk of chemical pollution of surface water and groundwater during the construction stage, and it is considered appropriate for this effect to be scoped out of the assessment.

Acidification of Watercourses as a Result of Construction Works

11.5.10 Large scale felling of forestry and the storage of brash could potentially result in a short-term increase in the acidity and water quality of watercourses within the immediate catchment, principally through increased rates of mineralisation, nitrification and nitrate leaching, and potential decline in acid neutralising capacity. Felling will involve the movement of heavy machinery and plant across the surface which has the potential to lead to soil compaction and disturbance, which could have the potential to lead to acidification and sedimentation runoff to surface watercourses.

11.5.11 Forestry good practice measures will be implemented during the construction phase and secured through the Forestry GEMP, with measures within the Forestry GEMP incorporating standards set out in the Forestry Commission publication 'Managing Forest Operations to Protect the Water Environment[138].

11.5.12 The introduction of the measures detailed within the Forestry GEMP will remove the scope for any significant effects resulting from felling on watercourse quality and acidity, and it is considered appropriate for this effect to be scoped out of the assessment.

Changes in Groundwater Flow Patterns Outwith of the Defined Radii of Influence

11.5.13 As detailed in paragraph 11.2.16 the radius of influence on groundwater from the excavations required as part of the Proposed Development will be calculated using Sichardt's Formula and it is proposed that any groundwater receptors or impacts to groundwater flow patterns outwith of the radii of influence will be scoped out.

[138] Forestry Commission (2019). Managing Forest Operations to Protect the Water Environment. Available online at: https://www.confor.org.uk/media/247469/fcpg025.pdf

11.6 Potential Significant Effects

11.6.1 It is expected that all effects associated with the operational and decommissioning phases are similar to, and of lower magnitude than, those identified within the construction phase and that there will be no long-term effects from the operational and decommissioning phases of the Proposed Development.

11.6.2 Effects which are considered to have the potential to be significant on the sensitive receptors are detailed below:

- Impacts on public water supply catchments and PWS both in terms of water quality, quantity, and security of supply;
- Increases in watercourse flow as a result of related tree felling;
- Impediments to watercourse flows from crossings; and
- Modifications to groundwater conditions, including levels and flows, which may cause alteration to receptors such as GWDTE or groundwater-fed water supplies within the defined groundwater radii of influence for each section of the Proposed Development.

11.7 Assessment Methodology

11.7.1 The significance of the impacts upon the baseline water environment will be defined as a function of the sensitivity of receptors and the magnitude of change. The impact assessment will be undertaken in accordance with the EIA Regulations and follow the significance criteria provided in **Chapter 3: EIA Approach and Methodology**.

11.7.2 This assessment will also include the impacts of any works required to facilitate the Proposed Development upon the baseline water environment. Particular attention will be paid to the potential hydrological and water quality impacts upon any surface water and groundwater supplies within the vicinity of the Proposed Development and any ecological features identified within the ecology chapter (**Chapter 7: Ecology and Nature Conservation**). The potential water quality impacts through enhanced erosion of disturbed peat will also be considered.

11.7.3 Consultation with THC will verify the online open data private water supply mapping and confirm any additional private water supplies which need to be considered.

11.7.4 As the Proposed Development results in access tracks crossing watercourses a watercourse crossing schedule will be conducted and provided as part of the EIA Report. This involves the identification of all required new watercourse crossings and assessment of the quality of current watercourse crossings through an on-site walkover study where crossings will occur. This study will include a photo of the watercourse, as well as details on hydrological features of the watercourse such as width, bed sediment, catchment area, if bank erosion occurs, and whether it is a natural channel or not. The type of crossing will be determined and whether CAR authorisation is required. If infrastructure near watercourses is within the SEPA recommended riparian buffers shown in **Table 11.21** then mitigations will be suggested to avoid impacting quality, quantity and/or continuity of the water.

11.7.5 A questionnaire has been issued to local residents and landowners to obtain details on PWS within 250 m of the Proposed Development, including the type, source and use of abstractions. Responses from the questionnaire relating to PWS of residents/ property owners in the areas will infer if further action regarding PWS is required. If the PWS source is within 100 m or 250 m of excavations (depending on excavation depth), then a PWS Risk Assessment (PWSRA) will be conducted as part of the EIA in accordance with SEPA guidelines. This involves a desk-based hydrological assessment to ensure that all infrastructure and activities in hydrological connectivity with water supply source, distribution infrastructure, and supply are identified. An assessment to determine if the Proposed Development is likely to change the quality, quantity and/or continuity of water at the receptor will be conducted. If a PWS supply is at risk, it will be highlighted, and mitigation measures will be

recommended. A site-based survey will be conducted on the PWS, which if required, will include discussion with resident/ property owners.

11.8 Summary

11.8.1 SSEN Transmission will provide an EIA Report which will include a standalone chapter to assess potential significant effects related to the water environment which will define the sensitivity of receptors and potential effects in accordance with the approach detailed within this chapter.

11.8.2 SSEN Transmission GEMPs will cover the proposed mitigation for the scheme in relation to impacts to the water environment during construction.

12. TRAFFIC AND TRANSPORT

12.1 Introduction

12.1.1 This chapter describes the baseline traffic and transport conditions and the potential effects on the existing transport network and on sensitive receptors as a result of the construction and operation phases of the Proposed Development.

12.1.2 Vehicle movements to the Proposed Development will mostly consist of Heavy Goods Vehicle (HGV), Light Goods Vehicles (LGV) and private cars. The traffic, transport and access chapter will:

- Address potential disruption to pedestrians, cyclists and existing road users during the construction and operational phase;
- Assess changes to local traffic flows during the construction phase;
- Assess the effect of the changes on the transport network and the level of significance of any effects established;
- Identify measures to mitigate any significant adverse effects (where practicable); and
- Take account of the objectives of the local and strategic policy.

12.2 Baseline Conditions

12.2.1 The Study Area has been defined as the public road network in the vicinity of the Proposed Development and the potential delivery corridors to be used by construction traffic, including staff. The Study Area will also be consulted on separately with THC.

12.2.2 **Table 12.1** below sets out the main roads on the local road network that are likely to be used by construction traffic linked to the proposed development. While the Proposed Route crosses a number of classified roads, including the A9 which forms part of the trunk road network, the OHL will pass through predominantly rural areas. Construction activities will be supported by the use of existing roads and forestry tracks where practicable, with new stone tracks constructed where necessary. Existing bellmouth access junctions would be utilised where possible, subject to improvements. It is acknowledged that new bellmouth access junctions would likely be required at some locations. All new access junctions will be designed in accordance with THC design standards and the Design Manual for Roads and Bridges (DMRB) where appliable.

Table 12.1: Local Road Network

Section	Local Road Network	Anticipated Construction Access Requirements
Section A – Spittal to Brora	A9, B870, A897, C1065 and other minor roads/tracks providing localised access.	.Existing access junctions would be utilised where possible or would be upgraded wherever necessary to accommodate construction traffic.
Section B – Brora to Loch Buidhe	A9, A839, Gordonbush Road, Lochbuie Road and other minor roads/tracks providing localised access.	Existing access junctions would be utilised where possible or would be upgraded wherever necessary to accommodate construction traffic. The use of helicopters for the delivery of materials would also be considered where necessary to minimise the number of vehicular accesses required, and therefore reducing the requirement for new tracks.
Section C – West of Dornoch	A836, A837, A949, Airdens Road, Migdale Road and other minor roads/tracks providing localised access.	Existing access junctions would be utilised where possible or would be upgraded wherever necessary to accommodate construction traffic. The use of helicopters for the delivery of materials would also be considered where necessary to minimise the number of vehicular accesses required, and therefore reducing the requirement for new tracks.

Section	Local Road Network	Anticipated Construction Access Requirements
Section D – Dornoch to Dingwall	A834, A835, B9176, Boath Road, Strath Rusdale Road and other minor roads/tracks providing localised access.	Existing access junctions would be utilised where possible and would be upgraded wherever necessary to accommodate construction traffic.
Section E – Dingwall to Beauly	A831, Aconochie and other minor roads/tracks providing localised access.	Existing access junctions would be utilised where possible and would be upgraded wherever necessary to accommodate construction traffic.

12.2.3 Thera are a number of core path networks which cross the preferred routes. These include:

- Section A: Acnaclyth track by Toutnagoul;
- Section B: The Drove Road, Loch Brora West Track, Torboll – Elden;
- Section C: Cornhill – Culrain, Balblair Wood – Invershin, Blablair Forest Walk, Lochcoire, Lower Track;
- Section D: Kinellan – Strathgarve, River Carron, Loch Kinellan Circuit, Main of Coul; and
- Section E: Orrin Circular – Fairburn, Orrin Dam Track.

12.2.4 The Proposed Development crosses the Inverness to Thurso/Wick railway line in:

- A north-south direction to the north of Helmsdale in Section A;
- An east-west direction to the north of The Mound in Section B; and
- A north-south direction to the north of Bonar Bridge in Section C.

12.2.5 The Proposed Development crosses the Dingwall to Kyle of Lochalsh railway line in an east-west direction to the west of Dingwall and to the west of Tarvie in Section D.

12.3 Sensitive Receptors

12.3.1 The following sensitive receptors have been identified and will be considered within the EIA:

- Motorised users of the surrounding highway network, including vehicle drivers and public transport users;
- Non-motorised users of the surrounding highway network, which includes all users of core path networks and non-designated public routes, including pedestrians, cyclists, and vulnerable groups;
- Single track roads with passing places; and
- Communities within the Study Area.

12.4 Issues Scoped Out

12.4.1 Potential effects which have been scoped out for further assessment are listed below.

Operational Traffic

12.4.2 The potential for the proposed development to give rise to traffic impacts would be limited to the construction phase only. No impacts are anticipated during the operational phase as the Proposed Development would not generate any new traffic, except during the infrequent maintenance activities using cars or LGV. Therefore, it is proposed that the operational traffic assessment is scoped out of the EIA.

Noise and Vibration

12.4.3 Impacts relating to noise and vibration due to increased HGV movements within the Study Area would be temporary during the construction phase. It should be noted that the need for an assessment of the noise and vibration impacts of construction traffic will be considered as part of the noise vibration assessment (see **Chapter 13: Noise and Vibration**). As outlined in the previous section, no impacts

are anticipated during the operational phase and therefore the assessment of operational noise as a result of road traffic is proposed to be scoped out of this chapter.

Air Quality

12.4.4 The Institute of Environmental Management and Assessment (IEMA, 2023) Guidelines for the Environmental Assessment of Road Traffic[139] advise that significant impacts to local air quality may occur if changes to LGVs exceed 100 Annual Average Daily Traffic (AADT) movements within or adjacent to an Air Quality Management Area (AQMA) and 500 AADT movements elsewhere. For HGVs, the criteria are 25 AADT movements within or adjacent to an AQMA, and 100 AADT movements elsewhere. Based on the expected volume of construction traffic, none of the above criteria will be met or exceeded. In addition, the Proposed Development is not located within an AQMA and, due to the temporary nature of the increase in vehicles using the proposed access route, any effects on local air quality will be short term and reversible.

Visual Effects

12.4.5 The movements of HGVs are not considered to be visually intrusive as they are typical standard vehicles and any effects will be short term, fully reversible and would only occur during construction hours. Any likely significant environmental effects relating to visual effects due to traffic generated during the construction phase of the Proposed Development is considered within the landscape and visual amenity assessment (see **Chapter 6: Landscape and Visual Amenity**). The assessment of visual effects has therefore been scoped out of this chapter.

12.5 Potential Significant Effects

12.5.1 The precise details of the construction programme, including required items of plant, are unknown at this stage. However, the impacts of construction traffic have the potential to result in significant effects at nearby receptors, and therefore the likely effects for Traffic and Transport associated with the construction phase which will be assessed as part of the EIA are as follows:

- Severance of communities;
- Fear and Intimidation on and by Road Users;
- Road user and pedestrian safety;
- Road vehicle driver and passenger delay;
- Non-motorised user amenity;
- Non-motorised delay; and
- Hazardous and large loads.

12.6 Assessment Methodology

12.6.1 An assessment will be carried out as part of the EIA to include the likely number of construction traffic movements and the capacity of local roads to accommodate construction traffic.

12.6.2 The assessment will be completed with reference to the best practice guidelines detailed below in addition to other related technical and planning guidance and in consultation with THC and Transport Scotland:

- The Transport Assessment Guidance[140] (Scottish Government, 2012);
- Highland Council's Transport Assessment Guidance[141];

139 Institute of Environmental Management and Assessment (IEMA) (2023). IEMA Guidelines: Environmental Assessment of Traffic and Movement

140 The Scottish Government (2012) Transport Assessment Guidance [Online] Available at https://www.transport.gov.scot/media/4589/planning_reform_-_dpmtag_-_development_management__dpmtag_ref__17__-_transport_assessment_guidance_final_-_june_2012.pdf . (Accessed on 22/12/2023)

141 The Highland Council (2014) Guidance on the preparation of Transport Assessments [Online] Available at http://www.highland.gov.uk/download/downloads/id/12194/guidelines_for_transport_assessments.pdf. (Accessed 22/08/2023)

- Guidelines for the Environmental Assessment of Traffic and Movement[142] (IEMA, 2023);
- National Planning Framework 4[143] (Scottish Government, 2023) Part 2, Policy 13 on Sustainable Transport; and
- Planning Advice Note (PAN) 75[144] Planning for Transport (Scottish Government, 2005).

12.6.3 The scope of the assessment will be agreed with Transport Scotland and THC once the estimated trip generation during construction has been finalised.

12.6.4 Baseline traffic flows will be sought from THC, Transport Scotland, and the Department for Transport (DfT) open traffic count site; however, this is unlikely to include the minor roads. Should new traffic count data be deemed necessary, these would be obtained through the use of a week-long deployment of Automatic Traffic Counters at locations to be established during detailed transport discussions with THC and Transport Scotland. For the purposes of the EIA, the identified baseline traffic flows will be adjusted to an agreed future baseline using National Road Traffic Forecast (NRTF) estimates.

12.6.5 Accident data for the road network within the identified study area would be sourced from Crashmap.co.uk (an online accident review resource) , Transport Scotland for trunk roads, and THC for the Council maintained roads where possible. .

12.6.6 In accordance with the IEMA (2023) Guidelines for the Environmental Assessment of Road Traffic, an assessment should be undertaken:

- Rule 1: On road links where traffic flows are predicted to increase by more than 30% (or where the number of heavy goods vehicles is predicted to increase by more than 30%); and
- Rule 2: On road links where traffic flows are predicted to increase by 10% or more in any other specifically sensitive areas.

12.6.7 Where the relevant thresholds are exceeded, an assessment will be provided as part of the EIA to include the likely number of construction traffic vehicle movements, and the capacity of local roads to accommodate construction traffic, with reference to the potential effects of severance, fear and intimidation, road safety, driver delay, non-motorised user amenity, and pedestrian delay.

12.6.8 Where thresholds for potential significant effects are not exceeded, detailed assessments are not required; however, embedded mitigation will be provided within the EIA Report, along with a commitment to work with Transport Scotland and THC in order to agree detailed traffic management proposals for implementation during the construction phase.

12.6.9 Once the environmental and population impacts and the road links to be included within the analysis have been identified, the next stage of the assessment is to quantify the magnitude of the environmental impact and to identify the scale and nature of the effect to determine the level of significance that such change may have. The magnitude of potential change will be identified through the following:

- Consideration of the Proposed Development;
- The degree of change to baseline conditions predicted as a result of the Proposed Development;
- The duration and reversibility of an effect;

142 Institute of Environmental Management and Assessment (IEMA) (2023). IEMA Guidelines: Environmental Assessment of Traffic and Movement
143 The Scottish Government (2023) National Planning Framework 4 [Online] Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/02/national-planning-framework-4/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4.pdf (Accessed 22/12/2023)
144 The Scottish Government (2005). Planning Advice Note, PAN 75, Planning for Transport. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/publication/2005/08/planning-advice-note-pan-75-planning-transport/documents/0016795-pdf/0016795-pdf/govscot%3Adocument. (Accessed on 22/12/2023)

- Professional judgement; and
- Best practice guidance (IEMA, 2023) and legislation.

12.6.10 A combination of the sensitivity of the receptor and the magnitude of impact would then be used to identify the significance of the effect as outlined in **Chapter 3: EIA Approach and Methodology**. For many effects there are no simple rules or formulae which define thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed up by data or quantified information where possible.

Cumulative Effects

12.6.11 In accordance with guidance, the assessment will consider the potential for any significant cumulative effects that may occur in combination with other consented, and/or in planning, traffic-generating developments that exist within the identified study area. Consultation will be undertaken with THC to establish where significant cumulative effects may occur, and with which developments.

Abnormal Load Assessment

12.6.12 It is possible, although highly unlikely, that Abnormal Indivisible Load (AIL) deliveries will be required. If such need arises it is anticipated that these loads can be divided into constituent components and reassembled on site to avoid the need for AIL vehicles. In the event this cannot be achieved, further routing studies and swept path analysis will be undertaken.

Transport Assessment

12.6.13 A Transport Assessment (TA) will be prepared. The TA and the EIA would utilise the same baseline data; however, the TA will be prepared in accordance with its own relevant guidance and best practice and will be subject to a separate scoping exercise with the relevant authority. It will focus on the ability of the surrounding highway network to accommodate traffic associated with the Proposed Development.

Mitigation

12.6.14 The Traffic and Transport EIA chapter will provide details of standard mitigation where appropriate in the form of an Outline Construction Traffic Management Plan (oCTMP). Additional mitigation may be included should the assessment identify effects that are significant following the application of standard mitigation.

12.6.15 It is acknowledged that road improvement works may be required in constrained locations to reduce the impact of construction traffic and allow construction vehicle access. The assessment of routes from the major road to the tower locations via minor roads will determine the feasibility of routes and where mitigation works are required. The design of suitable access arrangement will take into account the safety of all users.

12.7 Summary

12.7.1 There is only the potential for effects from traffic and transport during the construction phase of the Proposed Development. Once the trip generation data have been agreed, the final scope of the assessment, including plans for baseline data collection, will be discussed with Transport Scotland and THC.

13. NOISE AND VIBRATION

13.1 Introduction

13.1.1 This chapter provides a brief overview of the noise and vibration baseline conditions, the potential effects associated with the construction and operation of the Proposed Development and the proposed scope of assessment methodology to be considered in the EIA Report.

13.2 Baseline Conditions

Summary of Baseline

13.2.1 The Proposed Route is located within a predominantly rural area. The exact alignment is not known at time of writing, but the main areas within the vicinity of the Proposed Route include (from north to south) Spittal, Dunbeath, Helmsdale, Borgue, Rogart, Invershin, Dounie, Pittentrail, Glensgiach Strathpeffer, Contin, Marybank, Fairburn, and Beauly.

Sensitive Receptors

13.2.2 Noise sensitive receptors (NSRs) are defined in the context of this assessment as residential properties located within 500 m of a nominal centreline of the Proposed Route. Following confirmation of the OHL's Proposed Alignment and once conductor and tower information are known, calculations will be conducted to determine a distance from the OHL centreline beyond which noise impacts are not likely at NSRs. Where the OHL alignment is located in proximity to properties in groups or close to settlements, one location may be chosen as being representative of several properties that would produce duplicate readings. The noise assessment conducted for these properties will be based on the predicted highest (worst case) noise impact from the Proposed Development, and therefore if the chosen properties meet noise criteria, then any property at greater distances will also pass the criteria.

13.2.3 Detailed ordinance survey maps, AddressBase data, and satellite imagery will be used to identify the potential NSRs. Receptors chosen will be representative of the closest residential properties surrounding the Proposed Development, and measurement locations agreed with the Local Authority prior to measurement.

13.3 Potential Significant Effects

13.3.1 At this scoping stage, the potential significant effects associated with construction and operation of the Proposed Development are described in the following subsections.

Construction Noise and Vibration

13.3.2 There is the potential for construction noise and vibration impacts from static, quasi static and mobile plant items carrying out construction activities including:

- installation of, and stringing of, electricity towers, potentially including tree felling and the use of cranes
- plant movements creating traffic noise on access tracks
- any potential vibration effects that would be from construction of the foundations and associated plant and machinery. If rock breaking is required, the potential for vibration effects will be increased. Similarly, the potential for effects increases for peat removal and / or rotary piling during the construction of foundations.

Operational Noise

13.3.3 OHL noise is generally associated with a phenomenon known as "corona discharge". This is essentially a limited electrical breakdown of the air which, in the main, occurs during damp weather. Corona discharge will create a source of audible noise (a crackling sound occasionally accompanied

by a low frequency hum in certain wet conditions). Power transmission line conductors are designed to minimise corona discharge, but this may be affected by minor surface irregularities caused by damage, insects, raindrops, or pollution. The highest noise levels generated by an OHL usually occur during light rain when water droplets, collecting on the surface of the conductor, can initiate corona discharge. The number of droplets that collect, and hence the amount of noise, depends on the rate of rainfall.

13.3.4 Aeolian noise is caused by wind blowing through the conductors and / or structures. This type of noise is usually infrequent and depends on wind velocity and direction. Aeolian noise is caused by wind blowing over a structure resulting in vibration that matches that the natural frequency of the structure, or vortex shedding on the surface of a structure. There is currently not a standardised method to predict this type of noise, therefore it is difficult to assess. Dampers can be attached to the lines to minimise aeolian noise.

13.4 Mitigation

13.4.1 As part of the impact assessment process, mitigation measures may be identified to reduce the level of predicted noise impacts, particularly where this is necessary to avoid significant adverse effects. Two types of measure can be distinguished, as follows:

- mitigation measures, aimed at managing potential impacts of moderate or major significance to reduce residual effects to an acceptable level; and
- measures including adoption of good practice aimed at managing potential effects of minor significance.

Mitigation During Design

13.4.2 The type of conductor used and the alignment of the OHL is intended to consider potential noise impacts, and avoid potential adverse impacts where possible.

13.4.3 There is no method for the prediction or assessment of potential aeolian noise impacts. Therefore, aeolian noise should be anticipated and mitigated in the design of the Proposed Development. A proactive approach to mitigation must be taken. To avoid potential issues with aeolian noise, the OHL tower structure should avoid using components which have been previously known to emit aeolian noise. Where possible, a statement from manufacturers should be sought that components used do not produce significant aeolian noise. Components that are likely to cause this noise include, but not limited to; insulators, dampers, conductors.

13.4.4 Mitigation During Construction

13.4.5 The felling works of the Proposed Development have the potential to cause impacts, however, effects would be temporary. British Standard (BS) 5228 2009 +A1:2014 provides recommended limits for noise from construction sites to meet a maximum 65 dB limit at receptors. The mitigation required would likely involve restricting the working hours to daytime weekdays.

13.4.6 Even if the construction noise limit is met, it is best practice that construction noise should continue to be controlled with a Construction Noise Management Plan (CNMP). In accordance with the guidance and procedures outlined in BS 5228-1 a CNMP may include:

- minimising the noise as much as is reasonably practicable at source
- attenuation of noise propagation
- carrying out identified high noise level activities at a time when they are least likely to cause a nuisance to residents
- providing advance notice of unavoidable periods of high noise levels to residents.

13.4.7 In order to maintain low impact on the noise environment, consideration will be given to attenuation of construction noise at source by means of the following:

- giving due consideration to the effect of noise, in selection of construction methods
- avoidance of vehicles waiting or queuing, particularly on public highways or in residential areas with their engines running
- scheduling of deliveries to arrive during daytime hours only wherever possible. Care should be taken to minimise noise while unloading delivery vehicles. Delivery vehicles should follow routes that minimise use of residential roads
- ensure plant and equipment are regularly and properly maintained. All plant should be situated to minimise sufficiently noise impact at nearby properties
- fit and maintain silencers to plant, machinery, and vehicles where appropriate and necessary
- operate plant and equipment in modes of operation that minimise noise, and power down plant when not in use
- use electrically powered plant rather than diesel or petrol driven, where this is practicable
- working typically will not take place outside of hours defined in the construction schedule.

13.4.8 Consideration will be given to the attenuation of construction noise in the transmission path by means of the following:

- locate plant and equipment liable to create noise as far from noise sensitive receptors as is reasonably practicable or use natural land topography to reduce line of sight noise transmission
- noise screens, hoardings and barriers should be erected where appropriate and necessary to shield high-noise level activities
- provide lined acoustic enclosures for equipment such as static generators and when applicable portable generators, compressors and pumps

13.4.9 In setting working hours, consideration is given to the fact that the level of noise through the normal working day is more easily tolerated than during the evening and night-time. As the work is short term in nature, working can continue into the evenings, as long as the noise limits are adhered to.

Mitigation During Operation

13.4.10 If mitigation is required during operation of the Proposed Development, the first stage would be to change the source of noise, the conductor, to a lower noise conductor that still fulfils the power transfer requirements of the overhead line. If the conductor type cannot be changed, then conductors can be aged or bead-blasted to reduce noise at the source.

13.5 Preliminary Assessment of Likely Significant Effects

13.5.1 Construction activities and traffic, as well as felling required to form an Operational Corridor for the OHL, have the potential to cause noise and vibration impacts on NSRs during the construction phase. A CNMP will be necessary to mitigate any predicted effects, which could include measures such as limiting working hours. However, due to the uncertainties around OHL alignment and siting of towers and conductors at this stage, it is proposed that noise and vibration effects during construction are included in the EIA and reported in the EIAR.

13.5.2 Operational noise may be emitted from OHL conductors via a phenomenon known as “corona discharge”, these effects will be considered and evaluated in the EIA and the findings, including any predicted significant residual effects, reported in the EIAR.

13.5.3 There are no known vibrational noise issues associated with the operation of the Proposed Development at nearby NSRs.

Issues Scoped Out

13.5.4 As noted above, commissioned OHL does not produce vibration effects as part of operation; hence operational vibration is scoped out of the assessment.

13.6 Proposed Scope and Assessment Methodology

Proposed Scope of Assessment

13.6.1 The assessment methodology has not been discussed with THC and the Environmental Health Officer (EHO) to date. The EHO will be consulted to confirm that the following methodology of assessment is appropriate.

13.6.2 Additional mitigation measures will be outlined where required, should there be any significant impacts at the noise sensitive receptors.

Assessment Methodology

Surveys

13.6.3 A survey of the background (LA90,T) ambient noise (LAeq,T), and 1/3rd octave band spectrum levels will be conducted to determine the existing noise level in the area and at any nearby noise sensitive receptors (NSRs) likely to be affected by the noise in accordance with TGN(E)322 and BS5228. To ensure that values are reliable and representative of the outdoor amenity of NSRs, attended spot measurements will be conducted in suitably dry conditions and very low wind. Measurements at NSRs will be conducted within a calculated distance from the nominal centreline of the Proposed Alignment, beyond which impacts are unlikely.

Construction Noise Assessment

13.6.4 The assessment of construction noise will comply with the following standards and guidance.

British Standard 5228-1:2009 +A1:2014 (BS5228), Code of Practice for Noise and Vibration Control on Construction and Open Sites.

13.6.5 Guidance on the prediction and assessment of noise and vibration from construction sites is provided in British Standard (BS) 5228 2009 +A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise. BS5228-1 provides recommended limits for noise from construction sites.

13.6.6 The Construction Noise Impact Assessment (CNIA) would be carried out according to the ABC method specified in Table E.1 of BS5228-1, in which noise sensitive receptors (NSRs) are classified in categories A, B or C according to their measured or estimated background noise level.

13.6.7 In line with best practice (BS 5228-1), a CNMP will be developed by the Principal Contractor prior to starting construction works. The details of the CNMP will be agreed with THC and is expected to be secured by an appropriately worded condition of consent.

Operational Noise Assessment

13.6.8 The assessment of operational noise will comply with the following standards and guidance.

Planning Advice Note (PAN) 1/2011: 'Planning and Noise'

13.6.9 Published in March 2011, this document provides advice on the role of the planning system in helping to prevent and limit adverse effects of noise. Information and advice on noise assessment methods are provided in the accompanying Technical Advice Note (TAN): Assessment of Noise. Included within the PAN document and the accompanying TAN are details of the legislation, technical standards, and codes of practice for specific noise issues.

13.6.10 Neither PAN 1/2011 nor the associated TAN provides specific guidance on the assessment of noise from fixed plant, but the TAN includes an example assessment scenario for 'New noisy development

(incl. commercial and recreation) affecting a noise sensitive building', which is based on BS 4142:1997: Method for rating industrial noise affecting mixed residential and industrial areas. This British Standard has been replaced with BS 4142:2014: Methods for rating and assessing industrial and commercial sound.

13.6.11 British Standard 4142:2014+A1:2019: Methods for rating and assessing industrial and commercial sound (BS 4142)

13.6.12 British Standard 4142 describes methods for rating and assessing the following:

- sound from industrial and manufacturing processes;
- sound from fixed installations which comprise mechanical and electrical plant and equipment;
- sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train movements on or around an industrial and/or commercial site.

13.6.13 The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

13.6.14 In accordance with the assessment methodology, the specific sound level (LAeq,T) of the noise source being assessed is corrected, by the application corrections for acoustic features, such as tonal qualities and / or distinct impulses, to give a "rating level" (LAr,Tr). The British Standard effectively compares and rates the difference between the rating level and the typical background sound level (LA90,T) in the absence of the noise source being assessed.

13.6.15 The British Standard advises that the time interval ('T') of the background sound measurement should be sufficient to obtain a representative or typical value of the background sound level at the time(s) when the noise source in question is likely to operate or is proposed to operate in the future.

13.6.16 Comparing the rating level with the background sound level, BS 4142 states:

- "*Typically, the greater this difference, the greater the magnitude of impact.*
- *a difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- *a difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
- *the lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context*."

TGN(E)322 – Operational Audible Noise Assessment Process for Overhead Lines

13.6.17 The National Grid has derived a procedure to assess the impact of OHL noise in both dry and rainy conditions. The guidance of the British Standard BS 4142: 2014 can also be used to assess the impact of the noise from a specific industrial source at NSRs.

13.6.18 The procedure requires a series of assessments to be conducted in tiers. Tier 3 requires that the background noise (BGN) at NSRs within a set distance from the OHL (usually 500 m) be measured during quiet night times and in dry conditions with little wind. The nature of the ground surface around the sensitive receptors is noted so that the contribution to BGN of the surface noise attributable to the rainfall can be derived from empirically derived curves (Miller curves). The logarithmic sum of the measured BGN and the empirically derived contribution for rainfall is adopted as the BGN level, in

rainy conditions, against which to compare the predicted received noise from the OHL. Using the parameters provided in TGN(E)322 the likelihood of an adverse impact can be assessed.

13.6.19 The assessment procedure follows TGN(E)322, and has been conducted in the following stages:

- The outcome of the Tier 1 assessment will determine whether the 'worst case' wet noise impact is predicted to be acceptable, or whether further assessment is required.
- The outcome of the Tier 2 assessment will determine whether the combined wet and dry noise impact is acceptable, or whether further assessment is required.
- The outcome of the Tier 3 assessment will determine whether the noise impact is acceptable, whether the noise needs to be mitigated and minimized or whether the noise is unacceptable.
- The Tier 3 assessment takes account of existing background sound levels in the area and noise levels due to rainfall.
- The attended collection of night-time BGN levels at NSRs, or groups of such NSRs, within at 500 m of the centreline of the OHL during suitable dry weather conditions, before construction.
- Allowance for the effects of rainfall on BGN.
- Prediction of contribution from conductors.
- Determination of total excess at the most likely rain rate.

13.7 Summary

13.7.1 This chapter outlines the tasks to be undertaken during the EIA with regards to Noise and Vibration. Any potential impacts likely to have a significant effect on the NSRs, with respect to operational noise and construction noise of the Proposed Development, will be evaluated within the EIA Report.

13.7.2 The noise and vibration chapter of the EIAR will consider the following potential impacts:

- noise and vibration during the construction phase; and
- operational effects of noise from the OHL.

13.7.3 The assessment will initially consider noise sensitive receptors that are within 500 m of the proposed overhead line alignment. An initial assessment of desktop calculations will be performed to determine the source noise of the proposed conductor type, this calculation will determine the distances that noise sensitive receptors have the potential for impact. Any properties that fall within impact zones will undergo baseline noise surveys.

13.7.4 Construction noise will be assessed to BS5228 standard.

13.7.5 Operational noise will be assessed to BS4142 standard with guidance from TGN(E)322.

13.7.6 There are no known vibrational noise issues associated with the operation of the Proposed Development at nearby NSRs. Therefore, it is proposed that vibration from operation is proposed to be scoped out of the EIA assessment.

14. FORESTRY

14.1 Introduction

14.1.1 This chapter provides a brief overview of the forestry baseline conditions, the potential effects associated with construction and operation of the Proposed Development and the proposed scope of assessment methodology to be considered in the EIA Report.

14.2 Baseline

14.2.1 The Proposed Development, running north to south from Spittal in Caithness to Beauly in Inverness-shire, passes through the Planning Authority of THC.

14.2.2 Within the Highland region, the Proposed Route passes through significant areas of both broadleaved and coniferous commercial forestry plantations, with the largest extents of commercial woodland occurring across the public forest estate and large private estates. Commercial plantations account for approximately 67% of potentially impacted woodland along the operational corridor.

14.2.3 Across the rout options, several areas of woodland are classed as Long-Established Woodland of Plantation Origin and there are also small pockets of woodland classed as Ancient Woodland of Semi-natural Origin, which are listed on the Ancient Woodland Inventory (AWI).

14.2.4 Native Woodland, as defined by the Native Woodland Survey of Scotland, is present generally in small coups scattered across the route options.

14.3 Potential for Significant Environmental Effects

14.3.1 Construction of the project would require the removal of sections of commercial forest, which would be undertaken in consultation with Scottish Forestry, Forestry & Land Scotland (FLS), and other affected landowners. After felling, any timber removed that is commercially viable would be sold and the remaining forest material would be dealt with in a way that delivers the best practicable environmental outcome and is compliant with waste regulations.

14.3.2 The potential forestry effects associated with the construction and operation of the Proposed Development therefore includes:

- Temporary or Permanent woodland cover loss and fragmentation;
- Potential for wind throw risk and identification of wind firm boundaries;
- Potential for forest landscape impact and identification of forest landscape design boundaries; and
- Loss of timber volume production due to early felling.

14.3.3 An operational wayleave corridor would be required to enable the safe operation and maintenance of the overhead line. The width of this corridor would vary along the length of the OHL and will be determined by several factors including ground conditions, topography and species of tree present. The exact area to be removed would be assessed in a Forestry Impact Assessment which will be carried out as part of the environmental assessment. This will include production of mapping indicating the varying length of the operational corridor along the OHL, determined by data gathered from site survey and FCS plans, and quantification of the total area to be felled. In all instances, the width of the operational corridor, and thus degree of felling required, would be minimised. Only trees which would pose a risk to the OHL at their full height would be removed.

14.3.4 The detail of future land management areas affected will influence the residual significance. Notably, many areas through which the proposed OHL would pass have already been clear-felled, with several to be left as such to allow reinstatement to peatland.

14.3.5 The Proposed Development would result in some loss of forested area, and the construction and operation of the OHL has the potential to affect forestry operations. However, significant effects are

not considered likely at this stage as the Applicant is working closely with landowners to minimise potential operational effects by micrositing the OHL along the edge of coups or within areas which are not being restocked to prevent the isolation of commercial forest blocks.

14.4 Mitigation

14.4.1 The routeing and alignment selection process for the Proposed Development has enabled consideration of potential significant effects on forestry throughout the evolution of the project to date.

14.4.2 In line with the Scottish Government's policy on control of woodland removal[145], Compensatory Planting would be required for all areas of woodland loss associated with the Proposed Development. This would be discussed with Forestry and Land Scotland, other forestry owners and THC.

14.5 Proposed Scope of Assessment

14.5.1 A targeted Forest Impact Assessment will be completed for the Proposed Development. It is anticipated that this will include the following activities:

- Calculation and description of areas required to be cleared of woodland and areas which could be returned for replanting;
- An assessment of the effects of changes to the woodland composition and existing felling and replanting programmes; and
- Proposals for mitigation if required under the terms of the EIA Regulations.

14.5.2 The forestry assessment will focus on areas of commercial forestry through which the Proposed Development would be routed. Consideration will be undertaken on achieving resilience from tree fall e.g. Powerline tree 'Red Zone' assessment based on a pragmatic appraisal of the maximum growth height of trees. Tree growth height appraisal will consider all site and species factors. Where necessary, forestry wind throw hazard and forest landscape assessment will be considered on the impact of woodland removal areas. Where wind throw and forest landscape impact is predicted, consideration will be made as to the requirement of felling to desirable wind firm and forest landscape boundaries.

14.5.3 This assessment will be based on the requirement to form an Operational Corridor (OC), while recognising the potential impact over broader forest management from the Proposed Development. The assessment will consider the OC only and is not proposed to address overall Forest Plans. Any felling undertaken outwith the OC would be solely under the control of the landowner, and the Applicant would not have any influence or control over such. Consequently, the assessment is limited to consideration of the effects of the Proposed Development on forest composition and yield.

14.6 Methodology

14.6.1 The preparation of the Forest Impact Assessment will refer to relevant industry guidance including, but not limited to:

- Forestry Commission (2011): The UK Forestry Standard[146], The Government's Approach to Sustainable Forestry. Forestry Commission, Edinburgh;
- Scottish Government (2019) Scotland's Forestry Strategy 2019-202946. Scottish Government, Edinburgh;[147]

[145] Scottish Government, (2019). *The Scottish Government's Policy on Control of Woodland Removal.* (online) Available at: https://forestry.gov.scot/publications/285-the-scottish-government-s-policy-on-control-of-woodland-removal/viewdocument (Last accessed: 26 March 2020).

[146] Forestry Commission (2011): The UK Forestry Standard Fourth Edition [online] Available at: https://www.forestry.gov.uk/pdf/FCFC001.pdf/$FILE/FCFC001.pdf [last accessed 22 February 2019].

[147] Scottish Government. (2019). Scotland's Forestry Strategy 2020-2019. [online] Available at: https://consult.gov.scot/forestry/scotlands-forestry-strategy2019-29/ [last accessed 22 February 2019].

- Forestry Commission (2011): The UK Forestry Standard Fourth Edition [online] Available at: https://www.forestry.gov.uk/pdf/FCFC001.pdf/$FILE/FCFC001.pdf
- UKWAS (2018): The UK Woodland Assurance Standard Fourth Edition[148]. UKWAS, Edinburgh;
- Forestry Commission Scotland (2009): The Scottish Government's Policy on Control of Woodland Removal[149]. Forestry Commission Scotland, Edinburgh;
- Forestry Commission (2011): Forests and Water. UK Forestry Standard Guidelines (and other guidelines in the same series)[150] . Forestry Commission, Edinburgh;
- SEPA (2013) Guidance on the Management of Forestry Waste[151] . SEPA;
- The Highland Council (2006): Highland Forest & Woodland Strategy[152]; and
- The Highland Council (2013): Supplementary Guidance. Trees, Woodlands & Development[153]. The Highland Council, Inverness.

14.6.2 The Forest Impact Assessment will identify and quantify areas of forest which would need to be removed to accommodate the Proposed Development, those available for replanting once construction is complete and the net area of forest land lost and will assess the potential impacts of this loss on the forest resource and structure. It will also detail how forest residues will be managed in line with the waste regulations and any proposals for mitigation where a significant adverse effect is predicted under the terms of the EIA Regulations. The Forest Impact Assessment will be presented as a chapter in the EIA Report.

14.7 Issues to be Scoped Out

14.7.1 The operational corridor defines the limit for which the Applicant is seeking consent under Section 37 of the Electricity Act 1989. As such, the Forest Impact Assessment will not provide an assessment of any felling or restocking requirements outwith the operational corridor. These works are the responsibility of the landowner and will be undertaken in accordance with the requirements set out within the Forestry Act 1967.

14.7.2 Secondary effects resulting from forestry activities, including effects on habitats and species, ornithology, hydrology and landscape and visual effects, would be considered within their respective chapters of this EIA Report and would not be included within the Forestry Chapter.

148 UKWAS. (2018). *The UK Woodland Assurance Standard Fourth Edition.* [online] Available at: https://www.fsc-uk.org/download.ukwas-4th-edition- version-4-0.a-1006.pdf [last accessed 22 February 2019].

149 Forestry Commission Scotland. (2009). *The Scottish Government's Policy on Control of Woodland Removal.* [online] Available at https://www.forestry.gov.uk/PDF/fcfc125.pdf/$FILE/fcfc125.pdf [last accessed 22 February 2019].

150 Forestry Commission. (2017). *The UK Forestry Standard, The Government's Approach to Sustainable Forestry.* https://www.forestry.gov.uk/pdf/FCFC001.pdf/$FILE/FCFC001.pdf [last accessed 22 February 2019].

151 SEPA. (2013). *Guidance on the Management of Forestry Waste.* [online] Available at https://www.sepa.org.uk/media/28957/forestry_waste_guidance_note.pdf [last accessed 22 February 2019].

152 The Highland Council. (2006). *Highland Forest & Woodland Strategy* [online] https://www.highland.gov.uk/downloads/file/891/highland_forest_and_woodland_strategy [last accessed 22 February 2019].

153 The Highland Council. (2013). *Supplementary Guidance. Trees, Woodlands & Development*. [online] Available at https://www.highland.gov.uk/download/downloads/id/354/trees_woodlands_and_development_supplementary_guidance.pdf [last accessed 22 February 2019].

14.8 Summary

14.8.1 The Proposed Development would require clearing areas of existing coniferous forest plantation. A targeted Forest Impact Assessment will be carried out for the Proposed Development including calculation of areas of temporary and permanent loss.

14.8.2 Where a significant adverse effect is predicted under the terms of the EIA Regulations the Forest Impact Assessment will propose mitigation measures to address these effects.

15. RECREATION AND TOURISM

15.1 Introduction

15.1.1 This chapter provides a brief overview of the recreation and tourism baseline conditions, the potential effects associated with the Proposed Development and the proposed scope of assessment methodology to be considered in the EIA Report.

15.2 Baseline Conditions

15.2.1 The main settlements within the vicinity of the Proposed Development include Spittal, Dunbeath, Berriedale, Helmsdale, Brora, Golspie, Bonar Bridge, Ardross, Dingwall, Strathpeffer, Contin, Marybank, Muir of Ord and Beauly. The Proposed Development runs over or proximal to the A831, A834, A835, A836, A837, A839, A897, A9 and the A949, among various B-roads and single lane tracks. Other smaller settlements, rural communities and clusters of properties are present along the Proposed Development.

15.2.2 There are a number of walking and cycling routes, many of which are noted as Core Paths by The Highland Council or identified as Rights of Way and Wider Path Network paths. The Proposed Development also crosses the John O'Groats Trail which is a designated Long Distance Path[154]. The Proposed Development is in the vicinity of the following National Cycle Network (NCN) routes: Sustrans Inverness to John O'Groats and 1 from Dover to the north of Scotland[155]. For the purpose of this report, these receptors have collectively been termed recreational routes.

15.2.3 There are also a number of promoted recreational road routes within Scotland, with three being in the vicinity of the Proposed Development. The North Coast 500 is a 500 mile (805 km) long route that starts and finishes in Inverness[156].

15.2.4 Key visitor attractions and activities throughout the area include the main settlements noted above, as well as a variety of walks, other outdoor activities including, for example, fishing and stalking. There are also a number of cultural heritage and nature-based attractions. There are many lochs and waterways, including the Loch of Toftingall, River Helmsdale, River Brora, Loch Brora, River Fleet, Loch Buidhe, Kyle of Sutherland, River Glass, River Conon, River Orrin and River Beauly in the vicinity of the Proposed Development.

15.2.5 Numerous distilleries are located within the area including Clynelish, Glenmorangie, Invergordon, GlenWyvis and Singleton. Forestry and Land Scotland (FLS) open access land is also located within the area surrounding the Proposed Development. The Strathpuffer mountain bike event is held in the Torrachility Forest west of Strathpeffer.

15.2.6 Tourist accommodation is located in the vicinity of the Proposed Development and is, generally, centred around the main settlements but also located outwith these areas.

15.3 Potential Impacts

Recreation

15.3.1 The following aspects have been considered for the recreation assessment:

- The Proposed Development would require temporary and permanent land-take during construction and operation. This temporary and permanent land-take could lead to a complete or partial loss of a recreational asset and/or land associated with the recreational asset. For recreational routes, access may be temporarily restricted in order to accommodate construction of the Proposed Development, which could lead to some recreational routes being temporarily

[154] Long Distance Walkers Association (2023) Long Distance Paths . Available at: https://ldwa.org.uk/ldp/members/search_by_path.php
[155] Sustrans (2023). The National Cycle Network . Available at: https://www.sustrans.org.uk/national-cycle-network
[156] VisitScotland (2023). Scotland's Road Trips. Available at: https://www.visitscotland.com/travel-planning/getting-around/driving/route-planner/overview

diverted. In addition, some recreational routes may need to be permanently diverted. Proposed temporary and permanent recreational route diversions will be presented in the EIA Report. The Proposed Development could also have an adverse effect on amenity experienced by recreational users, of both recreational assets and recreational routes, during the construction and operational phases of the Proposed Development.

- There is also the potential for temporary adverse effects on access to recreational assets during the construction of the Proposed Development, as a result of increased traffic movements on the local road network as well as vehicular, pedestrian and cyclist diversions that could be implemented.
- During operation, land associated with recreational assets and/or recreational routes may be restricted around the towers or access roads for maintenance activities. However, this would be for a small area around the infrastructure and for a limited time and is not anticipated to lead to significant effects.
- During operation, there would be minimal traffic movements on the local road network as a result of maintenance activities. It is unlikely there would be vehicular, pedestrian and cyclist diversions associated with the maintenance activities. Therefore, significant effects are not anticipated.

Tourism

15.3.2 The following aspects have been considered for the tourism assessment:

- There is the potential for adverse effects on tourism during the construction and operation of the Proposed Development. The construction and operation of the Proposed Development could affect availability, accessibility and amenity of tourist attractions, including recreational assets and routes. Changes in availability would be due to a loss or partial loss of a resource.
- The construction of the Proposed Development could also affect the availability of tourist accommodation due to the influx of construction workers.
- The operation of the Proposed Development could also have an adverse effect on the tourism economy, however, due to the nature of the Proposed Development these effects are not anticipated to be significant. These effects will be highlighted within a separate socio-economic report that will accompany the Application.

15.4 Mitigation

15.4.1 An Outline CEMP will be prepared as part of the Application. The CEMP will provide a framework from which a detailed CEMP will be developed by the appointed Principal Contractor.

15.4.2 The CEMP would include the need for public notices to be issued before the construction works commence to inform recreational users of dates and durations of the works.

15.4.3 An Outdoor Access Plan will also be included within the CEMP and will demonstrate how continued access for recreational users along Core Paths, and other recreational routes in the area will be managed in a way that least affects their recreational users.

15.4.4 A Worker Accommodation Strategy will also be developed as part of the Application. The Construction Accommodation Strategy will set out the approach that will be taken to accommodating construction workers along the length of the Proposed Development.

15.4.5 The recreation and tourism assessment considers other environmental topics including landscape and visual amenity, noise as well as traffic and transport. Therefore, the mitigation measures outlined in those chapters are also relevant for recreation and tourism.

15.4.6 The mitigation measures for recreation and tourism will be progressed and refined as part of the EIA.

15.5 Proposed Scope and Assessment Methodology

15.5.1 The recreation and tourism assessment will establish potential significant effects of the Proposed Development on recreation and tourism. There is no established guidance for conducting a recreation and tourism assessment as part of the EIA process. The assessment methodology will be based upon professional judgement and drawn on DMRB LA 112 Population and Human Health[157].

Study Area

15.5.2 There are no recognised standards or methodologies for assessing impacts of OHLs on recreation and tourism effects . Therefore, the study areas have been defined based on professional judgement and using guidance available for other types of development i.e. DMRB LA 112 Population and Human Health. The study area for the assessment of recreation and tourist assets will be 5 km from the Proposed Alignment LOD and associated access tracks. The study area will be extended beyond 5 km at specific locations if deemed appropriate. For the assessment on tourist accommodation, the study area will be 5 km from the Proposed Alignment LOD and associated access tracks as well as settlements where construction workers are likely to reside.

Recreation

15.5.3 The EIA Report will include a qualitative assessment of the effect of the Proposed Development on recreational assets and land associated with recreational assets within the study area. The assessment will consider changes in availability, accessibility and amenity on these receptors. Changes in availability would be due to a loss or partial loss of a recreational asset and/or land associated with an asset. For the purposes of the assessment, the loss of a recreational asset and/or land associated with a recreational asset will be considered as a permanent, long-term construction effect within the EIA. Amenity is considered to be a combination of visual amenity, air quality and noise levels experienced by recreational users.

15.5.4 It is anticipated that the construction of the Proposed Development would lead to temporary and potentially permanent diversions of recreational routes. For the purposes of the assessment, any permanent diversion of recreational routes will be considered as a permanent, long term construction effect within the EIA. The assessment will consider changes to access, severance and diversion lengths for recreational routes during the construction phase of the Proposed Development. Loss of amenity for recreational routes will also be considered for both the construction and operational phases of the Proposed Development. As detailed above, amenity is considered to be a combination of visual amenity, air quality and noise levels experienced by recreational users.

15.5.5 The assessment will be informed by the landscape and visual, noise and traffic and transport assessments that will be undertaken for the Proposed Development.

Tourism

15.5.6 Key tourist attractions and activities (including recreational assets and routes) within the study area will be identified using publicly available sources. A qualitative assessment will be undertaken based on changes in availability, accessibility and amenity to tourist attractions/activities during the construction and operation of the Proposed Development. Changes in availability would be due to a loss or partial loss of a resource. For the purpose of this assessment, amenity is considered to be a combination of visual amenity, air quality and noise levels experienced by users of tourist attractions and activities. The assessment will be informed by the landscape and visual, noise and traffic and transport assessments that will be undertaken for the Proposed Development.

15.5.7 The construction of the Proposed Development could also affect the availability of tourist accommodation due to the influx of construction workers. A qualitative assessment will be undertaken considering the anticipated number of construction workers and where the construction workers are

[157] Highways England (now known as National Highways), Transport Scotland, Welsh Government and Department for Infrastructure (2020). Population and Human Health. Available at: https://www.standardsforhighways.co.uk/tses/attachments/1e13d6ac-755e-4d60-9735-f976bf64580a?inline=true

likely to reside. Tourist accommodation within the study area will be identified using publicly available sources.

Assessment Methodology

15.5.8 The assessment of significance will be based on the environmental value/sensitivity of a recreational receptor and the magnitude of change from baseline conditions.

15.5.9 Recreational and tourist receptors will be assigned a value and/or sensitivity using the criteria set out in **Table 15.1** as a basis. The criteria have drawn on DMRB LA 112 Population and Human Health and have been adapted for the recreation and tourism assessment. Each receptor's value will be assigned taking account of professional judgement and past experience of similar schemes.

Table 15.1: Recreation and Tourism Sensitivity Criteria

Sensitivity	Criteria
High	• Recreational and tourist assets and land associated with assets that are of national or international status and/or have high visitor numbers; • Tourist accommodation where no alternative in the local area is available; and • Recreational routes frequently used by walkers and cyclists for recreational and leisure purposes (e.g. national trails).
Medium	• Recreational and tourist assets and land associated with assets that are of regional status and/or have medium visitor numbers; • Tourist accommodation where limited alternatives are available in the local area; and • Recreational routes moderately used by walkers and cyclists for recreational and leisure purposes (e.g. regional trails).
Low	• Recreational and tourist assets and land associated with assets that are of local status and/or low visitor numbers; • Tourist accommodation where alternatives are available in the local area; and • Locally designated recreational routes for which alternative routes can be taken.
Negligible	• Recreational and tourist assets and land associated with assets that have very low visitor numbers; • Tourist accommodation where numerous alternatives are available in the local area; and • Recreational routes not/infrequently used by walkers and cyclists for recreational purposes.

15.5.10 The magnitude of change shall be reported in line with the criteria outlined in **Table 15.2** below. The criteria have drawn on DMRB LA 112 Population and Human Health. Each receptor's value will be assigned taking account of professional judgement and past experience of similar schemes. For tourist accommodation, the magnitude of change will be determined on a case-by-case basis taking into account the surrounding local context and anticipated duration of the impact. If the percentage of tourist accommodation that will become unavailable is not known, professional judgement will be used to determine the magnitude of impact.

Table 15.2: Recreation and Tourism Magnitude of Impact Criteria

Sensitivity	Criteria
Major	Recreation and tourism: • Loss of asset and/or quality and integrity of asset; severe damage to key characteristics, features or elements, e.g. direct acquisition and demolition of buildings and direct development of land to accommodate the Proposed Development. • Loss of use of 100% of tourist accommodation premise (due to leasing of tourist accommodation being required for construction workers).

Sensitivity	Criteria
	Recreational routes: • Permanent loss/severance of an existing recreational route used by walkers and cyclists.
Moderate	Recreation and tourism: • Partial loss of/damage to key characteristics, features or elements, e.g. partial removal or substantial amendment to access or acquisition of land compromising viability of recreation asset. • Loss of use of 50% of tourist accommodation premise (due to leasing of tourist accommodation being required for construction workers). Recreational routes: • Disruption of a recreational route used by walkers and cyclists with large increase/decrease in journey length/time and/or large changes to amenity for recreational users
Minor	Recreation and tourism: • A discernible change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements, e.g. amendment to access or acquisition of land resulting in changes to operating conditions that do not compromise overall viability of recreation asset. • Loss of use of 25% of tourist accommodation premise (due to leasing of tourist accommodation being required for construction workers). Recreational routes: • Alteration of a recreational route used by walkers and cyclists but with minor increase in journey length/time and/or minor changes to amenity for recreational user.
Negligible	Recreation and tourism: • Very minor loss or detrimental alteration to one or more characteristics, features or elements, e.g. acquisition of non-operational land or buildings not directly affecting the viability of recreation asset. • Loss of use of less than 10% of tourist accommodation premise (due to leasing of tourist accommodation being required for construction workers). Recreational routes: • Very minor change to recreational route used by walkers and cyclists.

15.5.11 The overall significance of effects will be determined based on the matrix shown in **Table 15.3**. Effects that are classified as moderate or above are considered to be significant and are highlighted in bold. Effects classified as minor or below are considered to be not significant.

Table 15.3: Recreation and Tourism Matrix of Significance

		Magnitude of Impact			
		Major	Moderate	Minor	Negligible
Resource value and/or sensitivity	High	**Major**	**Major or Moderate**	**Moderate** or Minor	Minor
	Medium	**Major or Moderate**	**Moderate**	Minor	Minor or Neutral
	Low	**Moderate** or Minor	Minor	Minor or Neutral	Minor or Neutral
	Negligible	Minor	Minor or Neutral	Minor or Neutral	Neutral

15.6 Issues to be Scoped Out

15.6.1 The following aspects have been scoped out of the recreation assessment:

- During operation, land associated with recreational assets and/or recreational routes may be restricted around the towers or access roads for maintenance activities. However, this would be

for a small area around the infrastructure and for a limited time and is not anticipated to lead to significant effects.

- During operation, there would be minimal traffic movements on the local road network as a result of maintenance activities. It is unlikely there would be vehicular, pedestrian and cyclist diversions associated with the maintenance activities. Therefore, significant effects are not anticipated.

15.6.2 The operation of the Proposed Development could also have an adverse effect on the tourism economy, however, due to the nature of the Proposed Development these effects are not anticipated to be significant. These effects will be highlighted within a separate socio-economic report that will accompany the Application.

16. OTHER ISSUES SCOPED OUT OF EIA

16.1 Introduction

16.1.1 This chapter provides the rationale for excluding certain effects on specified environmental topics from the EIA. The following topics are proposed to be scoped out:

- Land Use;
- Air Quality;
- Climate Change (Life cycle/embodied Carbon);
- Material Assets and Waste;
- Major Accidents and Disasters;
- Electric and Magnetic Fields;
- Radio and TV Interference;
- Population and Human Health; and
- Socio Economics.

16.2 Land Use

Baseline Conditions

16.2.1 Land use across the Proposed Development includes forestry/woodland and agriculture, with some areas of moorland, scattered properties (residential and commercial), hamlets, roads, railway and wind farms. The project does not interface with any areas allocated for future development as listed in the Local Development Plans for THC.

16.2.2 Impacts on forestry are discussed in **Chapter 14: Forestry** and are not discussed further here.

Potential Effects

16.2.3 Potentially significant effects which can arise on land use from developments of this type include temporary or permanent loss of utilised land, including agricultural land; temporary or permanent severance and impact on the viability of existing activities; and impacts on land designated for future development.

16.2.4 Land use impacts associated with the Proposed Development are anticipated to be limited. The construction work may result in some temporary loss of land or access restriction. However, it is considered that this can be adequately managed through the use of a Construction Access Management Plan.

16.2.5 The permanent loss of land to tower locations and new access tracks would be managed through agreements with the relevant landowners and farmers and is not considered to result in a likely significant effect on land use during the operational lifetime of the Proposed Development.

16.2.6 Dialogue would be maintained by the Applicant and the Principal Contractor with landowners, local tenants and property owners throughout the construction period to ensure any potential disruption as a result of the proposed works is kept to a minimum.

Issues Scoped Out

16.2.7 Regarding land use specifically, no likely significant effects are predicted as a result of the Proposed Development and therefore an assessment on land use (with the exception of forestry) is proposed to be scoped out of the EIA Report in its entirety.

16.3 Air Quality

Baseline Conditions

16.3.1 Local air quality is a combination of background air quality, representative of general levels of pollution away from busy roads and industrial activity and added emissions from local emission sources such as road traffic. Due to the generally rural nature of the Proposed Development and sensitive receptors, contribution from road traffic and polluting industrial sources are minimal. The Proposed Route does not pass through any Air Quality Management Areas (AQMAs).

Potential Effects

16.3.2 Impacts can arise on air quality from developments of this type due primarily to generation and dispersal of dust and airborne particulate matter and emissions from plant, construction traffic and construction activities. However, as construction works would be temporary and short term at any specific location, and given the relatively small amount of emissions generating plant or vehicles required, the effects would be localised, short term and intermittent, and not considered to be significant. Potential effects would further be minimised through the implementation of mitigation measures, in particular the project CEMP and relevant GEMPs.

Issues Scoped Out

16.3.3 No significant effects are predicted as a result of the Proposed Development and therefore an assessment on air quality is proposed to be scoped out of the EIA Report in its entirety.

16.4 Climate Change

16.4.1 Climate change has been considered both in terms of life cycle/embodied carbon and land use change carbon.

Life cycle/embodied Carbon

16.4.2 Carbon in materials and components for OHLs is acknowledged in NPF4 as requiring consideration for adverse climate effects. However, the carbon quantum embedded into materials and components associated with the infrastructure is not predicted to be significant in relation to the carbon saving, because of the carbon reduction targets the Proposed Development would facilitate at a national level. The priority is therefore to ensure that the carbon embodied in the Proposed Development would be minimised as far as possible (as NPF4 Policy 2a requires) through commitments in relation to activities such as re-use, recycling of materials, circular economy principles, supply chain procurement requirements in contracts and adoption of low carbon construction methodologies. This will also support demonstration of compliance with the principles of NPF4 Policy 12 (Zero Waste).

16.4.3 It is proposed that an assessment of life cycle/embodied carbon is scoped out of the EIA Report as it has been demonstrated through the integrated impact assessment produced for NPF4 that "*the lifecycle greenhouse gas emissions assessment concludes this development will likely have an overall net positive impact on achieving national greenhouse gas emissions reduction targets*"[158]. This is because of the role that renewable energy, and the necessary transmission infrastructure, provides in meeting the national greenhouse gas emission reduction targets.

16.4.4 No likely significant adverse effects are predicted as a result of the Proposed Development and therefore an assessment on life cycle/embodied carbon is proposed to be scoped out of the EIA Report in its entirety.

Land Use Change Carbon

16.4.5 Impacts from loss or damage to peatlands and/or from loss of woodlands are also acknowledged in NPF4 climate change assessment as having some potential for adverse climate effects, although

[158] National Planning Framework 4 Research Project: Lifecycle Greenhouse Gas Emissions of NPF4 Proposed National Developments Assessment Findings (www.gov.scot)

these were typically evaluated at the strategic level as being likely to be 'negligible'. While it is acknowledged that NPF4 Policy 5d(iii) indicates a requirement for an assessment of net climate effects, it also acknowledges the process that should be followed to avoid and reduce effects on peatland and woodland through design and by following the mitigation hierarchy.

16.4.6 In the context of EIA therefore, mitigation should be considered in determining whether the effects of OHLs on peatlands would be significant. These will include demonstration of the process to avoid peat through design and siting/alignment and (as the NatureScot peatland guidance[159] identifies) securing the production of relevant plans such as CEMPs, Habitat Management Plans and Peat Management Plans. Further compensatory measures such as woodland planting and/or peatland restoration also provide opportunities to create carbon sequestering habitats, and these will be considered within the relevant technical chapters on forestry, water and geology and soils where relevant.

16.4.7 Although the design process has sought to avoid peatland wherever possible, there are some areas within the Proposed Route where there are nationally important carbon-rich soils, deep peat or priority peatland habitat. Due to the extent of carbon rich soils identified within the Proposed Development, it is proposed that a peatland specific carbon assessment would be undertaken in line with national standards and based on total life cycle perspectives of the Proposed Development[160]. The objective will be to both quantify the magnitude of effect and support appropriate measure to mitigate impacts and effects on peatlands[161]. Further information is presented in **Chapter 10: Geological Environment**.

16.5 Material Assets and Waste

Potential Effects

16.5.1 The Proposed Development would require material consumption for the conductors, insulators, other fittings, steel and foundation works, and access track construction. General construction waste from the compounds and sub-yards would be recycled where possible.

16.5.2 Considering the nature of the Proposed Development, material use and waste generation will be limited in type and quantity, and significant effects are not anticipated. The use of recycled materials where it is feasible to do so and minimisation of waste will be advocated and this will be included in the CEMP which would be produced and implemented by the Principal Contractor.

Issues Scoped Out

16.5.3 No significant effects are predicted as a result of the Proposed Development and therefore an assessment on material assets and waste is proposed to be scoped out of the EIA Report in its entirety.

16.6 Major Accidents and Disasters

Potential Effects

16.6.1 The potential for the risk of a major accident and disaster affecting the vulnerability of the OHL is likely to be limited to those associated with unplanned power outages, due to extreme weather or structural damage. Crisis management and continuity plans are in place across the SSE Group. These are tested regularly and are designed for the management of, and recovery from, significant energy infrastructure failure events.

159 https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management
160 Appendix 2: Calculating Potential Carbon Losses & Savings from Wind Farms on Scottish Peat lands: a total life cycle perspective - Calculating carbon savings from wind farms on Scottish peat lands: a new approach - gov.scot (www.gov.scot)
161 https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management

Issues Scoped Out

16.6.2 No significant effects are predicted in relation to the vulnerability of the Proposed Development to major accidents and disasters, taking account of the existing SSE Group crisis management and continuity plans and therefore an assessment on this topic is proposed to be scoped out of the EIA Report in its entirety.

16.7 Electric and Magnetic Fields

Baseline Conditions

16.7.1 EMF arise from electric charges. Transmission lines comply with the government policy of adopting the guidelines of the International Commission on Non-Ionising Radiation Protection (ICNIRP) on exposure to EMF. The Applicant ensures at all times that they comply with relevant legislation[162], which in turn is based on the advice of the UK Government's independent scientific advisers the National Radiological Protection Board (NRPB, now part of the Health Protection Agency), to ensure the appropriate level of protection for the public from these fields. The NRPB keeps under the results of EMF health studies under constant review to ensure that the guidelines for limiting exposure are based on the best available scientific information. See **Appendix B: Justification for Scoping Out EMF Assessments for Proposed 400 kV Overhead Lines** for more detail.

Potential Effects

16.7.2 As EMF limits will be adhered to there is no potential for significant effects. An EMF compliance report will be produced by the Applicant to accompany the application for consent.

Issues Scoped Out

16.7.3 No likely significant effects are predicted as a result of the Proposed Development and therefore an assessment on EMF is proposed to be scoped out of the EIAR in its entirety.

16.8 Radio and TV interference

Baseline Conditions

16.8.1 At sufficiently high voltages and in particularly adverse weather, radio interference may occur due to corona, a phenomenon which causes the air surrounding conductors to become ionized, resulting in the conductors partially discharging. This only affects longwave (LW) and medium wave (MW) signals, which carry Amplitude Modulation (AM) radio.

16.8.2 Corona discharge is usually an intermittent phenomenon and is associated with either a faulty electrical connection or a faulty component. It is rarely found on steel-structure lines, as hardware tends to remain tightly fastened. It is not considered a source of long-term annoyance as the equipment is built and maintained to high standards and any such discharge would be the subject of remedial action.

16.8.3 LW and MW interference is very common and can occur for a wide variety of reasons including weather due to differences in atmosphere, electric motors within common household appliances, light-emitting diode (LED) lights, street lighting and passing traffic. Under certain weather conditions, there are likely to be cases of limited AM radio interference at properties in close proximity to the OHL.

16.8.4 The Radio and Television Investigation Service (RTIS) in the regulatory body The Office of Communications (Ofcom) undertake investigations into complaints of radio and television interference of all kinds and from all sources. Published information, indicates few cases of interference attributable to OHLs of 100 kV and over, and the number of complaints has fallen over recent years.

[162] Energy Networks Association. What are electromagnetic fields? Available at: http://www.energynetworks.org/electricity/she/emfs.html

Potential Effects

16.8.5 The most likely impacts caused by the Proposed Development would be upon LW and MW signals which carry AM radio. AM is the oldest radio broadcasting system and over the years the number of radio stations broadcasting on AM is reducing, as they move to more reliable, higher-quality FM or digital platforms and there are now only a limited number of radio stations still operating on AM. The Proposed Development is not considered to cause interference to Television (TV), Frequency Modulation (FM) or Digital Audio Broadcasting (DAB) signals.

16.8.6 Interference to AM signals is already very common from a variety of sources and it is considered that the Proposed Development would not cause a significant effect to AM interference. Any complaints by nearby residents raised to Ofcom or RTIS and found to be attributable to the Proposed Development would be appropriately dealt with by the Applicant on a case-by-case basis. It is proposed to scope out further assessment of radio and TV interference.

Issues Scoped Out

16.8.7 No significant effects are predicted as a result of the Proposed Development and therefore an assessment on Radio and TV interference is proposed to be scoped out of the EIA Report in its entirety.

16.9 Population and Human Health

Baseline Conditions

16.9.1 The Proposed Route predominantly passes through a rural to semi-rural landscape including some hamlets and scattered residential properties.

Potential Effects

16.9.2 The impacts on population and human health for a development of this nature and scale are limited and comprise a composite of the effects of other topics such as noise, air quality, hydrology (private water supplies), recreation and EMFs, which are considered separately within this report.

16.9.3 Socio-economic factors will be considered in a separate Socio-economic report which will accompany the application.

Issues Scoped Out

16.9.4 The topics which collectively comprise the topic of Population and Human Health are dealt with separately and therefore a standalone assessment of Population and Human Health has been scoped out. However, the cumulative impact of effects from different topics on a common receptor, in this instance local residents, will be considered within the EIA Report under the cumulative effects section.

16.10 Socio-economics

Issues Scoped Out

16.10.1 It is proposed that a Socio-economic Assessment is scoped out of the EIA Report as the project is expected to provide substantive support to the economy of Scotland in terms of direct and indirect employment and business investment, with wider economic benefits, including the facilitation that the project provides to large scale deployment of renewable generation in the North of Scotland. This is supported by its status as a National Development 3 (ND3) "*Strategic Renewable Electricity Generation and Transmission Infrastructure*" in NPF4.

16.10.2 The NPF4 adds that: "*Their designation means that the principle for development does not need to be agreed in later consenting processes, providing more certainty for communities, businesses and investors*". It is on this basis that the Applicant is scoping out socio-economic assessment from the

EIA as the Proposed Development falls within the ambit of development supported by established national policy.

16.10.3 A stand-alone report will be provided to accompany the EIA Report as part of the application to provide information on this topic to be considered in relation to wider policy, as part of the determination process.

17. NEXT STEPS

17.1 Inviting Comments

17.1.1 SSEN Transmission suggests that the Scottish Ministers invite consultees to comment on the following:

- What environmental information do you hold or are aware of that will assist in the EIA described here?
- Do you agree with the proposed approach for baseline collection, prediction and significance assessment?
- Are there any key issues or possible effects which have been omitted?
- Do you agree with the list of issues to be scoped out, and the rationale behind the decision?
- Of those issues identified for assessment, which do you consider the most important/material and which the least?

17.1.2 Responses should be directed to:

Email: Econsents_Admin@gov.scot

OR

Energy Consents Unit

Scottish Government

4th Floor

5 Atlantic Quay

150 Broomielaw

Glasgow

G2 8LU

17.1.3 When submitting a response to the Scoping Report, the Applicant would be grateful if you could also send a copy of your response to the address below:

Email: Tara.Cowley@sse.com.

17.1.4 The Scoping Opinion provided will be used to finalise the terms of the EIA and the specific approach to the individual assessments.

17.1.5 All comments received will be included in the EIA Report for reference, unless consultees request otherwise.