



Troston Overhead Line Grid Connection

Environmental Appraisal

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Abbreviations

AADT	Annual Average Daily Traffic
ATC	Automatic Traffic Counter
BAP	Biodiversity Action Plan
BNG	Biodiversity Net Gain
BGS	British Geological Survey
BTO	British Trust for Ornithology
CEMP	Construction Environmental Management Plan
CIA	Chartered Institute for Archaeologists
CTMP	Construction Traffic Management Plan
CWR	Control of Woodland Removal
CLVIA	Cumulative Landscape and Visual Impact Assessment
DfT	Department for Transport
DPSG	Designation Policy and Selection Guidance
DAMS	Detailed Aspect Method of Scoring
DBH	Diameter at Breast Height
ECU	Energy Consents Unit
EIA	Environmental Impact Assessment
ENA	Energy Networks Association
GLVIA3	Guidelines for Landscape and Visual Impact Assessment 3
GWDTE	Groundwater Dependent Terrestrial Ecosystems
HGV	Heavy Goods Vehicle
HEPS	Historic Environment Policy for Scotland
HER	Historic Environment Record
HES	Historic Environment Scotland
IEMA	Institute of Environmental Management and Assessment

ISA	Inside Study Area
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
kV	Kilowatt
LBAP	Local Biodiversity Action Plan
LCT	Landscape Character Type
LDP	Local Development Plans
LGV	Light Goods Vehicle
LMP	Long-term Management Plan
LoD	Limit of Deviation
LVA	Landscape and Visual Appraisal
LVIA	Landscape and Visual Impact Assessment
MCHE	Managing Change in the Historic Environment
NCAP	National Collection of Aerial Photography
NESA	National Evaluation from Surveys and Assignment
NFI	National Forest Inventory
NGR	National Grid Reference
NPF	National Planning Framework
NGET	National Grid Electricity Transmission
NRHE	National Record of the Historic Environment
NRTF	National Road Traffic Forecast
NVC	National Vegetation Classification
NPV	Net Present Value
NSR	Non-Statutory Register
OHL	Overhead Line
OS	Ordnance Survey
OSA	Outer Study Area

PA	Planning Authority
PAC	Pre-application Consultation
PAN	Planning Advice Note
PIA	Personal Injury Accident
POC	Point of Connection
PRF	Potential Roost Feature
PSRA	Peat Slide Risk Assessment
PWS	Private Water Supply
RSA	Regional Scenic Area
RSPB	Royal Society for the Protection of Birds
RVAA	Residential Visual Amenity Assessment
SAC	Special Areas of Conservation
SBL	Scottish Biodiversity List
SEPA	Scottish Environment Protection Agency
SF	Scottish Forestry
SFS	Scottish Forestry Strategy
SLUS	Scottish Land Use Strategy
SNH	Scottish National Heritage
SPA	Special Protection Area
SPEN	SP Energy Networks
SPP	Scottish Planning Policy
SSSI	Site of Special Scientific Interest
SUW	Southern Upland Way
SWMP	Site Waste Management Plan
TAG	Transport Assessment Guidance
UKFS	UK Forestry Standard
UNESCO	United Nations Educational, Scientific and Cultural Organization

WTW	Water Treatment Works
WHC	Wind Hazard Class
YC	Yield Class
ZTV	Zone of Theoretical Visibility

01.

Introduction

1 Introduction

1.1 Background and Need for the Proposed Development

- 1.1.1 SP Energy Networks (SPEN) has been contracted by National Grid Electricity Transmission (NGET) to connect the consented Troston Loch Wind Farm to the national grid. The Troston Loch Wind Farm was approved by the Energy Consents Unit (ECU) in December 2020 (reference ECU00001785¹) for Section 36 consent under the Electricity Act 1989.
- 1.1.2 SPEN proposes to achieve this objective by providing a grid connection between the planned Troston Loch substation and the consented Glenshimmeroch collector substation, which will be connected to the grid. The Troston Loch Wind Farm's point of connection (POC) will be located at NGR E267516, N588834 and the consented Glenshimmeroch collector substation (reference 22/1079/FUL) will be located at NGR E264779, N587363. Figure 1.1 shows the location of the proposed grid connection in the context of the consented wind farms. These renewable energy developments are located between the towns of St John's Town of Dalry and Moniaive in Dumfries and Galloway.
- 1.1.3 SPEN has identified that the planned grid connection will require a 132 kV overhead line (OHL) connection with a small section of underground cable to connect the OHL to the Glenshimmeroch collector substation. It is anticipated that the Troston Loch grid connection will be required to be constructed and ready for connection by October 2027.

1.2 The Applicant

- 1.2.1 SPEN owns and operates the network of cables, OHLs and substations transporting electricity to customers in central and southern Scotland. SPEN is a regulated business with the following responsibilities under the Electricity Act 1989:
- to develop and maintain an efficient, coordinated and economical system of electricity transmission;
 - to facilitate competition in the generation and supply of electricity; and
 - to offer non-discriminatory terms for connection to the transmission system, for both new generation and new sources of electricity demand.
- 1.2.2 SPEN is committed to minimising the potential impacts of the proposed Troston OHL grid connection both on the receiving environment and the people who live, work and enjoy outdoor recreation within or near the study area. Best practice



¹<https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00001785>

requires environmental impacts to be managed as proactively as possible, and SPEN is committed to doing so through design as far as practicable.

1.3 Scope of the Environmental Appraisal

- 1.3.1 An environmental appraisal has been undertaken to provide environmental information to support the application for consent under Section 37 of the Electricity Act 1989 (as amended), and deemed consent under Section 57(2) of the Town and Country Planning (Scotland) Act 1997, as amended, for the OHL section of the proposed development. The underground cable is considered to be ancillary development to that proposed in the application for consent under Section 37 of the Electricity Act 1989.
- 1.3.2 In addition, environmental information is also provided in order to meet the applicant's obligations to preserve amenity and mitigate environmental effects under Schedule 9 of the Electricity Act 1989.
- 1.3.3 The scope of this environmental appraisal includes:
- Landscape and visual
 - Ecology and ornithology
 - Archaeology and cultural heritage
 - Geology, peat, hydrology and hydrogeology
 - Forestry
 - Traffic and transportation

1.4 Structure of this Report

- 1.4.1 The environmental appraisal is provided in three parts:
- Volume 1: Main Text
 - Volume 2: Figures
 - Volume 3: Technical Appendices
- 1.4.2 Volume 1 comprises 11 chapters, which are structured in the following manner:
- Chapter 1 Introduction – introduces the proposed development and the environmental appraisal.
 - Chapter 2 Planning Policy and Consents Framework – provides a summary of the planning policy and consents context.
 - Chapter 3 Route Selection – provides a summary of the routeing study carried out to determine the proposed route for the OHL.
 - Chapter 4 Proposed Development - provides a detailed description of the key design components and characteristics of the proposed development and associated land take; and outlines the planned timescales for construction and implementation.

- Chapter 5 Consultation – provides a summary of the consultation process.
- Chapters 6 to 11 Technical Assessments – reports the findings of the environmental assessments.

02.

**Planning
Policy and
Consents
Framework**

2 Planning Policy and Consents Framework

2.1 Overarching Legislation

2.1.1 The overarching legislation applicable to the planned Troston overhead line (OHL) grid connection is the Electricity Act 1989. Scottish Power Transmission's licensed businesses are authorised to transmit and distribute electricity within its network areas under the Electricity Act 1989. As such, SPEN has a statutory obligation to carry out the duties outlined within the Electricity Act 1989.

2.1.2 As a transmission licence holder for southern Scotland, SPEN is required under Section 9(2) of the Electricity Act 1989 to:

- Develop and maintain an efficient, co-ordinated and economical system of electricity transmission; and
- Facilitate competition in the supply and generation of electricity.

2.1.3 Under Schedule 9 of the Electricity Act 1989, SPEN has a duty to ensure that all its developments: *"have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiological features or special interest of protected sites, buildings, objects of architectural, historical or archaeological interest; and to do what it reasonably can to mitigate any effects which the proposals would have on the natural beauty of the countryside or any such flora, fauna, features, sites, buildings or objects."*

2.1.4 SPEN recognises that its installations, whether overhead or underground, can have an effect on the environment, and seeks to minimise this through careful routing and execution of its projects.

2.2 Consenting Requirements

Electricity Act 1989 (as amended)

2.2.1 Section 37 of the Electricity Act 1989 requires that, except for certain specific examples, all electricity lines exceeding 20 kV will require consent to be granted by the Scottish Ministers. This 'Section 37 consent' gives approval to install, and keep installed, an overhead electricity line. As the proposed OHL route will be a 132 kV OHL, consent will be required under Section 37 of the Electricity Act 1989.

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended)

2.2.2 The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 require that, before consent is granted for certain developments, an Environmental Impact Assessment (EIA) must be undertaken. The EIA Regulations set out the types of development that are always subject to an EIA (Schedule 1

developments) and other developments which may require an EIA if they exceed certain thresholds and are likely to give rise to significant environmental effects (Schedule 2 developments). The proposed OHL route currently falls under Schedule 2:

“(2) an electric line installed above ground -

(c) the purpose of which installation is to connect the electric line to a generating station the construction or operation of which requires consent under Section 36 of the Electricity Act 1989.”

- 2.2.3 SPEN submitted an EIA screening request to the Scottish Ministers in January 2023. A screening opinion was received in June 2023 (reference ECU00004716)² confirming that an EIA is not required for the proposed development. In this context, an environmental appraisal has been undertaken to support the Section 37 application instead.

Town and Country Planning (Scotland) Act 1997 and The Planning etc. (Scotland) Act 2006

- 2.2.4 Section 57 of the Town & Country Planning (Scotland) Act 1997 as amended by The Planning etc. (Scotland) Act 2006 provides that *“Planning permission may also be deemed to be granted in the case of development with government authorisation”*. In certain circumstances, deemed planning permission may include works that are ‘ancillary’ or necessary to the operation of the OHL such as cable sealing end compounds.
- 2.2.5 Some forms of development, including underground cables, are typically classed as ‘permitted development’ under the Town and Country Planning (General Permitted Development) (Scotland) Order 1992 (as amended). Developments classified as permitted development may automatically be granted planning permission, by statutory order, and do not require submission of a planning application to the Planning Authority.

2.3 Planning Policy Considerations

- 2.3.1 The proposed Troston OHL development would contribute to energy infrastructure, without which new renewable energy generation projects would be unable to contribute towards achieving these targets.
- 2.3.2 Sections 25 and 37 (2) of the Town and Country Planning (Scotland) Act 1997 (as amended by the Planning etc. (Scotland) Act 2006) require that planning decisions are made in accordance with the development plan, unless material considerations indicate otherwise.

² <https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00004716>

National Planning Policy

- 2.3.3 National Planning Framework 4 (NPF4) (Scottish Government, 2023) provides the national spatial strategy for Scotland, setting out the spatial principles, regional priorities, national developments and national planning policy. NPF4 now forms part of the statutory Development Plan along with Local Development Plans (LDPs) and superseded both National Planning Framework 3 (NPF3) and Scottish Planning Policy (SPP).
- 2.3.4 NPF4 highlights the strategic priority of net zero emissions by 2045 and the requirement for a just transition to net zero. Policy 1 of NPF4 requires that significant weight is given to the global climate and nature crises when considering all development proposals. Policy 11 supports all forms of renewable, low-carbon and zero emissions technology including enabling works, such as grid transmission and distribution infrastructure.
- 2.3.5 Section 24(3) of the Town and Country Planning (Scotland) Act 1997 states:
“In the event of any incompatibility between a provision of the National Planning Framework and a provision of a local development plan, whichever of them is the later in date is to prevail.”
- 2.3.6 In this instance, NPF4 would prevail if there is any incompatibility identified between NPF4 and the other elements of the LDP.

Local Development Plan and Policy

- 2.3.7 The Dumfries and Galloway Local Development Plan 2 (LDP2) (2019) does not directly identify electricity transmission, but addresses renewable energy generation and infrastructure development within the council. Policies IN1 and IN2 of the Dumfries and Galloway LDP2 state that the council will support renewable energy generation and/or storage proposals and wind energy proposals that are located, sited and designed appropriately. The acceptability of any proposed development will be assessed against several criteria, including landscape and visual impacts and cumulative impacts, to name but two.
- 2.3.8 The Dumfries and Galloway Council’s Wind Energy Supplementary Guidance (2020) discusses electricity cable connections in paragraphs Q5 and Q6, stating (amongst others) that where power lines cannot be undergrounded careful consideration should be given to the visual impacts of any pylons and the suitability of any route. Paragraph Q7 also highlights the need to consider the visual impact of the grid connection, especially where overland pylons are proposed.

Other Policy Material Considerations

- 2.3.9 Policy within the following are also considered material considerations:
- The Climate Change Scotland Act (2009), as amended by the Climate Change (Emissions Reduction Targets)(Scotland) Act 2019;
 - The Future of Energy in Scotland (Scottish Government, 2017);
 - Planning Advice Notes (PANs); and

- Scottish Government Web-based renewable energy advice.
- 2.3.10 In October 2020, the UK government announced its commitment towards net zero emissions by 2050. This forms part of the government's "*wider efforts to ensure the UK meets the legally binding target of reaching net zero emissions by 2050 and build back greener from coronavirus*". The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 sets a target year of 2045 for reaching net zero emissions in Scotland. The Scottish Government's Energy Strategy (2017) highlights the vital role that energy networks will play in meeting Scotland's decarbonisation and net zero targets. It also identified that infrastructure capable of delivering net zero needs to be delivered recognising and rewarding the impact of efficient, timely investment on our economy, on the development of skilled jobs, and the development of a dynamic supply chain, while ultimately providing a good deal for energy consumers. The Scottish Government's Climate Change Plan Update (December 2020) identified that the transition of our energy system to net zero presents Scotland's businesses with many opportunities to create a competitive advantage whilst creating jobs.
- 2.3.11 As mentioned above, NPF4 also highlights the strategic priority of net zero emissions by 2045.
- 2.3.12 The connection of renewable energy developments such as the Troston Loch Wind Farm to the grid would ensure that the energy generated by the wind farm is able to contribute to the target of net zero carbon emissions.

2.4 References

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03.

Route

Selection

3 Route Selection

3.1 Introduction

- 3.1.1 The objective of the route selection process was to identify a technically feasible and economically viable overhead line (OHL) route for a continuous 132 kV OHL connection between the planned Troston Loch Point of Connection (POC) and the Glenshimmeroch 132 kV collection point, which would cause least disturbance to people and the environment and the people who live, work and enjoy recreation within it.
- 3.1.2 SPEN standardises its route planning methodology 'Approach to Routeing and Environmental Impact Assessment' (2021) by using established standard industry practice for the routeing of OHLs; guidance on this was first developed by the late Lord Holford in 1959, known as the Holford Rules. Other guidance that is available regarding the routeing of OHLs is the Forestry Commission Guidelines.
- 3.1.3 SPEN's approach to routeing OHLs is primarily based on the idea that any major effect of an OHL will be visual, and that the degree of visual intrusion can be reduced by carefully routeing the development. Techniques to reduce visual intrusion of OHLs include using the topography and trees to provide screening and/or backclothing, as well as ensuring the OHL is routed at a distance away from settlements and roads where possible. Particularly sensitive and valued natural and man-made features should also be avoided, with a well-routed OHL also taking into account any other technical and environmental considerations.

3.2 Methodology

- 3.2.1 In accordance with SPEN's approach to routeing, the routeing strategy for the Troston OHL grid connection project was:
- To identify a technically feasible and economically viable route between the Troston Loch Wind Farm POC and the Glenshimmeroch collector substation whilst taking into consideration environmental, technical and economic constraints. The route should, on balance, cause the least disturbance to the environment and the people who live, work and enjoy outdoor recreation within it.
 - To help minimise landscape and visual effects, in accordance with the Holford Rules and SPEN's routeing methodology, the proposed OHL has also sought to avoid high ground and ridgelines, responding to the grain of the landscape, subject to avoiding areas of highest amenity and environmental values as far as practicable (as above). To help assess temporary and permanent cumulative effects, careful consideration has also been given to the relationship of the proposed OHL with other electricity infrastructure within the study area.

3.2.2 In line with the routing strategy the following sequential stages were adhered to, in accordance with SPEN's approach to routing guidance.

Stage 1: Development of route options

3.2.3 Considerations identified in the routing strategy were applied to the study area to establish a number of possible 'route options'. This process involved designing routes in accordance with the Holford Rules, that best fit the landscape and minimised effects on visual amenity, whilst avoiding wherever possible designated areas of high environmental value and irreplaceable habitat.

3.2.4 A study area, shown in Figure 3.1, was defined for the routing process, large enough to accommodate the identification of several potential route options. Following the establishment of the study area, an initial evaluation of environmental and technical constraints was undertaken through desk-based studies and field surveys.

3.2.5 In response to the identification of the key environmental, planning and technical constraints, a sensitivity weighting (hard constraint, moderate constraint or soft constraint) was defined on an aspect-by-aspect basis, for each environmental feature identified. This was undertaken with reference to Holford Rules 1 and 2 and by using relevant guidance and professional judgement relating to designations and their sensitivities.

3.2.6 Holford Rules 1 and 2 were applied to these strategic constraints using the following hierarchy to identify and refine potential route options:

- Avoid European designated sites, residences, scheduled monuments, inventory of gardens and designed landscapes, inventory battlefields, listed buildings and non-designated heritage assets of potentially national significance.
- Preferably avoid or limit routing of OHL within Sites of Special Scientific Interest (SSSI); RSPB Bird Sensitive Areas; native/nearly-native woodland; Class 1 and 2 peat areas, 150 m buffer to private water supplies (PWS) and 100 m buffer to existing and committed residential properties.
- Cultural heritage assets should be considered from a setting perspective where they are of national importance, or where the setting is pertinent to its citation.
- Where it is possible to do so, avoid or limit routing the OHL within sensitive habitats (e.g. Groundwater Dependent Terrestrial Ecosystems), natural or semi-natural forested areas and peat.

3.2.7 Using the existing environmental, planning and technical information available for the study area as well as information generated through desk-based studies and field surveys undertaken specifically within the study area, it was possible to delineate several route segments which could be used in different combinations to identify ten potential route options, which are shown in Figure 3.2.

Stage 2: Appraisal of route options and selection of preferred route

- 3.2.8 To allow identification of a preferred route, an appraisal of the ten potential route options was undertaken. The purpose of this was to identify the relative potential of each route option to accommodate an OHL, including a focus on potential landscape and visual impacts of the options as directed by Holford Rules.
- 3.2.9 The appraisal of the identified route options for the planned Troston OHL grid connection was carried out by each environmental discipline in order to identify a preferred route. The environmental appraisal comprised a qualitative appraisal of each route option, and the appraisal considered the potential interaction of the planned OHL with key environmental features and associated sensitivities for each route option so that these could be directly compared.
- 3.2.10 Technical considerations such as existing infrastructure, altitude and slope angle, and physical constraints were also considered as a guide to routeing. The approach taken was to identify preferred environmental options informed by a staged review of technical issues.
- 3.2.11 Following the appraisal of each route option a preferred route was identified based on the comparative merits of each option. The preferred route option is shown in Figure 3.3.

Stage 4: Consultation on the preferred route

- 3.2.12 In order to ensure that views and opinions have been gathered from relevant stakeholders to inform the route option selection process, a consultation exercise was carried out in October 2022.

Stage 5: Modification of the preferred route

- 3.2.13 Following the consultation, all responses were considered and their relevance to the selection of the route options/preferred option assessed/identified.

Stage 6: Selection of the proposed route

- 3.2.14 Following the consultation period and confirmation of the preferred route, a proposed route was identified for the purpose of obtaining a Section 37 consent.

3.3 Consideration of Alternatives

- 3.3.1 As stated in Section 3.2.8 above, ten potential route options were identified for consideration (see Figure 3.2). The route options were named Route Option A, B, C, D, E, F, G, H, I and J for simplicity.
- 3.3.2 Route Options F - I were considered to be technically constrained as these route options passed between wind turbines with constraints on physical space for the construction works and potential for wake effects. Route Option C was identified as the least preferred option due to proximity to archaeological remains, a black grouse lekking site, breeding curlew and snipe, sensitive habitats, peat, several watercourse crossings and crossings of the National Byway Cycle Route and

Southern Upland Way (SUW). Route Options D and E followed part of the same route as Route Option C and therefore had some of the same constraints as above.

3.4 Proposed Route

- 3.4.1 Route Option A was identified as the preferred option for six out of the nine environmental aspects considered and it was also the shortest route. The shorter distance would result in less disturbance to habitats and potentially previously unidentified archaeology. The proposed OHL route avoids crossing the SUW and National Byway Cycle Route. Due to its isolated location, it would have limited visual impact and it does not cross any landscape designations. The proposed OHL route has sought to avoid areas of peat, private water supplies (PWS) and minimise the requirement for watercourse crossings.
- 3.4.2 However, it was the least preferred route in terms of ornithology as it passes in close proximity to a black grouse lekking site and an area where breeding curlew and snipe have been recorded. Black grouse lek surveys undertaken by RSK in 2022 found no evidence of black grouse using the previously recorded lek. In addition, mitigation measures in the form of line markers could be used to reduce the potential collision risk for black grouse and other birds.
- 3.4.3 In conclusion, when all the environmental aspects and likely effects were considered, on balance, Route Option A, with the inclusion of mitigation, was considered to be the most preferable from an environmental perspective. Route Option A was therefore taken forward as the preferred route.
- 3.4.4 The preferred route was consulted on in October 2022 to obtain feedback from statutory and non-statutory consultees and members of the public. Further information on the consultation process is provided in Chapter 5. Following consideration of the consultation responses, the proposed route was determined.
- 3.4.5 Following further environmental and technical assessments, the alignment of the OHL within the route corridor was established. The alignment of the proposed OHL route was modified during the design stage to avoid an area of peat and heritage assets.

3.5 Summary

- 3.5.1 To summarise, with the goal of establishing a viable OHL route for a continuous 132 kV OHL connection between the planned Troston Loch POC and the Glenshimmeroch 132 kV collector substation without interrupting and/or harming local environment and social processes, the SPEN standardised route planning methodology was used. The route, on balance, should cause as little disturbance as possible.
- 3.5.2 In accordance with the Holford Rules, a number of potential route options were identified based on the constraints within the study area. Each route option was appraised by different environmental disciplines to determine the preferred route. Consultation then took place to incorporate the views of members of the public and various stakeholders.

3.5.3 From this process, Route Option A is presented as the proposed route because it would have the least impact on the surrounding environment and society, compared to the other route options assessed.

04.

**Proposed
Development**

4 Proposed Development

4.1 Introduction

4.1.1 The proposed development is the establishment of an overhead line (OHL) to connect the consented Troston Loch Wind Farm to the national energy grid. This will enable energy that is generated by the Troston Loch Wind Farm to be transmitted into the national grid and thereby contribute to the UK's energy supply. This chapter describes the characteristics of the proposed development and its components as well as the nature of phases of the proposed development including construction, operation and decommissioning.

Location of the Proposed Development

4.1.2 The route of the proposed OHL is located between the planned Troston Loch Wind Farm's Point of Connection (POC) (NGR E267516, N588834) and the consented Glenshimmeroch collector substation (NGR E264779, N587363) as shown in Figure 4.1. The Glenshimmeroch collector substation is located approximately 6.2 km north-east of St John's Town of Dalry and the Troston Loch POC is located approximately 10.4 km south-west of Moniaive in Dumfries and Galloway.

4.1.3 The proposed OHL route is within a rural area and passes through mostly rough grazing land (marshy grassland) and commercial forestry. The proposed OHL route is located within the transition area of the Galloway and Southern Ayrshire UNESCO Biosphere, which is the outer area of the biosphere where communities foster socio-culturally and ecologically sustainable economic and human activities (Dumfries and Galloway, 2019). There are no other areas on or around the proposed OHL route that are protected under international or national legislation for their ecological, landscape, cultural heritage or other value. Several renewable energy developments in the surrounding area have received consent but are yet to undergo construction:

- Troston Loch Wind Farm (application reference ECU00001785);
- Glenshimmeroch Wind Farm (appeal references PPA-170-2138/PPA-170-2149);
- Margree Wind Farm (appeal reference PPA-170-2153).

4.1.4 In addition, an application for Divot Hill Wind Farm (application reference 23/0368/FUL), to be located to the south of Margree Wind Farm, was submitted in February 2023 and is yet to be determined.

4.1.5 The closest settlement is a small group of properties at Kendoon, over 4 km to the west of the proposed OHL route. There are a very small number of scattered and isolated residential properties within the surrounding area, the closest of which is Glenshimmeroch located approximately 780 m south of the OHL and 720 m south of one of the temporary construction compound; and Auchenshinnoch and Fingland, located over 1 km north of the OHL and approximately 820 m from one of the temporary construction compounds.

4.2 Overview of the Proposed Development

- 4.2.1 The proposed development is the construction of a new 3.7 km-long 132 kV single circuit wood pole OHL between the Troston Loch substation and the Glenshimmeroch collector substation. A short section of underground cable is also required to connect the OHL to the Glenshimmeroch collector substation.

4.3 Limits of Deviation

- 4.3.1 The maximum horizontal Limits of Deviation (LoD) or Infrastructure Location Allowance (ILA) is proposed to be 50 m either side of the proposed OHL route, to allow for micro-siting of the wood poles and associated infrastructure, as shown on Figure 4.1.
- 4.3.2 The maximum vertical LoD is 18 m above ground level. The wood poles would be H poles (rather than single poles) of between 10 and 18 m high, with a typical height of 12 m. Poles may vary in height in order to respond to local topographical variations, engineering and safety considerations.

4.4 Proposed Development Components

Wood Poles

- 4.4.1 Forty-nine double (also known as 'H') wood poles are proposed for the single circuit 132 kV OHL. Wood poles are fabricated from pressure impregnated softwood, treated with a preservative to prevent damage to structural integrity. New wood poles are dark brown in colour and weather over the years to a light grey. Three types of wood poles would be required:
- Intermediate: where the pole forms part of a straight-line section;
 - Angle deviation/section: where the OHL requires a change of direction, all angle structures would require to be back stayed; and
 - Terminal: where the OHL terminates into a substation or on to an underground cable section via a cable sealing end compound.
- 4.4.2 Photos 4.1 to 4.3, below, show some examples of typical trident wood pole structures, and it is anticipated that similar poles and structures would be used for the proposed OHL.



Photo 4.1: Example of a typical 132 kV H-pole trident OHL (SPEN, 2021)



Photo 4.2: Example of a typical intermediate section of a trident wood pole supporting a 132 kV OHL (SPEN, 2021)



Photo 4.3: Example of typical terminal structures of a trident 132 kV OHL (SPEN, 2019)

- 4.4.4 The size of poles and span lengths would vary depending on several factors, in line with the industry Energy Networks Association specification ENA TS 43-50 Issue 3. The wood pole heights would range from 10 to 16 m, with a typical height of 12 m.
- 4.4.5 The spans between poles range from 63 m to 90 m with an average span length of 77 m to accommodate environmental and technical constraints and variations in topography.
- 4.4.6 The wood pole would support three conductors (wires) in a horizontal flat formation. Insulators, attached to the pole cross-arms, support the conductors and prevent the electric current from crossing to the pole body.

Underground Cable

- 4.4.7 Approximately 77.5 m of underground cable would be installed to connect the proposed OHL with the Glenshimmeroch collector substation.

Ancillary Development

- 4.4.8 In addition to the components detailed above, which are considered to be permanent for the purposes of the applications for Section 37 consent and deemed planning permission, other ancillary development would be required during the felling and construction phase. This ancillary development would be temporary, during the felling and construction phases only, and would be removed and the land reinstated once the proposed development is commissioned.
- 4.4.9 Deemed planning permission is sought for these ancillary components comprising:
- 60 m wayleave for the proposed OHL route;
 - Access tracks;
 - Access from public roads;
 - Watercourse crossings;
 - Working areas (around wood poles) each measuring approximately 30 m by 20 m;
 - Up to four construction compounds/laydown areas measuring approximately 20 m by 20 m; and
 - Winching/pulling areas measuring approximately 30 m by 20 m.

4.5 The Construction Phase

- 4.5.1 The construction programme is anticipated to take approximately 10 months. OHL construction typically follows a standard sequence of events as follows:
- Prepare access to the pole locations;
 - Erect wood poles;
 - String conductors; and
 - Reinststate pole sites and any other disturbed ground.
- 4.5.2 Construction activities for the proposed development would be undertaken on Monday to Friday during daytime periods only, between 07.00 and 19.00 for felling and access installation in summer (April to September) and 7.30 to 17.00 (or as daylight allows) in winter (October to March) for all other activities. There may be a requirement to work at weekends. Where required, weekend working would only take place where there are no human or environmental sensitivities. It is anticipated that any variations to the hours stated here would be agreed in advance with Dumfries and Galloway Council.

- 4.5.3 A Construction Environmental Management Plan (CEMP) would be implemented during the construction of the OHL to control pollution and nuisance, such as dust and noise.
- 4.5.4 Construction and erection of an H pole generally takes three to four weeks per kilometre depending on ground conditions and location, i.e. it may take longer if the ground is softer or if shallow rock is encountered.

Access and Pre-construction Works

- 4.5.5 The northern section of the proposed OHL route would be accessed from the U141S to the north-west of the proposed development. Access to the Glenshimmeroch collector substation and the southern part of the proposed OHL route can be gained via existing forestry tracks and via the via the C51S leading eastwards from its junction with B7000.
- 4.5.6 Temporary access would be constructed, as necessary, and laydown/storage areas established to facilitate development depending on ground conditions. Temporary access would be a mixture of trackway panels and temporary stone roads. Where possible, existing forestry tracks are proposed to be used.
- 4.5.7 Up to four temporary construction compounds, including laydown areas, would be required, measuring approximately 20 m by 20 m. These would be used for storage of material, equipment, site offices and staff welfare facilities.
- 4.5.8 Preparatory works for the temporary construction compounds would involve some site clearance work, minor earthworks operations to level the site, drainage works for the car park and service installation, including electrical, communications, water and sewerage facilities. Pole storage would be in a bunded area away from any watercourses and controls would be implemented to prevent potential contamination.
- 4.5.9 Temporary working areas would be required around each pole location for foundation excavation and pole erection, with the average dimensions of typical working areas being 30 m x 20 m.
- 4.5.10 The location of the temporary access tracks, construction compounds and working areas are shown on Figure 4.1.

Watercourse Crossings

- 4.5.11 The proposed development has been designed to minimise the number of watercourse crossings; however, where a new temporary access track is required to cross a watercourse, a temporary bridge or culvert would be used. No works would take place within the watercourse.

Tree Felling

- 4.5.12 The felling of some woodland and individual trees would be required to physically construct the proposed development and also to maintain the statutory clearances required for its safe operation and maintenance reasons. The minimum clearance corridor (wayleave or servitude right) required for construction and operation of the

OHL is 60 m (30 m either side of the OHL). Therefore, there is a minimum wayleave required through commercial forestry of 60 m to protect the OHL and ensure the safety of forestry operatives.

- 4.5.13 Felling would be undertaken utilising a mixture of mechanical harvesting, mulching and hand felling techniques. Further information is provided in Chapter 10: Forestry Appraisal.

OHL Installation

- 4.5.14 For wood pole line construction, the 'poles' would be erected using normal agricultural machinery such as an excavator with a lifting arm. A tracked excavator and low ground-pressure vehicles, (e.g. tractor, all-terrain vehicles, quad bikes) are used to deliver, assemble and erect each wood pole structure at each location. The erection of the wood poles requires a typical excavation of 3 m² x 2 m deep. The excavated material is segregated into appropriate layers and used for backfilling. It is anticipated that all material excavated for the installation of the poles would be used in backfilling the excavations. Any generated waste would be removed from site and treated in accordance with the Site Waste Management Plan (SWMP).
- 4.5.15 Poles are erected in sections, i.e. between angle support poles and/or terminal support pole. The insulator fittings, and wood poles forming the pole support, would be assembled local to the pole site and lifted into position utilising the tracked excavator which excavated the foundations. The pole foundation holes would then be backfilled, and the pole stay wire supports attached to the ground in preparation for conductor stringing, erection and tensioning.
- 4.5.16 The conductors would be winched to/pulled from the section poles; these poles therefore require access for heavy vehicles to transport the conductor drums and large winches.
- 4.5.17 Following commissioning of the OHL, all equipment and temporary access of construction areas would be removed with the land being reinstated to the satisfaction of the landowner.

Underground Cable Installation

- 4.5.18 Underground cable trenches would be created using tracked mechanical excavators. The working width would then be cleared of vegetation and topsoil would be stripped from the areas of ground to be disturbed. The excavated topsoil and subsoil would be stored separately within the working area in accordance with best practice in order that it can be replaced once the installation of the underground cable is complete.
- 4.5.19 Following trench excavation, a thin layer of stabilised backfill (sand based material) would be deposited into the trench to act as bedding for the cable ducts which would then be lowered into the trench. The trench would then be backfilled, using a stabilised backfill material up to the protection tiles with the originally excavated material above the protection tiles. During backfilling, protective cover and warning tapes would be placed over the cable circuits.

- 4.5.20 Cable pulling through the ducts can take place at any time after the ducts have been installed and backfilled, as the ducts are left unfilled after installation.
- 4.5.21 Once all cable works have been completed the land would be reinstated to its previous condition and uses in consultation with the landowners.

4.6 The Operation Phase

- 4.6.1 Once operational, the OHL would be monitored and inspected by SPEN overhead linemen, most likely patrolling on foot. Where maintenance is required, SPEN standard procedures would be followed, but would limit the use of vehicles to low ground pressure vehicles and would adhere to the same principles of reinstatement of disturbed ground to the satisfaction of the landowner, and in compliance with conditions imposed by any consent/licence granted by the authorities prior to the commencement of maintenance works.
- 4.6.2 Information pertaining to any sensitive environmental aspects along the route of the OHL and any consent and/or licence conditions would be passed on to SPEN field operatives ahead of maintenance patrols and repair work to minimise potential impacts during the operational phase of the OHL.

4.7 The Decommissioning Phase

- 4.7.1 When the operational life of the proposed development comes to an end, it is possible that the proposed OHL may be reequipped with new conductors and insulators (30 to 40 years) and the wood poles replaced. Alternatively, the OHL may be decommissioned fully. On this basis, the operational environmental effects of the proposed development are considered to be long term.
- 4.7.2 Underground cables have a life expectancy of approximately 40-50 years. However, it is quite feasible that the new cables would last beyond this, and SPEN would seek to utilise a maximum life expectancy.

4.8 References

Dumfries and Galloway Council. (2019). Local Development Plan 2. Adopted October 2019. Available at: https://www.dumgal.gov.uk/media/21885/Adopted-Local-Development-Plan-2/pdf/Adopted_LDP2_OCTOBER_2019_web_version.pdf?m=637060550180970000, Accessed November 2023.

Energy Networks Association (UK), (2022), Specification for single circuit overhead lines on wood poles for use at 132kV. ENA TS 43-50 ISSUE 3:2022.

05.

Consultation

5 Consultation

5.1 Introduction

- 5.1.1 Pre-application consultation is not a statutory requirement for Section 37 applications under the Electricity Act 1989, however, SPEN attaches great importance to the effect that its works may have on the environment and on people. In seeking to achieve 'least disturbance', SPEN is keen to engage with stakeholders including local communities and others who may have an interest in the project. This engagement process begins at the early stages of development of projects to ensure that the project design balances the views of stakeholders and communities with SPEN's statutory obligations.
- 5.1.2 This chapter summarises the consultation process that was undertaken, with further details provided in the Pre-application Consultation (PAC) Report.

5.2 Consultation

Routeing Consultation

- 5.2.1 Having identified the preferred route option, public consultation was undertaken between 3 and 24 October 2022 to invite views on the preferred route for proposed development and information of any other issues, suggestions or feedback. The main objective of public consultation during routeing was to provide an opportunity for consultees, communities and individuals to contribute their views and opinions on a preferred route, to enable SPEN to take all potential aspects and environmental impacts into consideration when selecting the proposed overhead line (OHL) route.
- 5.2.2 Information on the proposed development was hosted on SPEN's website³, which is a free, publicly accessible web domain. The website provided information relating to the OHL routeing exercise that had been undertaken and the preferred route that had been identified. In addition to the information held on the website, two online public consultation events were held to provide a presentation on the proposed development and allow members of the public to directly ask questions of the project team.
- 5.2.3 The public consultation events were advertised in a variety of different methods. The events were advertised in the Galloway News and the Dumfries and Galloway Standard, and postcard-style information leaflets were posted to all residences within a 5 km radius of the study area. An email notification was sent to local councillors and community councils and statutory and non-statutory consultees.

³ www.spenergynetworks.co.uk/pages/troston_loch_wind_farm_connection.aspx

5.2.4 Following public consultation, all responses were considered and their relevance to the preferred route assessed. In light of this the preferred route was reviewed and taken forward as the proposed route.

5.3 EIA Screening

5.3.1 A request for a Screening Opinion was made to the Energy Consents Unit (ECU) on 10 January 2023 under regulation 8(1) of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (“the EIA Regulations”). The ECU consulted Dumfries and Galloway Council, as the relevant planning authority on 12 January 2023 (reference ECU00004716)⁴.

5.3.2 Dumfries and Galloway Council responded on 2 June 2023, stating their view that the proposed development does not constitute EIA development. The council also stated that information detailing anticipated effects on ecology, ornithology, noise, hydrology and landscape and visual should accompany any subsequent planning application.

5.3.3 This environmental appraisal provides the required information to support the Section 37 application in Chapters 6 to 11.

5.3.4 A noise assessment has been scoped out the appraisal because of the distance to nearest residential receptors (over 700 m) and the short-term nature of the construction works. The works are linear in the nature and are of a short duration at any one location. The noise generated by construction of the OHL would quickly diminish as the construction progresses, moving the activity away from each noise-sensitive location as construction and decommissioning continues. Due to the short-term and localised nature of the construction and decommissioning processes for the OHL and the temporary construction compounds, any temporary noise created is likely to be minimal and concentrated in small areas at any one time as the contractors progress along the course of the route.

5.3.5 In addition, noise impacts would be addressed in the schedule of mitigation measures to be included in the CEMP. Liaison with landowners and local residents would be carried out so that disruption is minimised throughout all stages of the development and construction of the project.

5.3.6 There would be limited generation of noise during the operation stage.

⁴ <https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00004716>

06.

**Landscape
and Visual
Appraisal**

6 Landscape and Visual Appraisal

6.1 Introduction

6.1.1 This chapter presents a Landscape and Visual Appraisal (LVA) of the proposed development. It considers the existing landscape and visual baseline environments within the study area; assesses their sensitivity to change; describes the key landscape and visual related aspects of the proposed development; describes the nature of the anticipated changes and assesses the effects arising during construction and once completed.

6.1.2 This chapter has been prepared by Chartered Landscape Architects at Stephenson Halliday, part of the RSK Group. Stephenson Halliday has over 20 years of experience working on grid connection proposals throughout the UK. Stephenson Halliday is a Landscape Institute and Institute of Environmental Management and Assessment (IEMA) registered practice and all work is prepared and reviewed internally by senior highly experienced landscape planners.

6.1.3 This chapter is supported by the following figures and appendices:

- Figure 6.1 LVA Study Area;
- Figure 6.2a Zone of Theoretical Visibility with Screening;
- Figure 6.2b Zone of Theoretical Visibility;
- Figure 6.3 Landscape Character, Designations and Access;
- Figure 6.4 Topography and Landcover;
- Appendix 6.1 LVA Methodology;
- Appendix 6.2 Visualisation Methodology;
- Appendix 6.3 Landscape Sensitivity;
- Appendix 6.4 Viewpoint Analysis; and
- Appendix 6.5 Viewpoints and Wirelines.

6.1.4 The appendices are important to the LVA and should be read alongside this chapter. Key terms used within the LVA are described in Section 6.2 Methodology below and Appendix 6.1, which also includes a glossary of terms.

The Proposed OHL Route

6.1.5 The proposed development is a 3.7 km-long trident wood pole overhead line (OHL) located between the planned Troston Loch Wind Farm's point of connection (POC), approximately 10.4 km south-west of Moniaive, and the consented Glenshimmeroch collector substation, approximately 6.2 km north-east of St Johns Town of Dalry, within Dumfries and Galloway. Figures 6.1, 6.3 and 6.4 illustrate the landscape environment of the study area and places the proposed development within its local context.

Further details on the proposed development are provided in Chapter 4 of this Report and Section 6.5 below. The proposed OHL route and LVA study area are described in greater detail in Section 6.4 below.

6.2 Methodology

Consultation

- 6.2.1 The Scottish Ministers via the Energy Consents Unit (ECU) determined that the proposed development does not constitute Environmental Impact Assessment (EIA) development. The ECU recorded that the proposed development would result in small scale, not significant, landscape and visual impacts. In these circumstances the chapter takes the form of a LVA rather than a full Landscape and Visual Impact Assessment (LVIA) and as such makes no reference to “significant effects” as required by the EIA Regulations.
- 6.2.2 Correspondence was sent to the planning officer at Dumfries and Galloway Council regarding the scope of the LVA, including study area, viewpoints, cumulative assessment and visualisation types on 22 November 2023. A response was received on 10 January 2024 which indicated that the proposed level of appraisal would be proportionate and appropriate. In addition, the council highlighted the need for the Section 37 application to include details of existing and consented OHLs to be identified within the study area; and for the assessment to include cumulative effects if applicable.

Methodology

- 6.2.3 The detail of the methodology is described in Appendix 6.1. A summary of the primary judgements is provided below. The methodology is formed around key principles of the Landscape Institute’s Guidelines for Landscape and Visual Impact Assessment 3 (GLVIA3) (2013).

Sensitivity

- 6.2.4 Sensitivity is judged taking into account the component judgments about the value and susceptibility of the receptor as illustrated by Table 6.1 below. Where sensitivity is judged to lie between levels, an intermediate assessment will be adopted. A slightly greater weight is given to susceptibility in judging sensitivity of visual receptors as indicated by Table 6.2 below.

Table 6.1: Landscape Sensitivity

Landscape Receptor		Susceptibility		
		High	Medium	Low
Value	National	High	High/Medium	Medium
	Regional	High/Medium	Medium	Medium/Low
	Community	Medium	Medium/Low	Low

Table 6.2: Visual Sensitivity

Visual Receptor		Susceptibility		
		High	Medium	Low
Value	National	High	High/Medium	Medium
	Regional	High/Medium	Medium	Medium/Low
	Community	Medium	Medium/Low	Low

Magnitude

6.2.5 Scale of effect is the primary factor in determining magnitude, which may be higher if the effect is particularly widespread and/or long lasting, or lower if it is constrained in geographic extent and/or timescale. Table 6.3 below illustrates how this judgement is considered as a two-step process.

Table 6.3: Magnitude

Scale / extent	Large	Medium	Small	Negligible
Wide	Substantial			
Intermediate		Moderate		
Localised			Slight	
Limited				Negligible

Stage 1 Result / Duration	Substantial	Moderate	Slight	Negligible
Permanent	Substantial			
Long-term		Moderate		
Medium-term			Slight	
Short-term				Negligible

6.2.6 Where magnitude is judged to lie between levels, an intermediate assessment will be adopted.

Significance of Effects

6.2.7 The significance of any identified landscape or visual effect is assessed as major, moderate, minor, or negligible. These categories are based on the consideration of sensitivity with the predicted magnitude of change. Table 6.4 below is not used as a prescriptive tool and illustrates the typical outcomes, allowing for the exercise of professional judgement. In some instances, a particular parameter may be considered as having a determining effect on the analysis.

Table 6.4: Visual Sensitivity

		Magnitude of Change			
		Substantial	Moderate	Slight	Negligible
Receptor Sensitivity	High	Major	Major/ Moderate	Moderate	Minor
	Medium	Major/ Moderate	Moderate	Moderate/ Minor	Minor/ Negligible
	Low	Moderate	Moderate/ Minor	Minor	Negligible

Beneficial/Adverse

6.2.8 Landscape and visual effects can be beneficial or adverse and in some instances may be considered neutral. Neutral effects are those which overall are neither adverse nor positive but may incorporate a combination of both.

Cumulative Assessment

6.2.9 It is noted that the Scottish Ministers referenced potential cumulative effects arising in combination with the two consented Troston Loch and Glenshimmeroch wind farms in the EIA screening opinion for the proposed OHL route (reference ECU00004716). This appraisal does not include a cumulative landscape and visual impact assessment (CLVIA). The reasoning for this is that identified effects from the proposed OHL are small scale and only over localised areas (see Section 6.6 below); in addition the proposed trident wood pole structures are of such small scale, in comparison to the consented wind turbines, that it is considered there would not be any significant landscape or cumulative effects arising from the proposed OHL in addition to the wind farms, and as such a CLVIA has not been undertaken. This is in line with the GLVIA3, best practice guidelines for LVIA /LVA written by the Landscape Institute and IEMA, which stresses “*that the approach to assessment needs to be proportionate to the scale of the project being assessed and the nature of the likely effects*”.

6.2.10 With regard to other OHL projects, there are no proposed or consented OHLs within a distance of 2.6 km (being double the distance of the identified study area as

detailed below) from the proposed OHL route and as such a CLVIA has not been undertaken. All operational developments, and those under construction, as per LVIA guidance and best practice, are considered within the existing environmental baseline against which the proposed OHL route is assessed.

Residential Amenity

- 6.2.11 As set out within the Landscape Institute's Technical Guidance Note 02//19 (2019) 'Residential Visual Amenity Assessment (RVAA)':

"Changes in views and visual amenity are considered in the planning process. In respect of private views and visual amenity, it is widely known that, no one has 'a right to a view.' ...

It is not uncommon for significant adverse effects on views and visual amenity to be experienced by people at their place of residence as a result of introducing a new development into the landscape. In itself this does not necessarily cause particular planning concern. However, there are situations where the effect on the outlook / visual amenity of a residential property is so great that it is not generally considered to be in the public interest to permit such conditions to occur where they did not exist before."

- 6.2.12 This chapter does not include an assessment of residential visual amenity as it is judged that the proposed development would not give rise to effects meeting the threshold described above.

Distances

- 6.2.13 Where distances are given in the assessment, these are approximate distances between the nearest part of the proposed OHL route and the nearest part of the receptor in question, unless explicitly stated otherwise.

Visual Aids

- 6.2.14 Four representative viewpoints, together with photo-wireline models, have been included with the LVA in order to inform the assessment.
- 6.2.15 The method of visualisation selected has been informed by the Landscape Institute's Technical Note 6/19 Visual Representation of Development Proposals (2019). The methodology of production for the visualisations is described within Appendix 6.2.

Study Area

- 6.2.16 It is accepted practice within landscape and visual assessment work that the extent of the study area for a development proposal is broadly defined by the visual envelope of the proposed development.
- 6.2.17 In this case, an initial search area of 2 km was used to generate a Zone of Theoretical Visibility (ZTV) study to inform the study area. This illustrated that the main area of potential visibility was from the landscape to the north of the proposed development. The ZTV (Figure 6.2b) is a worst-case scenario and based

on bare ground modelling i.e. it does not include the forestry within the study area. It was decided not to include forestry within the ZTV modelling as a definitive plan of what would be removed was not available, and therefore a worst-case scenario has been assumed. Following production of the ZTV and an initial site survey, it was deemed unlikely there would be prominent landscape or visual effects arising at a distance of greater than 1 km from the proposed OHL route; however a 1.3 km study area was adopted (as illustrated on Figures 6.1 – 6.4), instead of 1 km, to include the closest residential receptors located to the north of the proposed development. The study area is sufficient to identify all potentially prominent effects on landscape and/or visual amenity.

Assumptions

- 6.2.18 The local forestry is commercial forestry, and the felling and replacement of trees is rotated. For the purposes of this chapter, it is assumed that the forestry would remain in place with the exception of a 60 m-wide corridor around the proposed alignment of the OHL. An exception is within the bare earth ZTV (Figure 6.2b) where a worst case scenario of all the forestry being removed has been assumed.

Legislation, Policy and Guidance

National Planning Policy

- 6.2.19 Relevant national planning policy is provided within National Planning Framework 4 (NPF4) (Scottish Government, 2023).

Local Planning Policy

- 6.2.20 The proposed OHL route is located within the Dumfries and Galloway Council administrative area. Current local planning policy is described in the Dumfries and Galloway Local Development Plan 2 (LDP2) (adopted October 2019). Though there is no specific policy regarding OHL development within LDP2, there are operational and consented wind farms to the north-east, east and south of the proposed OHL route, and general advice on the siting, design and impact of renewable energy – as listed below – is translatable to OHL development. Policies relevant to this assessment include:

- Policy OPI: ‘Development Considerations’ – which requires that: *“Development proposals should respect, protect and/or enhance the region’s rich landscape character, and scenic qualities, including features and sites identified for their landscape qualities or wild land character as identified on the 2014 Scottish National Heritage map (or any subsequent revised or amended map) of wild land areas. They should also reflect the scale and local distinctiveness of the landscape. The detailed guidance set out in the Dumfries and Galloway Landscape Assessment, and any subsequent revised or amended document, will be a material consideration in the assessment of proposals.”*
- Policy INI: ‘Renewable Energy’ – which states (inter alia) that: *“The Council will support development proposals for all renewable energy generation and/or storage which are located, sited and designed appropriately. The acceptability*

of any proposed development will be assessed against the following considerations:

1. *landscape and visual impact;*
2. *cumulative impact;*
3. *impact on local communities and individual dwellings, including visual impact, residential amenity, noise and shadow flicker;...*

Local Guidance

- 6.2.21 In addition to, and as referenced in the policies set out above, Dumfries and Galloway Council has adopted Supplementary Guidance on Renewable energy, specifically wind energy in relation to landscape character, which is detailed in:
- Wind Energy Development: Development Management Considerations (Dumfries and Galloway Council, 2020); and
 - Appendix 'C' Dumfries & Galloway Wind Farm Landscape Capacity Study (2011, updated 2020).
- 6.2.22 The Dumfries and Galloway Council Guidance Appendix C defines landscape character areas, their key features and sensitivities and potential capacity for renewable energy development. The Guidance is geared towards wind turbine development, and does not include information specific to OHL proposals; however it is a source for landscape character definitions and sensitivities within the study area and has been used as supplementary information to the 2019 NatureScot National Landscape Character Assessment, to help establish and describe the existing landscape baseline.

6.3 Existing Environment

Introduction

- 6.3.1 An overview of the baseline conditions is provided in this section with the full baseline description of individual landscape and visual receptors being provided alongside the assessment both below from paragraph 6.3.4 and in Section 6.5 for ease of reference.
- 6.3.2 This section provides a review of the key baseline studies and identifies those landscape and visual receptors which merit detailed consideration in the assessment of effects, and those which are not taken forward for further assessment as effects *“have been judged unlikely to occur or are so insignificant that it is not essential to consider them further”* (GLVIA3, para. 3.19).
- 6.3.3 To inform the assessment, site visits were made to various locations within the study area including, but not restricted to, representative viewpoint locations, by Stephenson Halliday’s assessment team in September 2021 and October 2023.

The Proposed OHL Route and Study Area

- 6.3.4 The southern end of the proposed OHL route at the Glenshimmeroch Collector Substation is located approximately 6.2 km north-east of St Johns Town of Dalry and the northern end of the route at the Troston Loch POC is located approximately 10.4 km south-west of Moniaive within Dumfries and Galloway. The proposed OHL route is located to the north of Glenshimmeroch Hill and south of the B729.
- 6.3.5 The route of the OHL goes along the northern and north-west slope of Glenshimmeroch Hill; through areas of commercial coniferous forestry and some open moorland. The route and study area are intersected by a number of private tracks within the forestry and watercourses. The study area includes higher ground comprised of forested hilltops at Craigencorr Hill, Glenshimmeroch Hill and Kilnair Hill, and a natural low-lying corridor surrounding the Black Water which runs east to west across the northern edge of the forestry. There are three properties within the study area, Glenshimmeroch (outside the ZTV) to the south and Auchenshinnoch and Fingland to the north. The Southern Upland Way (SUW) passes through the west of the study area between Old Hill of Mackilston and Culmark Hill. In addition to the SUW there is a core path running west out of the study area from the SUW at Butterhole Bridge.
- 6.3.6 There are two existing wood pole OHLs within the study area. One, of similar type and design as the proposed OHL route, crosses the south-west of the study area and south-west slopes of Glenshimmeroch Hill and for a short distance would be near to the southern end of the proposed OHL route at the Glenshimmeroch Collector Substation. The second is a low voltage OHL in the north of the study area, connecting to the properties at Auchenshinnoch and Fingland.

ZTV Study

- 6.3.7 A ZTV study was generated based on the proposed design. The ZTV on Figure 6.2b indicates areas of potential visibility with a bare earth model, which does not take into account the screening effects of forestry. The ZTV on Figure 6.2a indicates areas of potential visibility including screening effects of the existing forestry (modelled at a height of 15 m), less a 60 m corridor of felled forestry along the route of the OHL. This ZTV has been based upon the latest modelling data available at November 2023 and it is recognised that all felling within the study area may not be accurately represented in the latest available data.
- 6.3.8 The wood poles were modelled between 10 m and 18 m in height as per the identified above ground height of the poles within the design model of the OHL. The ZTV is illustrative of the potential visibility on completion of construction.
- 6.3.9 The ZTV study was used to aid the identification of those receptors that are likely to be most affected by the proposed development and those that do not require detailed consideration. The ZTV shows that the main potential area of visibility is seen to the north of the Fingland U141S local road in the west of the study area from Marskaig Hill, extending north towards Culmark Hill and around to the north of the

study area between the Fingland U141S local road and Auchenshinnoch Hill. Visibility in the east of the study area becomes a little patchy, localised to hilltops at White Knowe, Lochwhinnie Hill and Lochlee Hill with some minor visibility seen on low ground between. Areas of more distant visibility can be found on the western and northeastern edges of the study area.

- 6.3.10 Effects on landscape and visual receptors outside the areas of visibility shown on the ZTV study would be Negligible, None or Neutral and are not considered further.

Landscape Character

- 6.3.11 Identified landscape character types (LCT) in the study area are shown on Figure 6.3. These are based upon the Scottish National Landscape Character Assessment; Landscape Character Types Map and Descriptions, an online database published by NatureScot (2019) (the LCA). This supersedes the 1990s landscape character descriptions and mapping produced by NatureScot (formerly Scottish Natural Heritage (SNH)) and by implication, other interim LCAs produced by councils. In the words of SNH the LCTs “... *should be used for new development proposals, plans and strategies, and so on.*”
- 6.3.12 The proposed OHL route and most of the study area lies within NatureScot LCT 176 Foothills with Forest Dumfries & Galloway, with a small section in the north of the study area over 1 km from the proposed OHL route, in LCT 178 Southern Uplands with Forest Dumfries & Galloway.
- 6.3.13 LCT 176 Foothills with Forest Dumfries & Galloway has a predominantly forest landcover over undulating and gently rounded summits. The landscape is dissected by many streams which have cut incisions into the landform. Effects on LCT 176 Foothills with Forest Dumfries & Galloway are considered within Section 6.5 of this chapter, with a baseline description provided alongside the assessment of effects for ease of reference.
- 6.3.14 LCT 178 Southern Uplands with Forest Dumfries & Galloway has similar landcover to LCT 176, but the landscape is generally at a higher altitude and of a larger scale. The proposed development would only be visible from a very small area in LCT 178 Southern Uplands with Forest Dumfries & Galloway and any effects on its landscape character would be indirect and negligible, as such it is not considered further in this appraisal.

Visual Receptors

- 6.3.15 Visual receptors are “*the different groups of people who may experience views of the development*” (GLVIA, 3rd edition, para 6.3). To identify those groups who may be significantly affected, the ZTV study, a baseline desk study and site visits have been used.
- 6.3.16 The different types of groups assessed within this chapter encompass local residents; people using key routes such as roads; cycle ways, people within accessible or recreational landscapes; people using core paths and Rights of Way; or people visiting key viewpoints. In dealing with areas of settlement, local walking and cycling routes and local roads, receptors are grouped into areas where effects

might be expected to be broadly similar, or areas which share particular factors in common.

- 6.3.17 Representative viewpoints have been selected to aid the assessment of effects on visual receptors.

Visual Receptor Groups

- 6.3.18 The following visual receptor groups are located within the study area and are likely to have visibility of the proposed development, as shown by the ZTV, and are considered further in Section 6.4:

- Auchenshinnoch – Landscape and receptors in the north of the study area including the properties at Auchenshinnoch and Fingland (approximately 1 km – 1.3 km north of the proposed OHL route);
- Butterhole Bridge - Recreational users of Core Path DALR/199 between the SUW at Butterhole Bridge and the western edge of the study area (approximately 0.8 km west of the proposed OHL route); and
- Southern Upland Way - Recreational users of the SUW and Core Path UNNO/504 between Old Hill of Mackilston and Culmark Hill (approximately 0.4 km west of the of the proposed OHL route).

Key Routes

- 6.3.19 The Fingland U141S local road passes through the study area from south-west at Old Mackilston Hill, arching around the north of the proposed OHL route, parallel to the north of Black Water and exits the study area at College Glen in the north-east. The road is often parallel to the proposed OHL route and its closest point is approximately 100 m from the proposed OHL route.

- 6.3.20 There are no other public roads within the study area.

Specific Viewpoints

- 6.3.21 Specific viewpoints are locations which are identified as having a desirable view which are commonly visited for viewing purposes. These locations are marked by symbol on OS mapping. There are no specific viewpoints, as marked on OS mapping, located within the study area.

Landscape Designations and Value

- 6.3.22 There are no locally or nationally designated landscapes within the study area. The closest landscape designations are the Galloway Hills Regional Scenic Area (RSA) approximately 2.5 km to the west, and the Thornhill Uplands RSA approximately 4.8 km to the east. Due to the scale of the development, limited visibility and intervening distance, there are unlikely to be any noticeable effects from the proposed development on designated landscapes and they are not considered further.

6.4 Predicted Impacts and Mitigation

The Proposed Development

6.4.1 The following section provides an overview of the main aspects of the proposed development which might give rise to landscape and visual effects. Please refer to Chapter 4 for further detail. The proposed development is anticipated to comprise the following:

- OHL, approximately 3.7 km in length;
- 38 Intermediate H poles, between 10 and 16 m in height;
- 9 H section/Angle Deviation Poles, between 10 and 18 m in height;
- 2 Cable Termination H poles, between 12 and 13 m in height;
- 4 temporary construction compounds;
- Working areas at the base of each proposed H pole;
- Preliminary (temporary) access routes, mainly aligned to existing tracks or to connect the proposed development to existing tracks; and
- Approximately 23.09 ha of forestry felling.

6.4.2 The proposed development would have a lifespan of up to 40 years, after which all equipment would be removed from the OHL route and the land fully restored.

6.4.3 Construction and decommissioning of the proposed development would involve the following additional temporary operations which may give rise to landscape and visual effects:

- Creation/removal of temporary construction compounds for the construction/decommissioning phase (including storage and welfare facilities);
- Movement and operation of plant machinery to lift/remove equipment into place;
- Creation of access tracks for material and equipment set down;
- Installation/removal of equipment;
- Excavations and reinstatement for underground cable runs.

6.4.4 The construction of the proposed development would take approximately 10 months. Construction activities would be serviced from the temporary construction compounds and laydown areas.

6.4.5 For assessment purposes indicative locations have been shown for each of the wood poles, however during construction the poles may have to be slightly relocated to allow for localised ground conditions or landowner requirements. Similarly there is some minor flexibility for the proposed height of a wood pole structure to slightly increase if required.

Mitigation Proposals

- 6.4.6 Compensatory planting is proposed to replace the loss of coniferous forestry. At this moment in time the location of the planting is still not known and whilst discussions with landowners are ongoing the planting is likely to be off-site.

The new planting would not mitigate against the visual effects of the proposed development, but would provide for Biodiversity Net Gain (BNG) and support habitats and green networks elsewhere in Dumfries and Galloway.

- 6.4.7 Further information on compensatory planting is provided in the forestry appraisal in Chapter 10 and the BNG report in Appendix 7.6.

Predicted Landscape and Visual Effects

Introduction

- 6.4.8 This section sets out the effects that the proposed development would have on landscape and visual receptors.

- 6.4.9 Given the location of the proposed OHL route, enclosed by forestry and landform, the lack of receptors in the study area, and the temporary and short-term nature of construction and decommissioning, the construction and decommissioning effects would not give rise to any landscape and visual effects over and above those of the operational development. As such, specific construction and decommissioning effects on receptors are not individually identified unless the impact on a specific receptor would be greater than the operational effect. In this respect the actual felling process of commercial forestry along the route of the OHL is considered a short-term disruptive construction effect; whereas the creation of a corridor through the forestry along the proposed OHL route is a long-term operational effect.

Effects on Landscape Fabric of the Proposed Route

- 6.4.10 The proposed development would include the installation of a H-pole mounted OHL over a 3.7 km route. Each H-pole would require foundations at or below ground level which would require excavation, and a working area at the base of each wood pole for installation. There would be four temporary construction compounds made up across the length of the route as indicated on Figure 4.1.
- 6.4.11 Access tracks would branch off an existing forestry access track, using other existing routes where available to provide access to the proposed OHL route and working areas. Forestry felling would be required for the proposed OHL route, working areas and any new access routes required inside the forestry area. Total forestry felling may be up to 24.33 ha.
- 6.4.12 Once construction is complete, working areas and compounds would be dismantled and ground restored or replaced for the duration of the operational life of the OHL.

Viewpoint Analysis

- 6.4.13 Viewpoint analysis has been undertaken from a total of four viewpoints. The viewpoint locations are illustrated on Figures 6.1 – 6.4. The visualisation Photosheets and accompanying wirelines are presented in Appendix 6.5 Viewpoints and Wirelines.
- 6.4.14 The viewpoint analysis is contained within Appendix 6.4 Viewpoint Analysis. The findings, with respect to long-term operational effects, are summarised below in Table 6.5: Viewpoint analysis summary. In each case, distances are listed to the nearest point of the proposed OHL route.
- 6.4.15 Please note that Appendix 6.4 Viewpoint Analysis considers the nature and the scale of changes to character and views at each viewpoint location only. The sensitivity of receptors and wider extent of the effect (beyond the individual viewpoint location) and its duration are considered in the main body of the assessment text below as part of the consideration of the magnitude and significance of effects.

Table 6.5: Viewpoint Analysis Summary

Viewpoint No.	Viewpoint	Distance/ Direction	Scale of Landscape Change	Scale of Visual Change
1	Local Road Near Auchenshinnoch	0.26 km N	Small	Small
2	Local Road Beside Catherine's Pool	0.23 km NW	Small	Small
3	Southern Upland Way	0.64 km NW	Small	Small
4	Auchenshinnoch Hill	1.3 km N	Negligible	Small

- 6.4.16 Each of the viewpoints is a 'sample' of the potential effects, representing a wide range of receptors – including not only those actually at the viewpoint, but also those nearby, at a similar distance and/or direction.

Effects on Landscape Character

- 6.4.17 The character and key features of the host LCT is briefly summarised below, based on published landscape character assessments and site survey work undertaken for this appraisal; followed by a description of the predicted effects.

LCT 176 Foothills with Forest – Dumfries & Galloway

- 6.4.18 As shown on Figure 6.3, this LCT includes the proposed OHL route and most of the study area, extending beyond the study area to the east, south and west. The key characteristics of the LCT, as identified by NatureScot, which are relevant to the study area, are:

- *“Dark green blanket of forest covering undulating foothills.*
 - *Changing landscape with areas with large and medium scale forestry operations and wind farm development.*
 - *Forested areas dominated by Sitka Spruce, interspersed with mixed conifers and broadleaf planting, undergoing felling and replanting in large coupes.*
 - *Areas of more complex, locally distinctive and smaller-scale landscapes, with semi-improved pasture with walled enclosures on open ground, occasional lochs and estate policies, distinctive ridges and landmark summits”.*
- 6.4.19 The LCT and west of the study area are host to an existing OHL of similar scale and design to the proposed OHL route.
- 6.4.20 As identified within Appendix 6.3, the susceptibility of LCT 176 Foothills with Forest – Dumfries & Galloway area is judged to be Medium. The landscape within this LCT unit is judged to be of Community Value. Considering susceptibility and value together the sensitivity is judged to be Medium.
- 6.4.21 The proposed development would impact the forestry characteristics within the LCT unit in the form of forestry felling to accommodate a 60 m wide route corridor in which the proposed development would be established. Changes to the forestry would be linear and structural, which would reflect breaks in forestry at internal roads and trails, though would be considerably wider for the construction corridor. Alterations to forestry would be innocuous when considered with the general arrangement and with the rotational felling present in the area.
- 6.4.22 Additional features seen in the OHL, wood poles and terminus infrastructure would increase the spread of industrial elements to the landscape already seen in the lower voltage OHL to the north of the local road and west of Glenshimmeroch Hill. Elements of the proposed development would be partially screened by forestry in the centre of the route and would have limited influence on landscape character in these areas. The proposed development would have some increased influence over gentle rolling landforms at each end of the route when visible in open ground.
- 6.4.23 Noticeable change within the construction and decommissioning phases would occur across the proposed OHL route with temporary construction compounds located in open ground at the either end of the route and within the construction corridor. Temporary changes to landscape character would involve felling of forestry within the route corridor, the stripping and preparation of ground in working areas at the base of each wood pole and excavation for foundations and the erection of the temporary construction compounds. Disturbed land within the construction corridor and compounds would be restored to existing conditions for the duration of the operational phase and after decommissioning.
- 6.4.24 This landscape receptor has a Medium sensitivity to change from the proposed development. Operational effects would be of a Small scale across a limited area and long-term, resulting in a Slight/Negligible magnitude of change to landscape characteristics and LCT 176 Foothills with Forest – Dumfries & Galloway, resulting in an overall Minor to Negligible adverse level of effect.

Visual Effects

- 6.4.25 This assessment focuses on effects on visual receptor groups, incorporating views from public transport and recreational routes through the study area. The assessment focuses on the visual amenity of publicly accessible areas, though views from groups of dwellings will also be noted in the descriptions if relevant. Effects on private residential amenity are a separate matter, and as set out at Section 6.2.9 above do not merit a full RVAA in respect of this proposed development.
- 6.4.26 Information and detail on how visual sensitivity, magnitude of change and level of effects are assessed is provided in Appendix 6.1 Methodology.
- 6.4.27 The visual receptor groups include different categories of receptors including local residents, users of the SUW and core paths and local road users. Existing views within the study area towards the proposed OHL route are generally views across an undulating moorland landscape with large areas of coniferous forestry, which define the views. The landscape includes commonplace elements and lacks distinctiveness. Tall man-made vertical elements such as wind turbines are visible from within the study area, though are visually associated with areas external to the study area. An existing OHL of similar scale and design to the proposed OHL route is located within the west of the study area; and lower voltage OHL infrastructure which services dispersed residential properties and farms are present in the north of the study area. People would not visit or be drawn to the study area to experience any particular or highly scenic view, though recreational routes associated with such views pass through the study area. The value of views towards the proposed OHL route from all visual receptors within the study area is therefore classified as 'Community' and, due to the presence of local residents and walkers, each receptor group would have a High susceptibility to the change arising from the proposed development. As a result, all these visual receptor groups are considered to be of High/Medium sensitivity to the proposed development.

Auchenshinnoch (1 km – 1.3 km North of the Proposed OHL Route)

- 6.4.28 The receptor group includes the landscape within the north of the study area, including the two properties, Auchenshinnoch approximately 1 km to the north and Fingland approximately 1.2 km to the north of the proposed OHL route. Each property is accessed by private roads from the local road to the north of the proposed OHL route. These properties are set on a south facing hill, with aspects facing towards the proposed OHL route.
- 6.4.29 The current visual environment from this area consists of broad, open southern views over sloping pasture with no trees into large areas of forestry. There may be some partial visibility to operational wind turbines at Black Craig Hill Wind Farm on the southern horizon.
- 6.4.30 As indicated on Figure 6.2, there would be theoretical visibility from fields associated with the properties, which would experience broad views across the proposed route of the OHL, as illustrated from Viewpoint 4.

- 6.4.31 There would also be some visibility from the dwelling at Auchenshinnoch, which has windows facing toward the proposed OHL route and an open garden frontage to the south of the dwelling. Impacts would be limited at this distance, and views may also be partially screened by garden trees. Views would also be possible when travelling south toward the proposed OHL route from the private access road. Views to the proposed OHL route would be marginal from Fingland, with very limited theoretical visibility indicated on the ZTV due to intervening landform, which would be further screened by woodland to the south of the dwelling. Some minor lateral views would be available from the private access road.
- 6.4.32 A number of the wood poles forming the OHL would be visible in the middle distance, often partially screened and/or backclothed by forestry and would appear to be integrated with the landscape. Marginally increased effects may be experienced from the fields to the north of the properties, as noted in the Viewpoint 4 analysis, where the full extent of the OHL route would be visible.
- 6.4.33 Construction and decommissioning effects would be discernible from this receptor, including changes to ground conditions, excavation and the erection of temporary compounds external to the forestry and felling within the construction corridor. Effects experienced due to temporary changes to ground condition would be limited due to intervening distance, with ground conditions restored to existing after construction and decommissioning.
- 6.4.34 In summary, the majority of the OHL would be backclothed by landform and/or forestry and from this distance the OHL would not dominate the view or alter perceptions of the landscape and visual amenity of the area.
- 6.4.35 For this receptor group operational effects would be of a Small scale across a limited extent and long-term, resulting in a Slight/Negligible magnitude of change, resulting in an overall Minor adverse level of effect.

Butterhole Bridge (Landscape within the West of the Study Area, Generally Over 0.8 km West of the Proposed OHL Route)

- 6.4.36 This receptor consists of a core path which is aligned to an access track leading to Marskaig, which is outside the study area. The route has a south-east to north-west alignment, beginning at Butterhole Bridge on the local road to the north of the proposed OHL route. The route connects to the SUW at Butterhole Bridge.
- 6.4.37 The current visual environment from this receptor consists of channelled views along the core path which is aligned to a small watercourse. Views to the north-west are into open pasture which slopes away to reveal a distant upland horizon. Views to the south-east are toward the proposed OHL route, with mature, felled and restocked forestry visible on rolling hills. As indicated on Figure 6.2, and confirmed during a site survey, there would be limited visibility of the proposed OHL route from the core path, with landform beside the core path largely screening views to the east and north. Views to the western end of the proposed OHL route would be available from the core path when travelling toward Butterhole Bridge and the SUW in which Poles 1-8 may be visible in front of Glenshimmeroch Hill. The proposed OHL route would appear in view with the existing OHL from this receptor

and would increase the amount of infrastructure features in this view; however they would not create a wirescape or become the dominant feature in view.

- 6.4.38 Construction and decommissioning effects would be limited for this receptor, with much of the proposed OHL route screened by landform. The temporary construction compound at the western end of the OHL may be visible though changes to ground conditions in working areas would be barely discernible from this receptor, which has limited visibility to the proposed OHL route.
- 6.4.39 For this receptor group operational effects would be of a Small/Negligible scale across a limited extent and long-term, resulting in a Negligible magnitude of change, resulting in an overall Negligible adverse level of effect.

Southern Upland Way (0.4 km West of the Proposed OHL Route)

- 6.4.40 This receptor group is focused on the landscape around, and walkers on, the SUW between Butterhole Bridge and Culmark Hill. This 347 km-long distance trail connects the east and west coasts of southern Scotland, passing through various landscapes within Dumfries and Galloway and the Scottish Borders. The SUW passes through the study area from the south at Old Hill of Mackilston.
- 6.4.41 The current visual environment from this receptor consists of elevated views to the south over sloping pasture to mature, felled and restocked commercial forestry surrounding the proposed OHL route. An existing wood pole OHL is visible below the viewpoint in the foreground grassland, and is backclothed by forestry on the south of the local road. Long range views are available to distant upland to the west, with smooth undulating pasture seen in the east, along with operational turbines at Wether Hill Wind Farm.
- 6.4.42 As indicated on Figure 6.2, the main area of visibility along this route would occur between the point which the path branches north from the local road and Marskaig Hill, with some more distant visibility further north on the trail towards Culmark Hill. The photowireline from Viewpoint 3 illustrates visibility of the proposed OHL from this section of the path, the location of which was selected during a site survey as having the most open views possible of the proposed OHL from the SUW. Views of the proposed development would occur for walkers travelling southbound on this section of the route, as illustrated at Viewpoint 3. From here, the proposed development would be visible on an adjacent, facing hillslope, above and behind the existing OHL below the viewpoint. Forestry would screen the middle section of the proposed OHL route, though the wood poles and other infrastructure at the western end of the proposed OHL route would be visible on open ground on the northern slope of Craigencorr Hill. More distant visibility to the eastern end of the array would be possible in lateral views off the trail, with the proposed OHL route appearing traceable through forestry between open areas.
- 6.4.43 For this receptor group, operational effects would be of a Small scale across a limited extent and long-term, resulting in a Slight magnitude of change, resulting in an overall Moderate to Minor adverse level of effect, for a length of approximately 600 m of the SUW.

Key Routes

Fingland U141S Public Local Road (0.1 km – 1.3 km from the Proposed OHL Route)

- 6.4.44 This 21 km local road consists of a single lane road with passing places that connects the A702 to the B792 over elevated, mosaic grassland and forestry, passing Lochinvar and sharing a section of the route with the SUW.
- 6.4.45 Local road users are considered to have a Medium susceptibility and Medium to Low sensitivity to developments of this nature (see Appendix 6.1 for further information).
- 6.4.46 The current visual environment from this receptor consists of sequential and changing views along a winding route that follows the Black Water. Visibility is generally channelled along the edge of the forestry along the proposed OHL route, with undulating pasture seen to the north and east, dropping away in the west to reveal brief views to distant uplands. An existing wood pole OHL is visible to the north of the road between Auchenshinnoch and Black Rig and is aligned parallel to the road.
- 6.4.47 Users of the road would experience visibility of the proposed OHL route over an approximate 2 km stretch between White Knowe and Black Rig. Visibility would be consistent over this stretch, where the proposed OHL route runs close to parallel with the road. Views would be most pronounced in areas between the property entrance to Auchenshinnoch and a cattle grid to the west, where the proposed OHL route would be clearly visible off the southern side of the road in open ground, as illustrated from Viewpoint 1. The OHL route would at times appear above the direction of travel for both east and westbound traffic.
- 6.4.48 The proposed OHL route would be located in forestry from the cattle grid to the west, and would be partially screened in views from the road, though felling within the route corridor would be visible, as well as potential partial views to the tops of the wood poles within the felled corridor. The proposed OHL route may be visible above the direction of travel for both east and westbound traffic along this section of the road, with views at time aligned with the proposed OHL route, resulting in potential stacking of wood poles, as noted in the Viewpoint 2 analysis, beside Catherines Pool. On the section of the route to the east of Auchenshinnoch, and to the south-west of the Butterhole Bridge, visibility to the proposed development would be screened by landform.
- 6.4.49 There would be some close range views of the proposed OHL route from this road, however there would be no change to key views which are focused to the west across grassland to distinct upland features. The scale of the wood poles means that the OHL would not dominate the view or alter perceptions of the landscape and visual amenity of the area for local road users.
- 6.4.50 For this receptor group operational effects would be of a Small scale across a limited extent and long-term, resulting in a Slight magnitude of change, resulting in an overall Minor adverse level of effect, for a very short section of the road.

6.5 Summary

- 6.5.1 Overall, the proposed OHL would have small scale and minor adverse effects on the local landscape character and on a very small number of visual receptors. It is not considered the proposed OHL would materially change the landscape character or visual amenity of the local area, and a landscape of this scale can accommodate an OHL of this nature without fundamentally impacting the character of the landscape.
- 6.5.2 There would be a loss of landscape elements to create the route corridor when it runs through the existing commercial forestry, however, this is forestry that would be felled at some point in the future regardless of the development of the proposed OHL.
- 6.5.3 A summary of the identified impacts on landscape and visual amenity is provided in Table 6.6 below.

Table 6.6: Summary of Impacts

Receptor	Potential Impact	Mitigation	Residual Effect
LCT176 Foothills with Forest – Dumfries & Galloway	Change in landscape character and loss of landscape elements	None	Minor to negligible adverse
Auchenshinnoch	Impacts on visual amenity for residents	None	Minor adverse
Butterhole Bridge	Impacts on visual amenity for walkers	None	Negligible adverse
Southern Upland Way	Impacts on visual amenity for walkers	None	Moderate to minor adverse
Fingland UI41S Public Local Road	Impacts on visual amenity for road users	None	Minor adverse

6.6 References

Landscape Institute and the IEMA, (2013), Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA 3).

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07.

**Ecology and
Ornithology
Appraisal**

7 Ecology and Ornithology Appraisal

7.1 Introduction

7.1.1 This chapter sets out the proposed scope and approach to assessing potential direct and indirect impacts of the proposed development on ecological and ornithological receptors during construction, operation and decommissioning phases. Within this chapter, the methodology for surveys will be presented and potential effects that may arise as a result of the proposed development will be outlined, as well as proposed mitigation measures.

7.1.2 This chapter is supported by the following figures and appendices:

- Figure 7.1: NVC Habitat Survey;
- Figure 7.2: Groundwater Dependent Terrestrial Ecosystems;
- Appendix 7.1: NVC Survey Report;
- Appendix 7.2: Protected Species Survey Report;
- Appendix 7.3: Ornithology Vantage Point Survey Report;
- Appendix 7.4: Breeding Bird and Raptor Survey Report;
- Appendix 7.5: Black Grouse Survey;
- Appendix 7.6: Biodiversity Net Gain Report.

7.2 Methodology

Consultation

7.2.1 NatureScot was approached in October 2021 to comment on the proposed survey programme. NatureScot responded that it does not consider that the effects of the proposal will raise natural heritage issues of national interest, and therefore did not provide specific advice, instead referring to its general guidance on ecological assessments for overhead line developments.

7.2.2 Consultation with NatureScot was undertaken by email with regard to the black grouse (*Lyrurus tetrix*) survey strategy in May 2022. NatureScot responded that it is unlikely that NatureScot would object if consulted on the potential impacts of the proposed development on black grouse, as it would not constitute an issue of

national interest. They also referred to their ‘standing advice’⁵ on mitigation for black grouse.

- 7.2.3 NatureScot was consulted again in October 2022 as part of the consultation on the overhead line (OHL) routeing options. NatureScot referred back to their previous advice on black grouse and their ‘standing advice’.

Scope of the Assessment

- 7.2.4 The assessment in this chapter takes account of any likely significant effects on protected species and habitats present along the proposed OHL route and within the study areas for ecology and ornithology. Data used in the assessment is taken from a desk-based assessment and detailed ecological and ornithological surveys of the works areas.
- 7.2.5 Consideration has been given to the habitats and species which characterise the proposed OHL route and the potential for connectivity with sites subject to a nature conservation designation such as special areas of conservation (SAC), special protection areas (SPAs) and sites of special scientific interest (SSSI). The ‘study area’ is defined as the footprint of the proposed infrastructure and enabling works, in addition to buffers of varying distances dependent on the species considered.

Methodology

- 7.2.6 A number of data reviews and site surveys were carried out between 2021 and 2023. The methods and timings of these surveys are described below.

Desk Study

- 7.2.7 A desk based study was carried out in October 2021 for reference materials relating to the ecology of the route options study area (since revised to the proposed OHL route) from the following sources:
- Southwest Scotland Environmental Information Centre;
 - Royal Society for the Protection of Birds (RSPB);
 - British Trust for Ornithology (BTO);
 - NatureScot SiteLink website; and
 - Joint Nature Conservation Committee (JNCC) website.
- 7.2.8 A search was made in 2023 for information on statutory designated sites (often internationally and nationally important sites for ecology) within 2 km of the proposed OHL route and non-statutory designated sites (often important in a local context) within 1 km. The search was extended to 10 km for internationally

⁵ NatureScot, (2023), Planning and development: standing advice and guidance documents. Available from: <https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-standing-advice-and-guidance-documents>

designated sites. A search was also made for records of noteworthy species within 2 km of the proposed OHL route. Species included in the search parameters were:

- European protected species (listed on Schedule 2 and 4 of the Conservation (Natural Habitats, & c.) Regulations 1994 (as amended));
- nationally protected species under Schedules 1, 5 and 8 of The Wildlife & Countryside Act 1981 as amended by The Wildlife and Natural Environment (Scotland) Act 2011 and The Protection of Badgers Act 1992;
- species listed as critically endangered, endangered, or vulnerable on the International Union for Conservation of Nature (IUCN) Red List;
- nationally rare or nationally scarce species;
- notable invertebrates; and
- species that have action plans under the Scottish Biodiversity List (SBL) or are priority species under the Local Biodiversity Action Plan (LBAP).

7.2.9 Ecology reports relating to nearby developments were also reviewed as part of the desk study (EDF Renewables, 2019, EnergieKontor, 2020).

Ecology

7.2.10 A series of ecology surveys were carried out on the study area in 2023. This included a habitat survey comprising a UK Habitats and National Vegetation Classification (NVC) survey, carried out in October and November 2023. This survey encompassed a study area of the development footprint and a 250 m buffer around it. The aim of this survey was to identify and map the extent of the vegetation communities present within the 250 m study area to identify habitats with high ecological value. The survey followed guidance from the JNCC (Rodwell, 2006). Further details of the survey methodology are provided in Appendix 7.1.

7.2.11 A protected species survey was also carried out in October and November 2023. This survey encompassed a study area of the development footprint and buffer zones of 30 m for bats and badgers (*Meles meles*), 50 m for red squirrel (*Sciurus vulgaris*), and 200 m for water vole (*Arvicola amphibius*) and otter (*Lutra lutra*). The aim of this survey was to identify any suitable habitats and signs of protected animal species, following up-to-date guidance for protected species surveys.; Further information on the survey is provided in Appendix 7.2.

7.2.12 The UK Habitats survey included a condition assessment of the habitats present in order undertake a biodiversity net gain (BNG) calculation for the proposed development. The assessment will be an iterative process to determine the level of enhancements required to ensure biodiversity is fully considered as part of the proposed development, in line with the National Planning Framework 4, Policy 3 (Scottish Government, 2023).

7.2.13 NatureScot's guidance document 'Advising on peatland, carbon-rich soils and priority peatland habitats in development management' (2023) was also taken into consideration.

Ornithology

- 7.2.14 A programme of ornithology surveys was carried out between 2021 and 2022, following guidance from NatureScot for the assessment of impacts of power lines on birds (2016).
- 7.2.15 Vantage point surveys were conducted at three locations along the proposed OHL route. Seventy-two hours of survey were carried out over the course of one year from 2021 to 2022, in the form of two, three-hour watches per month. Survey methods followed guidance from NatureScot (2017). Further information is available in Appendix 7.3.
- 7.2.16 Breeding and wintering walkover surveys were conducted in 2021 and 2022 following guidance from Gilbert et al. (1998). These included targeted surveys for breeding raptors within 1 km of the proposed OHL route. Further information on the methodology is provided in Appendix 7.4.
- 7.2.17 The background data search identified two historic black grouse leks in close proximity to the proposed OHL route, and so targeted surveys for black grouse were carried out in 2022. These surveys followed methods as described in Gilbert et al. (1998). Further information is provided in Appendix 7.5.

7.3 Existing Environment

- 7.3.1 The proposed OHL route largely comprises coniferous plantation, clear fell forestry, modified grazed grassland, bog and heathland, with the Black Water river and its tributaries also running through the proposed OHL route at various sections.
- 7.3.2 The surrounding area to the east and south of the proposed OHL route also consists of coniferous plantation and clear fell forestry. Areas to the north and west are of a similar kind to the bog, heathland and modified grassland habitats used for grazing livestock, as present within the study area. Lochinvar lies to the south-east.

Designated Sites

- 7.3.3 The Loch Ken and River Dee Marshes Special Protected Area (SPA) and Ramsar site is located 8.39 km from the proposed OHL route. This site is designated for its populations of Greenland white-fronted goose (*Anser albifrons*) and greylag goose (*Anser anser*). These species were not observed during the ornithology surveys and the habitats on site are not considered suitable for these species. There is also no direct hydrological link from the proposed development to the SPA and Ramsar site. Therefore, this designated site is not considered further in this appraisal.
- 7.3.4 There are no statutory designated national or local designated sites within 2 km and no non-statutory sites within 1 km of the proposed OHL route.

Habitats

- 7.3.5 Nine NVC communities were identified during the survey, these are shown in Figure 7.1. The most prevalent NVC community across the proposed OHL route is M25 *Molinia caerulea* - *Potentilla erecta* mire. The remaining areas consist of wet heath, mires, rush pastures, and agriculturally modified acid grassland. The centre of the

proposed OHL route is almost entirely a complex mosaic of acid grassland and Molinia rush pasture, probably derived from historically drained bog habitat. The differences between the communities are apparently almost entirely due to variation in management, mainly the frequency of cutting or grazing.

- 7.3.6 Of the grassland and moorland habitats identified at the proposed OHL route, M15, M18 and M23 communities fall into the UK Biodiversity Action Plan (BAP) Priority Habitat Bogs: Blanket Bog; M25 *Molinia- Potentilla* is listed under Fen, Marsh and Swamp: Purple Moor Grass and Rush Pastures. These are also listed on the SBL, as well as U5 *Nardus- Galium* grassland and U6 *Juncus - Festuca* grassland, which were all present within the study area.
- 7.3.7 Blanket bog, purple moor grass, acid and neutral grasslands, and upland heath habitats are additionally listed as Priority Habitats in the Dumfries and Galloway Local Biodiversity Action Plan (the Dumfries and Galloway Biodiversity Partnership, 2009), with priority actions to manage, restore and expand such habitats.
- 7.3.8 While these habitats have been classified as having priority status, given their current management regime of heavy grazing and historic drainage, they appear to be in a degraded condition. Species identified were all common and widespread, thus these habitats could only be considered to have local importance.

Groundwater Dependent Terrestrial Ecosystems

- 7.3.9 Vegetation communities along the proposed OHL route and the 250 m NVC study area have the potential to be groundwater dependent terrestrial ecosystems (GWDTE). These habitats and their GWDTE potential are listed in Table 7.1 and mapped in Figure 7.2.

Table 7.1: Vegetation Communities within the Study Area which may be GWDTE (SEPA, 2017)

NVC Code	NVC Community Name	Potential GWDTE Status
M15	<i>Trichophorum germanicum - Erica tetralix</i> wet heath	Moderate
M23	<i>Juncus effusus/acutiflorus - Galium palustre</i> rush - pasture	High
M25	<i>Molinia caerulea - Potentilla erecta</i> mire	Moderate
MG9	<i>Holcus lanatus - Deschampsia cespitosa</i> grassland	Moderate
U6	<i>Juncus squarrosus - Festuca ovina</i> grassland	Moderate

Protected Species

- 7.3.10 Suitable habitat for reptiles and amphibians is present within the 250 m study area including potential hibernacula such as dead wood and drystone walls, terrestrial habitat such as rough grassland and woodland, and aquatic habitat in the form of a small pond. No evidence of reptiles or amphibians was identified during the

surveys; however it is considered likely that common amphibian and reptile species are present.

- 7.3.11 During the preliminary ground-level roost assessment of trees, no trees were identified as being suitable for supporting roosting bats, as such, the risk of presence of roosting bats in trees along the proposed OHL route is considered negligible. Plantation woodland generally offers low suitability for bats, other areas on the route mainly consisted of open heathland with very few isolated or young trees. No potential roost features (PRFs) were recorded.
- 7.3.12 The preliminary roost assessment recorded two structures with potential roost features for bats within the 250 m study area. Both structures were assessed as having low roosting suitability due to the condition of the structures, the lack of shelter and unsuitable surrounding landscape. As these structures would not be affected by the proposed development, bats are not considered further in this appraisal.
- 7.3.13 The more mature area of coniferous plantation to the west of the centre of the proposed OHL route was recorded as having some suitable habitat for red squirrel, however no evidence of this species was recorded during the time of survey.
- 7.3.14 Some areas of suitable habitat for water vole were noted across the study area, however most watercourses were overgrown and moderately poached with livestock present. No evidence of water vole was recorded during, though some signs of field vole (*Microtus agrestis*) were found.
- 7.3.15 The Black Water river was recorded as having high suitability for otter. Spraints were found, as well as mammal trails, though no holts were identified along the river at the time of the survey. It is therefore considered that this stretch of the river is used by otter for commuting and foraging.
- 7.3.16 Habitats to the east and south of the proposed OHL route offer the most suitable habitat for badger, with opportunities for sett building and foraging within the areas of plantation woodland. An active sett was identified during a walkover survey to inform to routeing consultation, located more than 100 m to the south of the finalised OHL route. The ground within 30 m of the proposed development footprint is wet and boggy, reducing the suitability for badger. No evidence of badger was found at the time of the 2023 protected species survey.

Ornithology

- 7.3.17 Suitable habitat for black grouse was restricted within the proposed OHL route, however the desk study identified two historic black grouse leks within 500 m of the proposed OHL route. Surveys were undertaken in 2022 at the two locations previously used by lekking birds. No evidence of black grouse was recorded during these surveys, and it is considered that the proposed OHL route does not currently support a black grouse population (see Appendix 7.5).
- 7.3.18 The breeding and wintering bird surveys undertaken in 2022 recorded a total of 71 bird species, 45 of which were confirmed or probably breeding in close proximity to the proposed OHL route. Based on the species recorded, the breeding bird

assemblage on site is assessed as being of up to district importance. Regarding individual species, breeding populations of skylark (*Alauda arvensis*) and meadow pipit (*Anthus pratensis*) recorded on site are assessed as being of up to district importance, while goshawk (*Accipiter gentilis*) is considered to be of local importance (see Appendix 7.4).

- 7.3.19 The vantage point surveys in 2021-2022 recorded flights at potential collision risk height through the proposed OHL route from several target species, namely goshawk (*Accipiter gentilis*), short-eared owl (*Asio flammeus*), hen harrier (*Circus cyaneus*), peregrine (*Falco peregrinus*), red kite (*Milvus milvus*) and woodcock (*Scolopax rusticola*). These flights were concentrated in the area between Lochwhinnie Hill and Lochlee Hill, and south of Glenshimmeroch Hill (see Appendix 7.3). Goshawk, hen harrier and red kite are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), and short-eared owl is an amber-listed Bird of Conservation Concern (Stanbury et al., 2021).

7.4 Predicted Impacts and Mitigation

Construction Impacts

Habitats

- 7.4.1 The construction of the proposed development would lead to loss of areas of priority habitats, namely M25: Fen, Marsh and Swamp: Purple Moor Grass and Rush Pastures; and M23 and M15: Blanket Bog. These effects would be both temporary (for construction compounds, access tracks and the underground cable) and permanent (around the OHL wood poles). The areas permanently lost would be small, and the current condition of the habitats is poor; therefore the potential effect of the proposed development on habitats is considered to be minor.
- 7.4.2 Where possible, temporary construction compounds and access tracks would be placed to avoid areas of priority habitats. Following construction, these compounds and access tracks would be removed, and the habitat reinstated and enhanced.
- 7.4.3 To compensate for the loss of priority habitats around the permanent OHL infrastructure, and to achieve a net gain for biodiversity, it is proposed that habitat creation be carried out both on site and off site. The areas of forestry felled for the wayleave corridor would be used to create upland acid grassland habitat. Off-site offset planting would consist of native pine woodland and native broadleaf woodland.

Protected Species

- 7.4.4 Common reptiles and amphibians are considered likely to be within the proposed OHL route and are therefore at risk of being killed as a result of construction works.
- 7.4.5 A precautionary approach would be taken with regard to amphibians and reptiles, and works would take place under a method statement written by a suitably qualified ecologist. The drystone walls would be avoided during works between October and March to avoid potential disturbance during the hibernation period.

- 7.4.6 Clearance of trees to enable construction works has the potential to adversely affect red squirrel through loss of habitat, disturbance, or loss of breeding dreys as a result of construction activities.
- 7.4.7 Pre-construction surveys for red squirrel would be carried out immediately prior to the commencement of any tree felling or vegetation clearance works within the forestry areas. Should any dreys be identified, works would not go ahead until further surveys have been carried out to characterise the drey and a licence approved by NatureScot if necessary.
- 7.4.8 Compensatory tree planting would take many years to become suitable for the species, however there is extensive woodland in the local area, such that there would still be abundant habitat for red squirrel following tree felling, therefore the potential effect of habitat loss is considered to be minor.
- 7.4.9 The proposed development has the potential to adversely affect otter through disturbance during the construction phase. A pre-construction survey for otter would be conducted no longer than three months prior to any works within 200 m of a watercourse to identify any newly-occupied holts, and works would not take place between dusk and dawn within 100 m of a watercourse. Should any holts be identified, monitoring using camera traps and a licence from NatureScot would be necessary to facilitate the works.
- 7.4.10 Badgers are a highly mobile species and as they are known to be present in the local area, the proposed development has the potential to adversely affect badger through disturbance or destruction of setts. A pre-construction survey for badger would be conducted no longer than three months prior to the start of construction to identify any badger activity. If new setts are found that are at risk of disturbance or destruction, works would not go ahead within 30 m of any setts until a licence has been obtained from NatureScot. Alternatively, wood pole locations may be micro-sited to avoid placement within 30 m of any badger setts.

Birds

- 7.4.11 The construction phase of the proposed development has the potential to adversely affect birds within and adjacent to the proposed OHL route through collision risk, displacement, disturbance of breeding birds and their young, and the loss or alteration of suitable habitat.
- 7.4.12 Pre-construction works such as tree felling and vegetation clearance would be reduced and undertaken outside the core bird nesting season (March to August inclusive) where possible. If these works are scheduled to take place during the core bird nesting season, a pre-works inspection of vegetation to be cleared for nesting birds would be undertaken by an ornithologist no more than 24 hours prior to works commencing. If any nesting birds are identified during the survey, the vegetation would be left until the young birds have successfully fledged (or breeding has failed).
- 7.4.13 If possible, construction works would be programmed outside of the bird breeding season (which lasts from March to August inclusive) to avoid disturbance to

breeding birds. If this is not possible, a pre-construction breeding bird survey would take place to inform how disturbance can be avoided. If nesting birds are identified during the survey, work in the affected area would be rescheduled until after the young birds have successfully fledged (or breeding has failed), or an exclusion zone around the nest would be implemented to avoid disturbance.

- 7.4.14 A Bird Species Protection Plan would be prepared by a suitably qualified ornithologist to describe mitigation measures that will enable the works to go ahead while safeguarding the protected species.
- 7.4.15 Further details on proposed mitigation measures is provided in Appendices 7.2 to 7.6.

Operation Impacts

Birds

- 7.4.16 The proposed development has the potential to adversely affect birds during the operational phase through collision risk.
- 7.4.17 Installing line markers on earth wires and/or conductors as appropriate is proposed to reduce collision risk, as recommended by NatureScot (2016). These would be installed immediately upon installation of the wires to reduce the risk of collision during construction and during decommissioning removed simultaneously with the wires to reduce the risk of collision during the decommissioning phase.

Decommissioning Impacts

Habitats

- 7.4.18 Similar to the construction phase, the decommissioning phase may result in damage to or loss of priority habitats. Where possible, temporary construction compounds and access tracks would be placed to avoid areas of priority habitats. Following decommissioning, these would be removed and the habitat reinstated and enhanced.

Protected Species

- 7.4.19 Common reptiles and amphibians are considered likely to be along the proposed OHL route and are therefore at risk of being killed as a result of decommissioning works. A precautionary approach would be taken with regard to amphibians and reptiles, and works would take place under a method statement written by a suitably qualified ecologist.
- 7.4.20 The proposed development has the potential to adversely affect otter through disturbance during the decommissioning phase. A survey for otter would be conducted no longer than 3 months prior to any works within 200 m of a watercourse to identify any newly-occupied holts, and works would not take place between dusk and dawn within 100 m of a watercourse. Should any holts be identified, monitoring using camera traps and a licence from NatureScot would be necessary to facilitate the works.

7.4.21 The proposed development has the potential to adversely affect badger through disturbance or destruction of setts during the decommissioning phase. A pre-decommissioning survey for badger would be conducted no longer than three months prior to the start of decommissioning to identify any badger activity. If new setts are found that are at risk of disturbance or destruction, works would not go ahead within 30 m of any setts until a licence has been obtained from NatureScot.

Birds

7.4.22 The decommissioning phase of the proposed development has the potential to adversely affect birds within and adjacent to the proposed OHL route through displacement, and disturbance of breeding birds and their young.

7.4.23 If possible, decommissioning works would be programmed outside of the bird breeding season to avoid disturbance to breeding birds. If this is not possible a pre-decommissioning breeding bird survey would take place to inform how disturbance can be avoided. If nesting birds are identified during the survey, work in the affected area would be rescheduled until after the young birds have successfully fledged (or breeding has failed), or an exclusion zone around the nest would be implemented to avoid disturbance.

7.4.24 The Bird Species Protection Plan developed prior to construction would also cover mitigation required during the decommissioning phase.

7.5 Summary

7.5.1 The potential effects of the proposed development on ecology and ornithology have been considered and assessed. With the inclusion of the proposed mitigation measures, the effects of the proposed development are anticipated to be minor or negligible. A summary of the potential impacts is provided in Table 7.2.

Table 7.2: Summary of Impacts

Receptor	Potential Impact	Mitigation	Residual Effect
Priority habitats	Temporary loss	All temporary access tracks and construction compounds used during construction and decommissioning to be removed and habitat reinstated.	None
	Permanent loss	Compensatory planting and habitat restoration to be carried out.	Minor adverse effect on priority habitats
Reptiles and amphibians	Risk of death from construction activities	Precautionary approach taken, with works taking place under a method statement for amphibians and reptiles	Negligible adverse effect
Red squirrel	Loss of habitat	Compensatory tree planting	Minor adverse effect
	Loss or disturbance to breeding dreys	Pre-construction survey to be carried out for red squirrel.	Negligible adverse effect

Receptor	Potential Impact	Mitigation	Residual Effect
Otter	Disturbance	Pre-construction survey to be carried out for otter. No works to take place within 100 m of Black Water between dusk and dawn.	None
Badger	Disturbance or destruction of setts	Pre-construction survey to be carried out for badger.	None
Birds	Collision risk	Install line markers in key areas of bird activity	Minor adverse effect
	Habitat loss/displacement	Compensatory habitat enhancement	Minor adverse effect
	Disturbance or destruction of nests	If works are to take place within the bird breeding season, nesting bird checks would take place to identify and protect active nests.	None

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08.

**Archaeology
and Cultural
Heritage
Appraisal**

8 Archaeology and Cultural Heritage Appraisal

8.1 Introduction

- 8.1.1 The aim of this chapter, in relation the proposed 132 kV overhead line (OHL) grid connection ('the proposed development') between the Troston Windfarm Point of Connection and Glenshimmeroch Collector Substation over a distance of approximately 3.7 km (Figure 8.1), is to assess its likely impact on physical remains and setting of the historic environment (archaeology and cultural heritage).
- 8.1.2 The likely impact of the proposed development assessed in this chapter is based on a detailed consideration of the baseline of the Inner Study Area (ISA) presented in Technical Appendix 8.1 (Cultural Heritage Desk Based Assessment and Stage 1 Setting Assessment). The desk-based assessment (DBA) provides information to support an application for consent under Section 37 of the Electricity Act 1989 and deemed consent under section 57(2) of the Town and Country Planning (Scotland) Act 1997, as amended, for the OHL section of the proposed development.
- 8.1.3 This assessment is suitable for submission in support of a Section 37 application, and identifies potential heritage constraints for the proposed development in accordance with Policy 7 of the National Planning Framework 4 (NPF4) (Scottish Government, 2023), and is consistent with the requirements of national and local planning policies with respect to consideration of the historic environment in the planning process.
- 8.1.4 The Chartered Institute for Archaeologist's (CIfA's) Standard and Guidance for Historic Environment Desk-Based Assessment (2021) defines a DBA as "*...a programme of study of the historic environment within a specified area or site on land, the inter-tidal zone or underwater that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the Study Area, including appropriate consideration of the settings of heritage assets and, in England, the nature, extent and quality of the known or potential archaeological, historic, architectural and artistic interest. Significance is to be judged in a local, regional, national or international context as appropriate.*"
- 8.1.5 A DBA has determined, as far as is reasonably possible from existing records, the nature, extent and significance of the historic environment within the ISA, and the impact of the proposed development on the significance of the historic environment.
- 8.1.6 This chapter describes and assesses the significance of known heritage assets and potential archaeological remains within the ISA and provides an assessment of the likely impact of the proposed development on the significance of heritage assets,

and the contribution made by their setting, in order to identify potential historic environment planning constraints.

8.1.7 The objectives are therefore to:

- Describe the cultural significance, importance, location, nature and extent of any known heritage assets or areas of archaeological potential which may be affected by the proposed development;
- Determine any adverse effects of the proposed development upon cultural heritage;
- Outline suitable mitigation measures to avoid, reduce or offset adverse effects; and
- Provide an assessment of any residual effects remaining after mitigation.

8.2 Methodology

Legislation, Policy and Guidance

8.2.1 The assessment has been undertaken with reference to relevant legislation, policy and guidance relating to the historic environment, the context of which is presented in Appendix 8.1: Archaeological Desk-based Assessment (Section 2), including:

- Statutory Protection:
 - The Ancient Monuments and Archaeological Areas Act 1979.
 - The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.
 - The Historic Environment Scotland Act 2014.
 - Section 37 of the Electricity Act 1989
 - Schedule 9 of the Electricity Act 1989.
- National Planning Policy:
 - ‘National Planning Framework 4’ (NPF4) (Scottish Government, 2023).
 - ‘Historic Environment Policy for Scotland (HEPS)’ (Historic Environment Scotland, 2021).
- Local Planning Policy:
 - The relevant policies related to heritage protection for Dumfries and Galloway can be found in Policy HE3: Archaeology in Dumfries and Galloway’s adopted ‘Local Development Plan 2’ (Dumfries and Galloway Council, 2019).
- Guidance:
 - ‘Environmental Impact Assessment Handbook’ (NatureScot and Historic Environment Scotland (HES), 2018).
 - ‘Managing Change in the Historic Environment’ (MCHE) (HES, 2020).

- Designation Policy and Selection Guidance (DPSG) (HES, 2019) to accompany HEPS.
- Planning Advice Note (PAN) 2/2011.
- 'Code of Conduct' (Chartered Institute for Archaeologists, 2022).
- 'Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment' (CIfA, 2020).
- 'Standard and guidance for historic environment desk-based assessment' (CIfA, 2020).
- 'Principles of Cultural Heritage Impact Assessment in the UK (IEMA, IHBC and CIfA, 2021).

Consultation

- 8.2.2 Historic Environment Scotland (HES) was consulted with regard to the routing of the proposed OHL line in late 2022 (HES Case ID: 300061158). HES responded in November 2022 confirming their preferred route option as Route Option A as that option best avoided impacts to designated and non-designated heritage assets. Route Option A is the “proposed route” that comprises the proposed development.
- 8.2.3 The Planning Authority (PA) Archaeologist for Dumfries and Galloway was initially consulted in May 2023 (Email dated 29 May 2023) as part of the EIA screening opinion consultation. The PA archaeologist identified that the proposed 132 kV OHL passed close to a recorded non-designated heritage asset (MDG16021) identified as a Hay Ree, and recommended that micro-siting of the poles is used to avoid direct impacts to that feature.
- 8.2.4 The PA Archaeologist for Dumfries and Galloway was consulted again on the 11 August 2023. The PA answered the same day stating that they saw no issues with the proposed OHL route or specific locations of individual wood poles. The PA archaeologist also confirmed that there were no designated heritage assets within the 1 km Outer Study Area (OSA) and so had no concerns regarding potential impacts to the setting and significance from the proposed development.

Scope of the Assessment

- 8.2.5 This chapter assesses the proposed OHL route between the Troston Wind Farm Point of Connection and Glenshimmeroch Collector Substation in relation to its likely impact on the physical remains and setting of cultural heritage. The assessment aims to identify all known heritage assets potentially affected by the proposed development, and the potential for currently unknown heritage assets.
- 8.2.6 The ISA corresponds with a 200 m wide corridor along the proposed OHL route (see Figure 8.2) and has been used to gather baseline data on the known and potential archaeological resource of the proposed OHL route.
- 8.2.7 An OSA has been used for the Stage 1 Setting Assessment which has extended to 1 km from the proposed OHL route (see Figure 8.1). Within this study area all heritage assets within 1 km of the proposed OHL route have been identified (both to

further inform the assessment of archaeological potential for the ISA and to identify assets with potential for changes in their setting).

Methodology

Terminology – ‘Significance’ and ‘Importance’

- 8.2.8 Cultural heritage impact assessment is concerned with effects on cultural significance, which is a quality that applies to all heritage assets, and as defined by HES (Environmental Impact Assessment Handbook, NatureScot and HES 2018, v5 Appendix 1 page 175), relates to the ways in which a heritage asset is valued both by specialists and the public. The cultural significance of a heritage asset will derive from factors including the asset’s fabric, setting, context and associations. This use of the word ‘significance’, referring to the range of values attached to an asset, should not be confused with the unrelated usage where the significance of an effect reflects the weight that should be attached to it in a planning decision.
- 8.2.9 Cultural significance is assessed in relation to the criteria in DPSG Annexes 1-6, which are intended primarily to inform decisions regarding heritage designations but may also be applied more generally in identifying the ‘special characteristics’ of a heritage asset, which contribute to its significance and should be protected, conserved and enhanced according to the NPF4 Historic Assets and Places Policy 7. DPSG Annex 1 is widely applicable in assessing the cultural significance of archaeological sites and monuments, for instance, while the criteria in Annex 2 can be used in defining the architectural or historic interest of buildings, whether listed or not. Cultural significance of assets is considered in terms described in DPSG Annex 1:
- Intrinsic Characteristics- those inherent in the monument i.e., *“how the physical remains of a site or place contribute to our knowledge of the past”*;
 - Contextual Characteristics – those relating to the monument’s place in the landscape or in the body of existing knowledge i.e., *“how a site or place relates to its surroundings and/or to our existing knowledge of the past”*; and
 - Associative Characteristics – subjective associations, including those with current or past aesthetic preferences i.e., *“how a site or place relates to people, practices, events and/or historic and social movements”*.

Identification of Heritage Assets that may be Affected

Study Areas

- 8.2.10 The ISA corresponds with a 200 m-wide corridor along the proposed OHL route (see Figure 8.2) and has been used to gather baseline data on the known and potential archaeological resource of the route.
- 8.2.11 An OSA has been used for the Stage 1 Setting Assessment which has extended to 1 km from the proposed OHL route (see Figure 8.1). Within this study area all heritage assets within 1 km of the proposed OHL route have been identified, both to further inform the assessment of archaeological potential for the ISA and to identify assets with potential for changes in their setting.

Data Sources

- 8.2.12 The assessment has been based on a study of all readily available documentary sources, following the ClfA Standards and Guidance (2020). The following sources of information were referred to:
- Designation data downloaded from the HES website in August 2023;
 - The National Record of the Historic Environment (NRHE), including the Canmore database and associated photographs, prints, drawings and manuscripts held by HES;
 - Historic Environment Record (HER) data, digital extract received from Dumfries and Galloway, August 2023;
 - Historic Landscape Assessment data, viewed through the HLAMap website;
 - The National Collection of Aerial Photography (NCAP);
 - Geological data available online from the British Geological Survey (BGS);
 - Previous site investigation reports;
 - Historic maps held by the National Library of Scotland;
 - Unpublished maps and plans held by the National Records of Scotland;
 - Relevant internet resources, including Google Maps, Google Earth, Bing satellite imagery and PastMap;
 - Readily available published sources and unpublished archaeological reports.
- 8.2.13 Heritage assets within the ISA and OSA are shown in Figure 8.2, with detailed descriptions compiled in a gazetteer (Technical Appendix 8.1).
- 8.2.14 Non-designated assets are referenced by a unique map number (1, 2, 3, 4, etc) in Figures 8.1 and 8.2. Any newly discovered assets have been assigned a number prefixed HA for 'Heritage Asset'. A single asset number can refer to a group of related features, which may be recorded separately in the HER and other data sources.
- ### Site Visit
- 8.2.15 Two separate site visits were undertaken, initially on the 27 and 28 of September 2023 with a follow up visit on the 25 October 2023, during which notes were made regarding site characteristics, any visible archaeology and geographical/geological features which may have a bearing on previous land use and archaeological survival, as well as those which may constrain subsequent archaeological investigation.
- 8.2.16 Records were made regarding extant archaeological features, such as earthworks or structural remains, any negative features, local topography and aspect, exposed geology, soils, watercourses, health and safety considerations, surface finds, and any other relevant information.

8.2.17 The focus of this chapter is the archaeological potential of and possible impacts to heritage assets within the ISA.

Historic Map Regression

8.2.18 Available online historic mapping sequence corresponding with the ISA was consulted to collect information on former land use and development throughout the later historic periods.

Limitations of the Baseline Data

8.2.19 Information held by public data sources is generally considered to be reliable; however, the following general points are noted:

- Documentary sources are rare before the medieval period.
- Whilst it is accepted that historic documents may be biased depending on the author, with content seen through the lens of context, wherever such documentary sources are used in assessing archaeological potential professional judgment is used in their interpretation in that the functionality of the document is considered.
- HER records can be limited because opportunities for research, fieldwork and discovery depend on the situation of commercial development and occasional research projects, rather than the result of a more structured research framework. A lack of data within the HER records does not necessarily equal an absence of archaeology.
- Where archaeological sites have been identified solely from aerial imagery without confirmation from archaeological excavation or supporting evidence in the form of find-spots for example, it is possible the interpretation may be revised in the light of further investigation.
- The significance of sites can be difficult to identify from HER records, depending on the accuracy and reliability of the original source.
- There can often be a lack of dating evidence for archaeological sites.

8.2.20 Any archaeological site visit has inherent limitations, primarily because archaeological remains below ground level may have no surface indicators.

Assessment of Importance

8.2.21 The importance of a heritage asset is the overall value assigned to it reflecting its statutory designation or, in the case of undesignated assets, the professional judgement of the assessor (see Table 8.1).

8.2.22 Any feature which does not merit consideration in planning decisions due to its significance may be said to have negligible importance. It is the role of the professional judgements made by the assessor to identify any historic remains within the ISA that are considered to be of negligible importance, to justify no further works.

Table 8.1: Criteria for Assessing the Importance of Heritage Assets

Importance of the Asset	Criteria
Very High (International)	World Heritage Sites and other assets of equal international importance, that contribute to international research objectives
High (National)	Inventory Gardens and Designed Landscapes, Scheduled Monuments, Protected Wreck Sites, Inventory Historic Battlefields, Category A and B Listed Buildings, Historic Marine Protected Areas, and non-designated heritage assets of equivalent importance that contribute to national research objectives
Medium (Regional)	Conservation Areas, Category C Listed Buildings, undesignated assets of regional importance except where their particular characteristics merit a higher level of importance, heritage assets on local lists and non-designated assets that contribute to Regional research objectives
Low (Local)	Locally listed heritage assets, except where their particular characteristics merit a higher level of importance, undesignated heritage assets of Local importance, including assets that may already be partially damaged
Regional/ Local	Heritage assets identified by DGHER before 2003 that have not yet been fully categorised.
Negligible	Identified historic remains of no importance in planning considerations, or heritage assets and findspots that have already been removed or destroyed (i.e. 'site of')
Unknown / Uncertain	Heritage assets for which a level of importance cannot be defined on current information. Non-designated assets identified from documentary sources and whose survival and/or heritage significance has not been ground-truthed
Other	Sites identified by the DGHER as minor agricultural features
None	Sites not considered by the DGHER as significant for planning purposes.

8.2.23 The importance of heritage assets that may be affected by the proposed development is identified in the impact assessment and summarised in the Gazetteer (See Technical Appendix 8.1).

8.2.24 Dumfries and Galloway Council categorise heritage assets based on importance and maintain a non-statutory register (NSR). In brief the categories of importance comprise:

- 'National' (existing designated assets and non-designated assets considered to be of schedulable/listable quality);
- 'Regional' (non-designated assets of regional significance and interest);
- 'Local' (non-designated assets of local significance and interest);
- 'Regional/Local' refers to heritage assets identified before 2003 that have not yet been fully categorised;
- 'Unknown' (non-designated assets identified from documentary sources and whose survival and/or heritage significance has not been ground-truthed);

- ‘Other’ is used for minor agricultural features; and
- ‘None’ are sites not considered significant for planning purposes.

Potential for Unknown Heritage Assets

8.2.25 Archaeological features are often impossible to identify through desk-based assessment. The likelihood that significant undiscovered heritage assets may be present within the ISA is referred to as *archaeological potential*. Overall levels of potential can be assigned to different landscape zones, following the criteria in Table 8.2, while recognising that the archaeological potential of any zone will relate to particular historical periods and types of evidence. The following factors are considered in assessing archaeological potential:

- The distribution and character of known archaeological remains in the vicinity, based principally on an appraisal of data in the Dumfries and Galloway HER;
- The history of archaeological fieldwork and research in the surrounding area, which may give an indication of the reliability and completeness of existing records;
- Environmental factors such as geology, topography and soil quality, which would have influenced land-use in the past and can therefore be used to predict the distribution of archaeological remains;
- Land-use factors affecting the survival of archaeological remains, such as commercial forestry, ploughing or quarrying; and
- Factors affecting the visibility of archaeological remains, which may relate to both environment and land-use, such as soils and geology (which may be more or less conducive to formation of cropmarks), arable cultivation (which has potential to show cropmarks and create surface artefact scatters), vegetation, which can conceal upstanding features, and superficial deposits such as peat and alluvium which can mask archaeological features.

Table 8.2: Archaeological Potential

Potential	Definition
High	Undiscovered heritage assets of high or medium importance are likely to be present.
Medium	Undiscovered heritage assets of low importance are likely to be present; and it is possible, though unlikely, that assets of high or medium importance may also be present.
Low	The study area may contain undiscovered heritage assets, but these are unlikely to be numerous and are highly unlikely to include assets of high or medium importance.
Negligible	The study area is highly unlikely to contain undiscovered heritage assets of any level of importance.
Nil	There is no possibility of undiscovered heritage assets existing within the study area.

Stage 1 Setting Assessment

- 8.2.26 The results of a 'Stage 1' Setting Assessment are presented in full in the gazetteer of Technical Appendix 8.1. The Stage 1 Setting Assessment methodology considers each heritage asset in turn to identify those assets which have a wider landscape setting that contributes to their cultural significance and whether it is likely that cultural significance would be harmed by the proposed development.

8.3 Existing Environment

- 8.3.1 There are no designated heritage assets within the 1 km OSA.
- 8.3.2 The Dumfries and Galloway HER contains 70 records for non-designated heritage assets within the 1 km OSA (Figure 8.1).
- 8.3.3 There are 13 non-designated heritage assets recorded within the 200 m ISA (5, 6, 12, 38, 40, 50, 51, 57-59, 67-69) (Figure 8.2). Non-designated heritage assets within the ISA primarily comprise post-medieval sheepfolds (also known as sheep rees) as well as hay rees, farmsteads, rig and furrow earthworks, and enclosures.
- 8.3.4 The field visit carried out on the 25 October 2023 confirmed the location of the sheep ree (5/57) and an unrecorded drystone wall (HA1) which appears on the 1st Edition OS map. However, a recorded enclosure (67) and area of rig cultivation (68) recorded by the Dumfries and Galloway HER could not be seen during the field visit and no longer appear in the landscape.

Known and Potential Heritage Assets within the ISA

- 8.3.5 The HER records 13 records within the 200 m ISA. The closest to the proposed OHL route are a Hay Ree (5/57) between Poles 34 and 35 which is labelled on the 1st Ed. OS map from 1853 and is part of a longer, north-south orientated wall across the landscape (HA1). Another structure (6) is located approximately 77 m to the south of Pole 33, again this is shown as a Hay Ree on the 1st Ed OS map. An area of rig cultivation (68) and a potential enclosure (67) are recorded by the Dumfries and Galloway HER to the north of Pole 33 and another Post-medieval Ree (38) is recorded approximately 163 m to the south of Pole 33. These non-designated heritage assets are of Low importance.
- 8.3.6 A further possible enclosure (58) is recorded approximately 50 m to the north of Pole 25 and areas of rig cultivation (59) are recorded approximately 150 m north of Pole 21. A possible boundary bank (12/50) is recorded approximately 110 m to the north-west of Pole 13 within existing forestry land. These non-designated heritage assets are of Low importance.
- 8.3.7 This assessment identifies that there is a low potential for below ground archaeological remains to be present along the proposed OHL route prior to the Post-medieval period. There is a high potential for remains to be encountered along the OHL route dating to the Post-medieval and modern periods, which most likely comprise features and artefacts relating to agriculture such as land boundaries, sheepfolds and hay rees, which would be of negligible archaeological significance and importance. The existing and extensive commercial coniferous forestry

plantation will likely have heavily truncated any below ground archaeological remains present within the plantation footprint.

8.4 Predicted Impacts and Mitigation

Construction Impacts

- 8.4.1 The assessment has identified a structure interpreted as a sheepfold (5/57) located approximately 20 m to the north of Poles 34 and 35 (Figure 8.3). The structure is attached to a drystone wall land boundary (HA1). The field visit noted that the drystone wall is largely intact and stands to a height of up to 1.2 m in places.
- 8.4.2 The proposed preliminary working area and access works along the route of the proposed development are to be located approximately 8 m to the south and 6 m to the east of the sheepfold (5/57) and the proposed pull position straddles the associated drystone wall (HA1). The proposed pull position would not impact the non-designated heritage asset (5/57), however it has the potential to impact the associated drystone wall (HA1).
- 8.4.3 Mitigation in the form of micro-siting the proposed work areas for new Poles 34 and 35, and avoidance of the drystone wall through the implementation of an appropriate method statement and traffic plan by vehicles during the construction phase is proposed in order to avoid direct impacts upon these known heritage assets.
- 8.4.4 Although the current extent of the proposed work areas would not directly impact enclosure (67) or area of rig cultivation (68) to the north of route, it would be considered appropriate that vehicle movements are limited to follow the marked route and designated work areas in order to avoid accidental damage to these known heritage assets. Vehicles should also be diverted around the existing drystone wall (HA1) to avoid accidental damage.
- 8.4.5 Following implementation of the proposed mitigation measures for identified possible adverse direct physical construction effects upon known heritage assets and archaeological potential, there would be no residual effects.
- 8.4.6 The scope and nature of any mitigation should it be required would be outlined in a written scheme of investigation (WSI) and agreed with Dumfries and Galloway Council in advance of construction, in accordance with NPF4 Policy 7.o, PAN2/2011 sections 25-27, and Dumfries and Galloway Council LDP2 Policy HE3: Archaeology.

Operation Impacts

- 8.4.7 The Stage 1 Setting Assessment presented in the Cultural Heritage Desk-Based Assessment and Stage 1 Setting Assessment (Technical Appendix 8.1) has identified that the settings of no heritage assets are likely to be affected by the proposed development. It is considered that using wood poles rather than steel towers would be less intrusive to the rural landscape, and therefore not affect the setting of the agricultural heritage features. Any change introduced by the proposed development to the receiving rural environment, means that setting impacts are unlikely to cause harm.

8.4.8 None of the heritage assets in the study area are considered to derive cultural significance from their setting. The archaeological, architectural and/or historic significance of each heritage asset would still be fully preserved to be understood, appreciated and experienced should the proposed development be constructed.

Decommissioning Impacts

8.4.9 Potential impacts upon heritage assets during the decommissioning phase are most likely to result from vehicle movements.

8.4.10 The proposed preliminary working area and access works along the route has the potential to directly impact sheepfold (5/57) and the associated drystone wall (HA1). Avoidance of the drystone wall and sheepfold by vehicles through the implementation of an appropriate method statement and traffic plan during the decommissioning and removal phase is therefore proposed. It would also be considered appropriate that vehicle movements are restricted and limited to closely following the marked route and designated work areas in order to avoid accidental damage to enclosure (67) or the area of rig cultivation (68) to the north of the route.

8.4.11 Following implementation of the proposed mitigation measures for identified possible adverse direct physical decommissioning effects upon known heritage assets and archaeological potential, there would be no residual effects.

8.5 Summary

8.5.1 The potential effects arising from the proposed Troston OHL on heritage assets have been considered and assessed. With the inclusion of proposed mitigation measures, no residual effects are likely. A summary of potential impacts is provided in Table 8.3.

Table 8.3: Summary of Impacts

Receptor	Potential Impact	Mitigation	Residual Effect
Sheepfold (5/57)	Accidental direct impact during construction and decommissioning phases	Restriction of vehicle movements to marked access routes and work areas.	None
Drystone Wall (HA1)	Direct impact during construction and decommissioning phases	Restriction of vehicle movements to marked access routes and work areas. Diversion of vehicles around drystone wall.	None
Enclosure (67)	Accidental direct impact during construction and decommissioning phases	Restriction of vehicle movements to marked access routes and work areas.	None
Area of Rig Cultivation (68)	Accidental direct impact during construction and decommissioning phases	Restriction of vehicle movements to marked access routes and work areas.	None

8.6 References

CIfA (2020), Standards and Guidance for Historic Environment Desk Based Assessment. Chartered Institute for Archaeologists.

CIfA (2019), Code of Conduct. Chartered Institute for Archaeologists.

Dumfries and Galloway Council (2019), Local Development Plan 2.

HES (2019), Design and Selection Guidance. Historic Environment Scotland

HES (2020), Managing Change in the Historic Environment: Setting. Historic Environment Scotland.

HES (2021), Historic Environment Policy for Scotland (HEPS) (Historic Environment Scotland)

HES (2019), Designation Policy and Selection Guidance (DPSG) (HES, 2019) to accompany HEPS.

HES (2018), Environment Impact Assessment Handbook. Historic Environment Scotland

IEMA et al (2021), Principles of Cultural Heritage Impact Assessment in the UK. IEMA, IHBC CIfA.

Scottish Government (2023), National Planning Framework 4 (NPF4). Scottish Government.

09.

**Geology,
Peat,
Hydrology
and
Hydrogeology
Appraisal**

9 Geology, Peat, Hydrology and Hydrogeology Appraisal

9.1 Introduction

- 9.1.1 This chapter reports the outcome of the assessment of potential impacts arising from the Troston Overhead Line (OHL) Grid Connection on the surrounding geology, peat, hydrology and hydrogeology during construction, operation and decommissioning.
- 9.1.2 This appraisal, and its associated figures and appendices, are intended to be read as part of the wider environmental appraisal with particular reference to Chapter 7, Appendix 7.1 and Appendix 9.1 Peat Slide Risk Assessment.
- 9.1.3 This appraisal is accompanied by a Peat Slide Risk Assessment. This is provided as Appendix 9.1 and is supported by figures and calculations as required.

9.2 Methodology

Consultation

- 9.2.1 Consultation was undertaken with several statutory and non-statutory consultees and interested parties, including the Scottish Environment Protection Agency (SEPA), NatureScot and Scottish Water, as part of the consultation on the OHL routeing options. Responses with relevance to geology, peat, hydrology and hydrogeology are discussed below.
- 9.2.2 Scottish Water raised concerns that the OHL routes proposed in the Routeing and Consultation Document would be likely to encroach within the Carsfad catchment and possibly other areas which supply the Lochinvar Water Treatment Works (WTW). Taking this into consideration, the proposed OHL is situated within the Black Water catchment, which is separate from the Carsfad catchment and does not supply Lochinvar WTW. Hydrology within the study area is discussed in more detail in Section 9.3 Existing Environment. Impacts on hydrology are discussed in Section 9.4 Predicted Impacts and Mitigation.
- 9.2.3 Scottish Water made reference to their guidance documents '*Precautions to protect Scottish Water Assets during development activities*' and '*Precautions to protect drinking water and Scottish Water assets during development activities*'. Both documents have been taken into consideration while conducting this environmental appraisal and are reflected in the mitigation recommendations made in Section 9.4 Predicted Impacts and Mitigation.
- 9.2.4 SEPA noted the presence of peat and potential groundwater dependent terrestrial ecosystems (GWDTE) on-site and advised these sensitive features be avoided.
- 9.2.5 SEPA also advised adhering to the standing advice provided in Table 2 of SEPA's Triage Framework.

9.2.6 NatureScot had no concerns in relation to the proposed development that are not covered by their standing advice. As such, the following documents have been taken into consideration when writing this Appraisal:

- Advising on peatland, carbon-rich soils and priority peatland habitats in development management (NatureScot, 2023a);
- Guidance on Developments on Peatland: Peatland Survey (Scottish Government, SEPA, NatureScot, 2017).

Scope of the Assessment

9.2.7 This assessment considers potential impacts on geology, peat, hydrogeology and hydrology. Key receptors identified through the scoping process are:

- Surface water;
- Peat and peatland; and
- Public and private water supplies (PWS).

9.2.8 GWDTE are considered as part of the ecology assessment in Chapter 7.

9.2.9 Table 9.1 covers the matters scoped into the assessment and Table 9.2 covers the matters to be scoped out of the assessment.

Table 9.1: Matters to be Scoped into Further Assessment

Matter	Phase	Justification
Particulates and suspended solids	Construction	Construction works would require groundworks which have potential to mobilise particulates and silt, which can cause damage to watercourses if not properly managed.
Water and soil contamination	Construction	A range of potentially polluting materials would be present on-site through the construction phase. These would require careful handling in order to prevent spills and pollution events.
Changes in or contamination of drinking water supplies	Construction	Public water supply and PWS intakes are present near the study area and would require protection from works up-catchment.
Peat instability	Construction	Required by the Energy Consents Unit (ECU).

Table 9.2: Matters to be Scoped out of Further Assessment

Matter	Phase	Justification
Flood risk	Construction and operation	<p>Flood risk within the study area is confined to the Black Water channel and adjacent land areas. No construction works are proposed within flood risk areas.</p> <p>Works are of sufficiently small scale that no increase to downstream flood risk is anticipated, as there would be very limited increase in impermeable ground cover.</p>
Physical changes to overland drainage and surface water flows	Construction	Limited temporary drainage would be required around wood pole foundations and adjacent to temporary access tracks. These would all be as short and shallow as practicable to minimise drainage disruption and would be fully reinstated at the end of the construction period.
Changes in or contamination of water supply to designated sites	Construction	No designated sites with hydrological connection to the study area have been identified within 2 km of the working area.

9.2.10 Within this appraisal, the study area is considered to include the footprint of proposed works plus a 150 m buffer (Figure 9.1). Hydrological concerns also consider areas downstream for a distance of 2 km.

Methodology

9.2.11 This assessment is undertaken through a desk study and inspection of existing geology, peat, hydrology and hydrogeology-related features within the study area. The existing conditions are described and potential risks that may be associated with the proposed development are identified and assessed. This includes damage to surface watercourses and waterbodies, damage to peat and damage to public and private water supplies.

9.2.12 A number of data sources were considered in writing this chapter; the main sources are detailed below:

- Ordnance Survey topographical mapping, current and historical;
- British Geological Survey (BGS) GeoIndex online (BGS, 2023a);
- SEPA's Flood Maps (SEPA, 2023a);
- SEPA's Water Environment and Water Classification Hubs (SEPA, 2023b; SEPA, 2023c);
- UK Meteorological (Met) Office UK climate averages (Met Office, 2023); and

- The Coal Authority's Interactive Map Viewer (The Coal Authority, 2023).
- 9.2.13 Additionally, the following guidance documents have been used during the preparation of this chapter:
- SEPA's Position Statement WAT-PS-10-01: Assigning Groundwater Assessment Criteria for Pollutant Inputs;
 - The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended): A Practical Guide.
- 9.2.14 A combined peat survey and hydrology walkover survey was carried out. This survey measured the depth of the peat along the preferred alignment, using a 50 m spacing with 25 m offsets to either side. Additional records were taken for pole locations that fell between the 50 m survey points, and along proposed lines of temporary access tracks. The survey also identified hydrological features such as watercourses, surface drains and areas of boggy or marshy ground.
- 9.2.15 A risk assessment of nearby PWS was undertaken to identify potential linkages between the proposed development and PWS abstractions. Where relevant, mitigation and control measures are proposed.

9.3 Existing Environment

Meteorology and Climate

- 9.3.1 The study area is located approximately 6.5 km north-east of St John's Town of Dalry, Dumfries and Galloway, within the UK Met Office's Western Scotland climatic region. Much of Western Scotland consists of high ground, with the study area being found in the Southern Uplands region.
- 9.3.2 The climate of Western Scotland is generally milder than in the East. Temperatures are variable depending on topography and distance from the coast, with inland areas having a mean annual temperature of 8.0-9.4°C (Met Office, 2016).

Rainfall

- 9.3.3 Glenlee climate station is situated approximately 8 km south-west of the study area and lies 55 m above mean sea level. Average rainfall patterns at the study area are likely to be similar to those observed at Glenlee, although the study area is at higher altitude than the Glenlee station, so may therefore be expected to experience slightly higher rainfall.
- 9.3.4 The average annual rainfall for the period 1991-2020 at Glenlee climate station is 1,780.61 mm, and the Western Scotland regional average is 1,818.14 mm (Met Office, 2016; Met Office 2023).

Geology

- 9.3.5 Geological information (both bedrock and superficial) is derived from the BGS GeoIndex online geological mapping at 1:50,000 scale (BGS, 2023a) and the BGS Lexicon of Named Rock Units (BGS, 2023b). Bedrock and superficial geology are shown on Figure 9.2 and Figure 9.3 respectively.

Bedrock Geology

- 9.3.6 The bedrock geology consists of Ordovician age wacke sandstone and siltstone turbidite successions of the Shinnel Formation. The study area lies within the Southern Uplands terrane.
- 9.3.7 A small dyke is present at the south-western study area boundary which forms part of the North Britain Siluro-Devonian Calc-Alkaline Dyke Suite. No faults are present within the study area, but the surrounding area is characterised by north-easterly trending thrust (compression) faults.

Superficial Geology

- 9.3.8 Where present, superficial deposits are associated with the valleys and watercourses within the study area, and much of the surrounding higher ground has limited or no superficial deposits.
- 9.3.9 Superficial deposits consist mainly of Devensian diamicton till, described as unsorted sediment with gravel in a fine mud matrix. Smaller areas of alluvium, consisting of silt, sand and gravel, and hummocky glacial deposits of diamicton, sand and gravel, are found around the Black Water, in the north-west of the study area. Peat deposits have been identified as small, isolated pockets around the study area. They largely lie outwith the study area, except from an area around Lochwhinnie Hill, in the northern region of the study area adjacent to one of the access routes.

Soils

- 9.3.10 The National Soil Map of Scotland (Soil Survey of Scotland, 1983) identifies the main soil types as peaty gleys, peaty podzols and mineral gleys, with some smaller areas of brown soils and peat. Most of the study area is made up of soils from the Ettrick Soil Association, with some areas of peat from the Organic Soils Soil Association (Table 9.3). Soils and peat mapping are provided on Figure 9.4.

Table 9.3: Soil Types within the Study Area

Soil Assoc.	Parent Material	Component Soils	Landforms	Vegetation	Area %
Ettrick	Drifts derived from Lower Palaeozoic greywackes and shales	Peaty podzols, peaty gleys; some peat and rankers	Hills with complex strong and steep slopes: non-rocky	Moist Atlantic Heather moor. Heath rush – fescue grassland. Blanket and flying bent bog	58.0
		Noncalcareous gleys, brown forest soils	Hills and valley sides with generally concave, strong and steep slopes	Sharp-flowered rush pasture. Tussock-grass pasture. Acid bent fescue grassland.	18.0
		Peaty podzols,	Drumlins with intervening simple and	Moist Atlantic Heather moor. Heath rush – fescue	9.0

Soil Assoc.	Parent Material	Component Soils	Landforms	Vegetation	Area %
Organic Soils		peaty gleys, peat	complex gentle slopes	grassland. Blanket and flying bent bog	
		Peaty gleys, peat; some peaty podzols	Foothills and undulating uplands with gentle slopes	Moist Atlantic Heather moor. Heath rush – fescue grassland. Blanket and flying bent bog	1.0
	Organic deposits	Dystrophic blanket peat	Uplands and northern lowlands with gentle and strong slopes	Blanket and flying bent bog. Upland and mountain blanket bog	14.0

9.3.11 Areas of carbon-rich soil, deep peat and peatland habitats are identified in NatureScot’s Carbon and Peatland mapping (NatureScot, 2016). Classes 1 and 2 are considered to be nationally important peatland and carbon-rich soils.

9.3.12 The study area includes sections of all five peatland classes plus areas of mineral soil (Class 0), although the areas of Classes 1 and 2 peatlands are small and largely avoided by the proposed infrastructure.

9.3.13 The peatland class descriptions and the proportions present within the study area are provided in Table 9.4.

Table 9.4: Carbon and Peatland Classes within the Study Area

Peatland Class	Description	Area %
Class 0	Mineral soils; peatland habitats are not typically found on such soils	18.0
Class 1	All vegetation cover is priority peatland habitat; all soils are carbon-rich soils and deep peat	4.0
Class 2	Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas of potentially high conservation value and restoration potential	2.0
Class 3	Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland, most soils are carbon-rich.	16.0
Class 4	Area unlikely to be associated with peatland habitat or wet and acidic type; area unlikely to include carbon-rich soils	40.0
Class 5	Soil information takes precedence over vegetation data; no peatland habitat recorded; may also show bare soil; all soils are carbon-rich and deep peat	20.0

9.3.14 Results from the peat survey suggest that most of the study area has no peat. A few small areas of peat have been identified on the southern slope of Lochlee Hill, on

Clachandow Rig and on the northern slopes of Glenshimmeroch Hill. Peat mainly forms small, isolated pockets. No extensive areas of peat have been identified within the study area. Peat was not recorded within the area identified as Class 1 peatland on the northern access track near White Knowe. An overview map of the peat depth distribution within the study area is provided in Figure 9.5.

Topography

- 9.3.15 The study area is located within the Black Water valley. The area is characterised by rolling hills and relatively smooth slopes. The proposed development is surrounded by hills to the north, east and south, most of which are around 350 m in height.
- 9.3.16 Some sections of local rivers are located within relatively incised channels, notably the Black Water at Clachandow Steps and near Catherine's Pool. Other areas have a broader floodplain characterised by wider areas of flat ground.
- 9.3.17 While most of the hill slopes are relatively gentle, steeper areas are present notably on Lochwhinnie Hill, Clachandow Rig and Glenshimmeroch Hill. Some of these areas are characterised by rocky outcrops.

Mineral Extraction

- 9.3.18 The Coal Authority interactive map (The Coal Authority, 2023) and BGS Geoindex (BGS, 2023a) were reviewed to identify any mining or quarrying activities within the study area; there are no active mining or quarrying activities identified.
- 9.3.19 A borrow pit used for aggregate extraction is present at NGR NX6465 8763 in the southern part of the study area. This is not noted to be active at present.

Hydrogeology

- 9.3.20 The study area is underlain by the Galloway groundwater body (ID: 150694), in the Solway Tweed River basin district. The overall status and water quality for the groundwater body were identified as 'good' in most recent data from 2020 (SEPA, 2023b).
- 9.3.21 The study area is underlain by a low productivity aquifer of the Shinnel and Glenlee Formations. Groundwater flow is likely to be nearly all through fractures and other discontinuities (BGS, 2023b).
- 9.3.22 The superficial deposits within the study area have a range of potential permeabilities but their importance as aquifers is restricted by their small area and volume.

Groundwater Vulnerability

- 9.3.23 The majority of the study area has groundwater with an assigned vulnerability class of 4a, defined as 'vulnerable to those pollutants not readily adsorbed or transformed'. Areas of groundwater in the far eastern and western extents of the study area have been assigned vulnerability class 5, meaning they are 'vulnerable to most pollutants, with rapid impact in many scenarios'. A small area of groundwater with assigned vulnerability class 4b is present in the northern region

of the study area, meaning it is ‘vulnerable to those pollutants not readily adsorbed or transformed’ (BGS, 2015).

Groundwater Dependent Terrestrial Ecosystems

- 9.3.24 Groundwater dependent terrestrial ecosystems have been assessed separately. Details are provided in Technical Appendix 7.1 and a summary is included in Chapter 7 (Ecology) accompanied by Figure 7.2.

Hydrology

- 9.3.25 The study area lies almost entirely within the Black Water catchment, as shown on Figure 9.6. The Black Water is a tributary of the Water of Ken, in turn a part of the larger River Dee catchment within the Solway Tweed river basin district.
- 9.3.26 The Black Water drains mainly westward, joining the Water of Ken just downstream of Kendoon Loch. The lower part of the Black Water forms part of the Kendoon power station intake. Within the study area, a number of tributaries feed into the Black Water, notably Lags Strand which drains the north side of Glenshimmeroch Hill, and Fingland Lane which drains the southern slopes of Auchenshinnoch Hill and Meikle Bennan, and the north side of Lochlee Hill.
- 9.3.27 A very small section of the southern part of the study area lies within the Earlstoun Burn catchment. The main watercourse of the catchment is the Earlstoun Burn, which flows west into Earlstoun Loch. The only proposed infrastructure within this catchment is one temporary construction compound.

Water Quality

Surface Waterbodies

- 9.3.28 SEPA’s Water Classification (SEPA, 2023b) and Water Environment Hubs (SEPA, 2023c) have been reviewed to determine the existing baseline water quality for the main watercourses and waterbodies within the study area. The details are summarised in Table 9 5.

Table 9.5: Baseline Surface Water Quality Status Summary

Waterbody name	Status		Pressures
Black Water (ID: 10573)	Condition in 2014	Overall: Poor Water flows & levels: High Physical condition: Good Water quality: High	There are barriers for fish migration due to hydroelectricity generation.
	Classification in 2020	Overall: Poor Biology (fish): Poor Hydromorphology: Good	

Groundwater

9.3.29 SEPA’s Water Classification Hub (SEPA, 2023b) has been reviewed to determine the existing baseline water quality for the groundwater bodies within the study area. The overall status, chemical status and water quality of the Galloway groundwater body (ID: 150694) have all been classified as ‘Good’ in latest available records from 2020.

Private Water Supplies

9.3.30 Private water supply (PWS) information has been collated from the published EIA reports for Margree Wind Farm and Glenshimmeroch Wind Farm, with additional data provided by Dumfries & Galloway Council’s Environmental Health Department.

9.3.31 PWS within 2 km of the study area have been appraised for potential linkage to the proposed works. There are four PWS sources within the study area. These are discussed in Table 9.6 and shown on Figure 9.7.

Table 9.6: Private Water Supplies

Supply Name	Source Location	Source Type	Distance to Proposed Development	Linkages
Glenshimmeroch	264950, 587170	Surface water – Loch	230 m	Potential linkage – construction compound located upslope in same catchment
Marskaig	263926, 588705	Groundwater – Well	960 m	No linkage as PWS in different sub-catchment
Troston Estate Office	268320, 589699	Groundwater – Spring	1,130 m	No linkage as PWS is upstream from the study area
Troston Farm	268600, 589600	Groundwater – Spring	1,270 m	No linkage as PWS is upstream from study area

Flood Risk

9.3.32 SEPA’s Flood Map (SEPA, 2023a) was reviewed to gain an overview of the likelihood of flooding within the study area.

9.3.33 Flood risk is shown to be relatively minor within the study area, with some localised regions of surface water (pluvial) and river (fluvial) flood risk. River flooding is largely confined to the main channel of the Black Water, with a larger area indicated at the foot of Lochwhinnie Hill where the ground is very flat. The main channel of the Black Water has a high likelihood of flooding, defined as having a 10% chance of a flood event in any given year. There are very minor areas at high risk of surface water flooding within the study area.

Designated Sites

- 9.3.34 There are no designated sites of relevance to hydrology, hydrogeology, geology or soil within the study area. The Cleugh Site of Special Scientific Interest (SSSI) is approximately 3.2 km from the study area's south- western boundary (NatureScot, 2023c).

9.4 Predicted Impacts and Mitigation

Proposed Development Characteristics

- 9.4.1 The construction phase of the proposed OHL would involve several different elements. Chapter 4 of this report describes the scheme elements in detail. The elements with relevance to geology, peat, hydrology and hydrogeology are as follows:
- Construction of temporary access routes and watercourse crossings;
 - Excavation during installation of wood poles and short section of underground cable;
 - Creation of temporary laydown areas and construction compounds;
 - Temporary welfare facilities including water supply and foul water disposal; and
 - Excavation, handling and temporary storage of peat and soils.
- 9.4.2 There are no activities likely to occur during operation of the proposed development that are anticipated to have a noticeable impact on geology, peat, hydrogeology, or geology.

Construction Impacts

Particulates and Suspended Solids

- 9.4.3 All development work involving earthmoving operations would generate loose sediment, which could potentially gain access to surface watercourses and waterbodies through entrainment in surface runoff. This could potentially have an adverse effect on the downstream watercourses through damage to fish spawning habitat and changes to dissolved oxygen and nutrient levels in watercourses and waterbodies.
- 9.4.4 All works involving stripping of vegetation and/or excavation of soil materials or peat would require installation of sediment control measures prior to breaking ground. These control measures would take the form of silt fencing installed downslope of any stripped ground, excavations or stockpiled soils or peat. Temporary cut-off drains may be required upslope of excavations or stripped ground to divert surface water around these areas to prevent sediment becoming entrained in the water.
- 9.4.5 Should works in wetter periods be required by the programme, settlement ponds or sumps may be necessary adjacent to areas of stripped ground or excavations

where water can be held and sediment allowed to settle before discharge to ground.

- 9.4.6 Collected water would not be discharged directly into any surface watercourse or waterbody.
- 9.4.7 All required watercourse crossings would make use of temporary structures with a clear span over the watercourse channel. No in-stream works would be required at any crossing location. Temporary crossings would include splash protection as appropriate to minimise release of sediment into watercourses. All crossing structures would be removed upon completion of construction works. Any required authorisations for crossings would be put in place ahead of works commencing.
- 9.4.8 Owing to the limited requirement for ground works, and allowing for implementation of appropriate mitigation as set out above, the residual effect is determined to be minor.

Water or Soil Contamination from Fuels, Oils or Foul Drainage

- 9.4.9 Spillage of fuels, oils or wastewater from welfare facilities could have an adverse effect on surface or groundwater and soil quality. Major spillages could have a widespread influence on watercourses if direct entry into flowing water occurred.

Foul Drainage Provision

- 9.4.10 Foul drainage would be required for the site welfare facilities. It is anticipated that the welfare facilities would have a suitably sized holding tank which would be emptied by tanker and removed from site for disposal at a suitably licensed facility.

Spillage and Emergency Procedures

- 9.4.11 Spillage of fuels, oils, wood pole preservatives or foul drainage could have an adverse effect on surface and groundwater quality, and major spillages could have a potential influence on the Black Water catchment, the local groundwater, and to a lesser extent on the Earlstoun Burn catchment as a result of the small infrastructure footprint in this catchment.
- 9.4.12 Oil and fuel storage and handling within the study area would be undertaken following published guidance, in particular Guidance on Pollution Prevention 2 – Above ground oil storage tanks (SEPA, 2017a) and in compliance with the Water Environment (Controlled Activities) (Scotland) Regulations 2011 as amended.
- 9.4.13 All locations used for storage of fuels, oils or other potentially polluting materials would be at least 50 m from any watercourse or waterbody and at greater distance where possible. Additional pollution prevention measures would be included at all storage locations, including use of an impermeable surface and self-contained drainage system to ensure that drips and spillages are contained.
- 9.4.14 Site Spillage and Emergency Procedures would be prominently displayed at the construction work locations and staff would be trained in their application. The Procedures document would incorporate guidance from the relevant SEPA Guidance Notes.

- 9.4.15 Pollution prevention measures and spillage control measures would be clearly displayed at the site office and all staff trained in their requirements and appropriate use of spill kit materials that are available on-site.
- 9.4.16 As a result of the limited scale of works and the small quantities of potentially polluting materials to be stored on-site, and allowing for implementation of appropriate mitigation and control measures as set out above, the residual effect is determined to be minor.

Changes in or Contamination of Drinking Water Supplies

- 9.4.17 One PWS source has been identified as potentially at risk from proposed works. Scottish Water has identified that the catchment area for the Lochinvar water treatment works may also be at risk from proposed works.
- 9.4.18 Glenshimmeroch PWS source is located approximately 230 m south-east of the proposed temporary construction compound adjacent to the Glenshimmeroch substation. The construction compound is located just within the Earlstoun Burn catchment, and there is a potential linkage between the construction compound and the PWS source.
- 9.4.19 In order to mitigate the risk to the PWS source, the following protection measures would be installed at the construction compound:
- A cut-off drain would be installed immediately downslope of the compound. This would be linked into the compound's drainage system and would act to capture any contaminated runoff from the compound surface.
 - A dedicated drainage system within the compound area, where any surface water can be collected and treated if required to remove any contaminants prior to discharge.
 - At least two properly installed sections of silt fence downslope of the cut-off drain to collect any runoff that is not fully captured by the cut-off drain.
 - Twice daily monitoring of the PWS source location while any work is ongoing at the compound and when the compound is being used to store any potentially polluting materials. The monitoring would involve visual inspection for traces of oil, fuels or suspended sediment, plus in situ monitoring for pH and electrical conductivity. Should any change to baseline conditions be identified, all works at the compound area would be stopped immediately and the Site Manager informed. Works would not be permitted to restart until suitable checks have been undertaken and the Site Manager is satisfied that the incident is under control.
- 9.4.20 No works are proposed within the Lochinvar catchment area. It is therefore highly unlikely that any effects on the public water supply would arise from the proposed works.
- 9.4.21 Assuming that appropriate management of the temporary construction compound is put in place, including methods for handling and storing potentially polluting materials as set out above, the residual risk of impact to the PWS source is minor.

9.4.22 The risk to public water supply is negligible.

Peat Instability

9.4.23 A peat slide risk assessment (PSRA) has been undertaken for the proposed development, which is provided in Technical Appendix 9.1.

9.4.24 The assessment found that the majority of the study area has a negligible or low risk of peat landslide, or no peat. Five areas were identified as having potential risk of peat landslide and have been appraised in greater detail taking into account location-specific details. In all cases, the risk was found to have been over-estimated as a result of the assessment mechanism and the precautionary approach taken to estimating risk.

9.4.25 Mitigation measures have been recommended for all areas to control the peat landslide risk. For all areas, the risk can be controlled by use of good construction practice and micrositing.

9.4.26 Residual risk rankings are negligible or low for all identified potential high risk areas.

Operation Impacts

9.4.27 No activity with potentially significant impacts is anticipated to occur during operation of the proposed development.

9.4.28 Any required maintenance or pole replacement work during the operational period would have environmental control measures put in place, in line with those specified under Construction Impacts above. Any required trackways or watercourse crossings would make use of low ground pressure plant, track mats and temporary crossing structures where necessary to ensure that ground impacts are kept to a practical minimum.

Decommissioning Impacts

9.4.29 Potential effects of decommissioning the proposed development are anticipated to be similar or less to those encountered during the construction phase, as the level of activity would be lower.

9.4.30 Discussion would be held between the SPEN and the appropriate regulatory authorities prior to decommissioning to agree an appropriate Decommissioning Strategy and Restoration Plan.

9.5 Summary

9.5.1 The potential effects arising from the proposed Troston OHL Grid Connection on the surrounding geology, peat, hydrology and hydrogeology have been considered and assessed. Where relevant mitigation measures have been proposed that would help to prevent or reduce impacts that may arise from construction or decommissioning of the proposed grid connection. No activity with potentially significant impacts is anticipated to be required during the operational phase.

9.5.2 As a result of the control measures put in place, the proposed grid connection is anticipated to have minor effects on the geology, peat, hydrology and

hydrogeology of the study area. A summary of potential impacts and proposed mitigation measures is provided in Table 9.7.

Table 9.7: Summary of Impacts

Receptor	Potential Impact	Mitigation	Residual Effect
Surface water	Pollution of surface water through particulates and suspended solids	Installation of sediment control measures prior to breaking ground including silt fences, cut-off drains and settlement ponds.	Minor
Surface water, groundwater and/or soils	Pollution of surface water, groundwater and/or soils through contamination	Foul drainage provision using a holding tank and off-site disposal. Careful handling and storage of oil, fuels and other potentially polluting materials, with storage at least 50 m from watercourses. Pollution prevention measures and spillage procedures would be established and adhered to.	Minor
Drinking water supplies	Pollution of drinking water supplies	Installation of cut-off drain to capture runoff from the compound. Use of a dedicated drainage system within the compound. Installation of silt fencing between compound and PWS source. Regular monitoring of PWS source.	Minor
Peat	Loss of peat, pollution of surface water, damage to infrastructure	Implementation of good construction methods and micro-siting. All construction works supervised by Environmental Advisor. Installation of sediment control measures prior to breaking ground including silt fences, cut-off drains and settlement ponds.	Minor

9.6 References

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10.

**Forestry
Appraisal**

10 Forestry Appraisal

10.1 Introduction

10.1.1 This technical appraisal provides the forestry information required for the assessment of the impact of the proposed development on the existing forestry resource, including:

- a baseline forestry assessment;
- the effect of the proposed development on the forestry plantations;
- full information on the areas to be felled and the timber volumes to be removed;
- how the waste will be dealt with to minimise its effect on the environment; and
- mitigation measures proposed including compensatory planting.

10.2 Methodology

Policy Context

UK Forestry Standard

10.2.1 The overarching document for forestry management is the UK Forestry Standard (revised 2017) (UKFS). It is the reference standard for sustainable forest management in the UK. UKFS outlines the context for forestry, sets out the approach of the UK governments to forestry, defines standards and requirements and provides a basis for regulation and monitoring – including national and international reporting. UKFS’s approach is based on applying criteria agreed at international and European levels to forest management in the UK. It has been endorsed by the UK and the Scottish Government and applies to all UK forests and woodlands. In general, there is a strong presumption against woodland removal, and restocking of harvested forests is a normal condition of felling approval being granted.

10.2.2 The ability of woodlands to sequester carbon, and hence their role in possible mitigation of climate change is an important factor in shaping regulatory mechanisms.

Scottish Forestry Strategy (2019)

10.2.3 The Scottish Forestry Strategy (SFS) is the Scottish Ministers’ framework for taking forestry through the first half of this century and beyond. The SFS sets out the following commitments:

- to increase Scotland’s woodland cover to 21 % by 2032;
 - 12,000 ha per year from 2020/21;
 - 14,000 ha per year from 2022/23; and

- 15,000 ha per year from 2024/25.
- Increase the contribution of forests and woodland to Scotland’s sustainable and economic growth;
- Improve the resilience of Scotland’s forests and woodlands and increase their contribution to a health and high-quality environment; and
- Increase the use of Scotland’s forest and woodland resources to enable more people to improve their health, well-being and life chances.

Scottish Land Use Strategy (2016)

- 10.2.4 The Scottish Land Use Strategy (SLUS) is a strategic framework for achieving the “best” use from Scotland’s land resource. It aims to achieve a more integrated approach to land use, maintaining the future capacity of the land resource and is based on the three pillars of sustainability: economy, environment and communities.
- 10.2.5 Attaining multiple benefits from land is a key theme, and the focus on forestry is the identification of areas best for tree planting in an integrated land use system. To increase its role in addressing the challenge Scotland faces from climate change, a target of 100,000 ha of new woodland creation between 2012 – 2022 was established. Regional Forestry and Woodland strategies developed by local authorities are identified as the delivery mechanism to promote good practice and multi benefit land use.

National Planning Framework 4 (2023)

- 10.2.6 The National Planning Framework 4 (NPF4) acknowledges the economic value of woodlands and forestry in addition to their ecological value. Development proposals involving woodland removal will only be supported where they will achieve significant and clearly defined additional public benefits in accordance with relevant Scottish Government policy on woodland removal. Where woodland is removed, compensatory planting will most likely be expected to be delivered (p45, Scottish Government, 2023).

Forestry and Land Management (Scotland) Act (2018)

- 10.2.7 The felling of trees is regulated under the Forestry and Land Management (Scotland) Act 2018. Consent for the felling proposed would be secured through either modifications to existing licenses or under new licenses in accordance with this legislation.

Policy on the Control of Woodland Removal (2009)

- 10.2.8 The Scottish Government’s policy document on the Control of Woodland Removal (CWR) Policy and accompanying Implementation Guidance (2019) (Appendix A) provides guidance on the policy and process for managing the implementation of the CWR Policy in respect of forestry removal on development sites. The principal aims of the CWR Policy are to provide a strategic framework for appropriate woodland removal and to support climate change mitigation and adaptation. The CWR Policy is built on the following principles:

- A strong presumption in favour of protecting Scotland's woodland resource;
- Woodland removal should be allowed only where significant and clearly defined additional public benefit can be demonstrated. A proposal for compensatory planting may add additional public benefit;
- Approval for woodland removal should be conditional on the undertaking of actions to ensure full delivery of the defined additional public benefits;
- Planning conditions and agreements are used to mitigate the environmental impacts arising from development and Scottish Forestry (SF) would also encourage their application to development related woodland removal; and
- Where felling is permitted but woodland removal is not supported, conditions conducive to woodland regeneration should be maintained through adherence to good forestry practices as defined in the UKFS.

10.2.9 The CWR Policy identifies the following criteria for areas where woodland removal may occur without a requirement for compensatory planting:

- enhancing priority habitats and their connectivity;
- enhancing populations of priority species;
- enhancing nationally important landscapes, historic environment and geological SSSIs;
- improving conservation of water resources;
- improving conservation of soil resources; and
- public safety.

10.2.10 Woodland removal with compensatory planting, is most likely to be appropriate where it would contribute significantly to:

- helping Scotland mitigate and adapt to climate change;
- enhancing sustainable economic growth or rural/community development;
- supporting Scotland as a tourist destination;
- encouraging recreational activities and public enjoyment of the outdoor environment;
- reducing natural threats to forests or other land; or
- increasing the social, economic or environmental quality of Scotland's woodland cover.

Consultation

10.2.11 Scottish Forestry was consulted as part of the overhead line (OHL) routeing study stakeholder consultation in October 2022. In addition to expressing their preference for a route option with least disruption to forestry, Scottish Forestry noted the potential for windblow from additional felling which could negatively disrupt developing forest structure.

- 10.2.12 The route option with the least disruption to forestry was assessed as the least favourable option for ecology, ornithology, visual amenity, archaeology and cultural heritage, geology, peat, hydrology and hydrogeology and land use and recreation. Therefore, this route option was not taken forward as the proposed route.
- 10.2.13 The embedded mitigation that has been included in the design of the proposed development to minimise disruption to forestry is included in Section 10.4. The potential for windblow has been considered as part of this forestry appraisal in Section 10.4.

Scope of the Assessment

- 10.2.14 This assessment covers the proposed route of the new OHL that would run through Glenshimmeroch Forest on the west to north-west and north forested base of Glenshimmeroch Hill. The OHL would exit the plantation onto open ground then enter the Troston Estate plantation just east of Lochwhinnie Hill. The plantations and the study area is described in Table 10.1 below.

Table 10.1: Standard Terms

Standard Terms	Description
Glenshimmeroch Forest	Commercial forest plantation managed by Scottish Woodlands for Messrs Norgate (see Figure 10.1)
Troston Estate	Commercial forest plantation centred around Troston (see Figure 10.2)
Study Area	Covers all of the woodlands affected by the proposed OHL route. This covers a swathe width of 30 m either side of the proposed OHL for the wayleave corridor (i.e. a total swathe width of 60 m) (Figure 10.3)

- 10.2.15 The assessment covers the impact on the forestry resource from the felling that would be required for the wayleave corridor (30 m either side of the OHL) as well as any felling required for the proposed access tracks and temporary construction compounds.

Methodology

Baseline Data Collection

- 10.2.16 The focus of the forestry assessment/appraisal (when considering potential impacts on commercial forestry) is to define the existing timber conditions and yield class assessed by walkover survey (carried out on 9 October 2023). Photographs to support findings and information on species composition, age class and forestry structure are included in Appendix 10.1. Existing forestry plans (where available) were reviewed to assist with the assessment.
- 10.2.17 The aim of the assessment is:

- to clearly show where felling will occur (including summary of works programme and felling techniques;
 - including how this will be conducted to minimise potential release of nutrients;
 - timber volume calculations to estimate timber removal, proposed mitigation/enhancement (e.g. peatland restoration and compensatory planting requirement); and
 - the subsequent affect all this will have to ongoing forestry resource and management (supported with likely revisions to existing forestry plans).
- 10.2.18 The survey method used standard forest mensuration techniques to establish standing timber volumes in mature timber crops. Two mensuration sample plots were taken at each stop point at 15 m out, either side and perpendicular to the route. Timber measurement was recorded using relascope sweeps and top height of largest tree in each sample plot. A visual assessment of age and growth stage was applied where young restock crops have been recently planted.
- 10.2.19 To assist with remote interpretation of each survey point location a photographic record of the north, east, south, and west directional view was recorded. Sample plots and photographs were geolocated using Avenza mapping software.

Assessment Methodology

Guidance

- 10.2.20 As there are no published criteria, guidance or methodologies in relation to the assessment of effects on forestry. The assessment is therefore based on professional judgement informed by available forestry plans (and supporting information), field work, local management experience and consultation.
- 10.2.21 The assessment has however taken account of statute, guidance and advice where applicable including:
- FC (FLS) Technical paper 16 Designing Forest Edges to improve wind stability (1996);
 - FC Forest Yield: A handbook for forest growth and yield tables for British forestry (2016);
 - Forest Research, Forest Gales 2.5 model for predicting risk of windthrow;
 - Scotland’s Forestry Strategy 2019-2029;
 - UK Forestry Standard 2017; and
 - UK Woodland Assurance Standard.

Assessing Significance

- 10.2.22 The significance of the effects has been approached as follows;
- Identifying the existing conditions;
 - Assessing the likely effects on the woodlands;
 - Confirming whether the effects are positive or negative;

- Assessing the significance of the effects;
- Where there is likely to be a negative effect, decide how best to reduce or mitigate the effect; and
- Consider the long-term effect following the application of any mitigation.

Sensitivity

10.2.23 There are no known published guidance on methodologies for assessing the sensitivity of woodland. So the sensitivities have been drawn up based on the views of a highly experienced Chartered Forester. The categories shown in Table 10.2 have been used to assess the sensitivity of the effects on the forestry plantations and other woodlands.

Table 10.2: Woodland Sensitivity Criteria

Sensitivity	Criteria
High	Ecologically sensitive e.g. ancient semi-natural woodlands Woodlands subject to other designations e.g. Native Woodland Survey of Scotland Rare or distinctive woodlands High value from a public recreation point of view Vulnerable to small changes
Moderate	Locally important woodlands Some public recreation Susceptible to moderate changes
Low	No local or national importance Woodlands not used for public recreation Woodlands where some change is part of normal forestry management
No obvious sensitivity	Woodlands where major changes (e.g. large scale felling) are part of normal management Woodlands with little landscape value No public recreation No special ecological value

10.2.24 The sensitivity of forestry management to the effects of the wayleave felling for construction has been determined taking additional account of:

- The productivity of the plantations, based on their yield class;
- Accessibility of the plantations for felling and timber extraction; and
- Size of the woodlands and whether they are managed commercially or not.

10.2.25 It should be noted that not all aspects considered within the example conditions are required concurrently to define the sensitivity level, which is assigned based on professional judgement.

Magnitude

10.2.26 The following criteria, shown in Table 10.3 have been used to assess the magnitude of changes from the wayleave clearance.

Table 10.3: Magnitude of Impact Criteria

Sensitivity	Criteria
Major	A significant change to the woodland taking into account the size of the woodland and the scale of the clearance
Moderate	A small change to the woodlands taking into account the size of the woodland and the scale of the clearance
Minor	A very little change to the woodland taking into account the scale of the size of the woodland and the scale of the clearance
None	No change

10.3 Existing Environment

10.3.1 Glenshimmeroch Forest centred around Glenshimmeroch Hill is located 7.21 km north-east of St Johns Town of Dalry, in the county of Dumfries and Galloway. The longest section of the proposed OHL route through the Glenshimmeroch Forest is centred on grid reference NX650885 which is approximately 1.1 km east south-east of Marskaig Hill. The shorter section runs through the Troston Estate plantation, centred on grid reference NX673888, is 460 m east by south-east of Lochwhinnie Hill.

Long Term Management Plans (LMP)

10.3.2 LMPs are not available for this assessment. Scottish Woodlands, who manage the Glenshimmeroch Forest, provided a felling phase map and compressed compartment schedule. There is no LMP available for the Troston Estate holding.

Forest Crops

10.3.3 Baseline crop species in the study area have been derived from information provided by Scottish Woodlands based on their Forest Species Plan Map and associated compartment schedule of 15 June 2018 (Appendix 10.2). Comparative data for Troston Estate is based on Table 13.2: Baseline Species Composition in EDF Renewables 'Troston Loch Windfarm EIA Report' (2019) and associated maps (Figures 13.2 and 13.3).

10.3.4 Table 10.4 and Table 10.5 detail the baseline tree species and areas. Sitka spruce is the dominant species in Glenshimmeroch Forest and Troston Estate. Mixed conifers and mixed broadleaves represent relatively small areas of the tree crops. The open ground component in Glenshimmeroch Forest and Troston Estate is greater than the minimum recommended ten percent in the UK Forest Standard. This gives scope for compensatory planting with negligible effect on retained open ground.

10.3.5 It should be noted that there has been restocking of clearfelled areas in the study area in Glenshimmeroch Forest since 2018. For instance, compartments 13 and 14 (see Appendix 10.2) have been restocked with Sitka spruce and a small area of mixed broadleaves.

Table 10.4: Summary of Woodland Crops within Glenshimmeroch Forest

Species	Area (ha)	Area (%)
Open ground	269.52	48.2
Sitka spruce	257.79	46.1
Mixed Conifers	11.67	2.1
Hybrid larch	4.97	0.9
Douglas fir	3.83	0.7
Norway spruce	3.54	0.6
Mixed conifers/mixed broadleaves	0.78	0.1
Mixed broadleaves	0.36	0.1
New mixed broadleaves	6.2	1.1
Unplanted	0.05	0.0
Total	558.71	100.0

Table 10.5: Summary of Woodland Crops within the Troston Estate

Species	Area (ha)	Area (%)
Open ground	65.5	14.9
Sitka spruce	251.5	57.3
Sitka spruce/mixed Conifers	7.8	1.8
Mixed broadleaves	29.3	6.7
Felled awaiting restocking	14.4	3.3
Other land - farmland and wayleaves	27.4	6.2
Total	42.7	9.7
Total	438.6	100.0

Statutory Designed Woodlands

- 10.3.6 There are no statutory designated woodlands within the proposed development footprint or any associated felling areas.

Species

- 10.3.7 Current species in the study area have been derived from information provided by Scottish Woodlands based on their Glenshimmeroch Forest subcompartment data and from plotting of mapped data for the Troston Estate. Table 10.6 lists the species and areas within the felling area if taken up to windfirm edges. Note that information on open ground between or within compartments was not available. The boundaries were ‘ground truthed’ on site. Net area is given an industry standard value of 85% crop coverage with a nominal 15% within each canopy area assumed as open space for forest drains and internal rides.

Table 10.6: Existing Species and Areas in the study area taken from Subcompartment Data and Mapping

Species	Gross Area (ha)	Net Area (ha)	Species Composition (%)
Sitka spruce	22.16	18.83	95.97
Hybrid larch	0.69	0.59	2.99
Mixed broadleaves (in tubes)	0.24	0.20	1.04
Total	23.09	19.63	100

Restock Crops

- 10.3.8 The proposed OHL route runs through three recently restocked areas; two in Glenshimmeroch Forest which are divided by a forest road and one in Troston Estate, to the south-east of Lochwhinnie Hill. The former is estimated to be approximately three years old and contain predominantly Sitka spruce with a small area of Sessile oak in tree shelter tubes at the southernmost point. The compartment to the south of the forest road has an estimated 80% establishment success (Photograph 4 in Appendix 10.1) and that to the north estimated at 90% establishment (Photograph 5 in Appendix 10.1). The crop near Lochwhinnie Hill at Troston Estate, estimated at seven years old, is successfully established and can be considered fully stocked (Photograph 6 in Appendix 10.1). There is a small area of estimated 12 year old Sitka spruce in the Troston Estate between the forest road and the start of the OHL 30 m wayleave end point.
- 10.3.9 Site climatic suitability for Sitka spruce is available on the Scottish Forestry Mapping Viewer. This is relevant to the potential productivity of the plantations. This suggests Sitka spruce as the most suitable productive species, given that the soils are classified by the Scottish soils viewer as peaty podzols and peaty gleys, to which this species is suited. It should be noted that even Sitka spruce exhibits

checked growth on the flatter peaty gleyed soils. Larch grows well on sloping ground where peaty podzols are encountered. The Scottish Forestry Viewer suggests that other conifers such as Norway spruce and Scots pine are suitable on the lower slopes of Glenshimmeroch Hill too. Sessile oak is establishing in tree shelters on the restock area. The Scottish Forestry Mapping Viewer indicates that mixed broadleaves suitability for this area is marginal.

Yield Classes

- 10.3.10 Yield Class (YC) is a measure of timber volume increase in cubic metres per hectare per year. YC data, see Table 10.7, has been provided by Scottish Woodlands for Glenshimmeroch Forest. No data were available for the Troston Estate. Yield classes for mature Sitka spruce in Glenshimmeroch Forest range between YC16 and YC20, giving a YC18 average. Only one hybrid larch compartment is assigned YC16.
- 10.3.11 Mixed broadleaves under these climatic conditions are usually found to be YC4 to YC6. Recently restocked areas have not been assigned a YC.

Table 10.7: Yield Class and Planting Year for Mature Tree Crops in Glenshimmeroch Forest

Compartment	Species	Planting Year	YC
1	Sitka spruce	1987	20
1	Hybrid larch	1987	No data
2	Sitka spruce	1987	20
6	Sitka spruce	1987	18
7	Sitka spruce	1987	20
7	Hybrid larch	1987	No data
8	Sitka spruce	1987	16
8	Hybrid larch	1987	16
15	Sitka spruce	1987	18

Age Classes and Restructuring

- 10.3.12 The Glenshimmeroch Forest is in the process of being restructured with compartments of clearfelled areas restocked with predominantly Sitka spruce and a small number of mixed broadleaves. This covers the southern section of the proposed OHL route. The restocked compartments in Glenshimmeroch Forest are estimated to have been planted three years ago for area of the OHL route and seven years ago for the proposed southern construction compound and substation area. The restocked crops in the Troston Estate holding are estimated at seven years old for the proposed OHL route and northern construction compound with a

small area in the Troston Estate holding of estimated 12 year old crop for the initial access road off the main forest track.

Felling Phases

- 10.3.13 The Scottish Woodlands 'Felling Phases Changes' map (see Appendix 10.2) provides detail of planned felling periods, with phase 2, compartments 12, 13 and 14 already complete and restocked. Current work on site is focused on phase 3 (2023 to 2028), compartments 8, 9 and 15. Compartments 1 and 7 (phase 7) are planned as long term retention and do not fall within the current approved felling plan.
- 10.3.14 Therefore, felling phase 3 (compartments 8, 9 and 15) may coincide with the installation of the proposed OHL and its infrastructure depending on the actual time of commencement. However, compartments 1, 6 and 7 ('Beyond phase 7) would require the relevant statutory permissions before works commence.

Timber Size

- 10.3.15 Timber size varied along the proposed OHL wayleave route in Glenshimmeroch Forest with top heights ranging from 16.2 m and 26.5 m and diameter at breast height (dbh) in the range expected for the given yield classes. It should be noted that predicted timber size from expected yield class differed on the ground especially on the flatter peaty ground where some of the crops showed significant check. However, timber size was above predicted yield class size on the freer draining slopes. The mensuration data for the surveyed subcompartments can be found in Appendix 10.3.

Timber Quality

- 10.3.16 The quality of the mature timber in Glenshimmeroch Forest is typical for these plantations' types of species, yield class and age. It should be noted that Sitka spruce trees were observed as having checked (stunted) growth along the OHL wayleave route in compartments 1, 6, 7 (north end of 8) and 15 due to potentially waterlogged flatter ground. Therefore, the volume of timber is lower than the remainder of the crop. Timber quality was typical of expected yield class on the sloping ground above. The photographs in Appendix 10.1 provide an indication of the size and quality of the timber and are illustrative of the types of timber present on the study area.

Windblow

- 10.3.17 Slight windblow was noticeable on the southern edge of compartment 15. This was not noted, apart from the occasional trees, in the rest of the survey area. However, it should be noted that Storm Arwen has caused significant windblow in adjacent parts of the plantation as can be seen from a comparison of Google Earth satellite imagery taken on 7 March 2018 and 29 April 2022.

10.4 Predicted Impacts and Mitigation

Embedded Mitigation

- 10.4.1 In relation to forestry, the key objective of the proposed development has been to minimise the amount of tree felling, and all felling for the installation of the proposed OHL would be based on linear felling and felling back to windfirm edges.
- 10.4.2 A desktop review of site relevant information to identify constraints and opportunities was completed. Site compartment schedules (where available) and Forest Gales were used to obtain background information of yield class and windthrow hazard class. An assessment of windfirm edges was made visually on site and aerial imagery interpreted to locate the nearest windfirm edge to reduce loss of standing crops.
- 10.4.3 Existing access tracks have been utilised wherever possible but where it has not been possible to use existing tracks the shortest possible route has been chosen subject to avoiding watercourses or other environmentally sensitive areas.

Construction Impacts

OHL Route

- 10.4.4 Linear felling on either side of the proposed OHL route is required for the 'wayleave corridor', which includes an area of 30 m either side of the proposed OHL. This is the minimum area required for safe felling distances and safe line clearances. The objective has also been to retain the current windfirm edges of sub-compartments wherever possible and the prevailing south westerly winds have also been taken into consideration. The OHL wayleave corridor felling involves removal of mature and restock crops. Table 10.8 shows felling areas required for the installation of infrastructure and clearance up to windfirm edges.

Table 10.8: Felling Areas Required for Installation of Infrastructure and Clearance up to Windfirm Edge

Comp. No.	Area Lost to OHL Wayleave (ha) (does not include Windfirm edge or infrastructure)	Area Lost to Infrastructure (ha) (does not include OHL wayleave or Windfirm edge)	Area Lost to Windfirm Edge (ha) (does not include Wayleave or Infrastructure)	Nett Area Loss (Wayleave + Infrastructure + Windfirm Edge (ha) (less 15% for open ground, rides etc)	Species
GF 1b	0.57		1.48	1.74	Sitka spruce
GF 1c	0.03			0.02	Hybrid larch
GF 2a	0.00		2.74	2.33	Sitka spruce
GF 6a	0.57		0.04	0.52	Sitka spruce
GF 7a	0.87		0.95	1.55	Sitka spruce
GF 7b	0.09		0.55	0.54	Hybrid larch

Comp. No.	Area Lost to OHL Wayleave (ha) (does not include Windfirm edge or infrastructure)	Area Lost to Infrastructure (ha) (does not include OHL wayleave or Windfirm edge)	Area Lost to Windfirm Edge (ha) (does not include Wayleave or Infrastructure)	Nett Area Loss (Wayleave + Infrastructure + Windfirm Edge (ha) (less 15% for open ground, rides etc)	Species
GF 8a	1.90	0.03	1.81	3.18	Sitka spruce
GF 8b	0.36		0.01	0.31	Hybrid larch
GF 12a	0.12			0.10	Sitka spruce
GF 13a	1.95			1.66	Sitka spruce
GF 13b	0.44			0.37	Sitka spruce
GF 14a	1.23			1.05	Sitka spruce
GF 15a	1.35		1.16	2.13	Sitka spruce
GF 15b			2.67	2.27	Sitka spruce
TE 24	1.77			1.50	Sitka spruce
Total areas	11.25	0.03	11.41	19.28	

GF – Glenshimmeroch Forest, TE – Troston Estate

Access Tracks

10.4.5 The width of the access routes has been kept to the minimum required for the transportation of the construction materials. A 10 m width has been allowed for where access tracks cut through standing crops. It would however be necessary to carry out some additional felling for passing places and on bends as required.

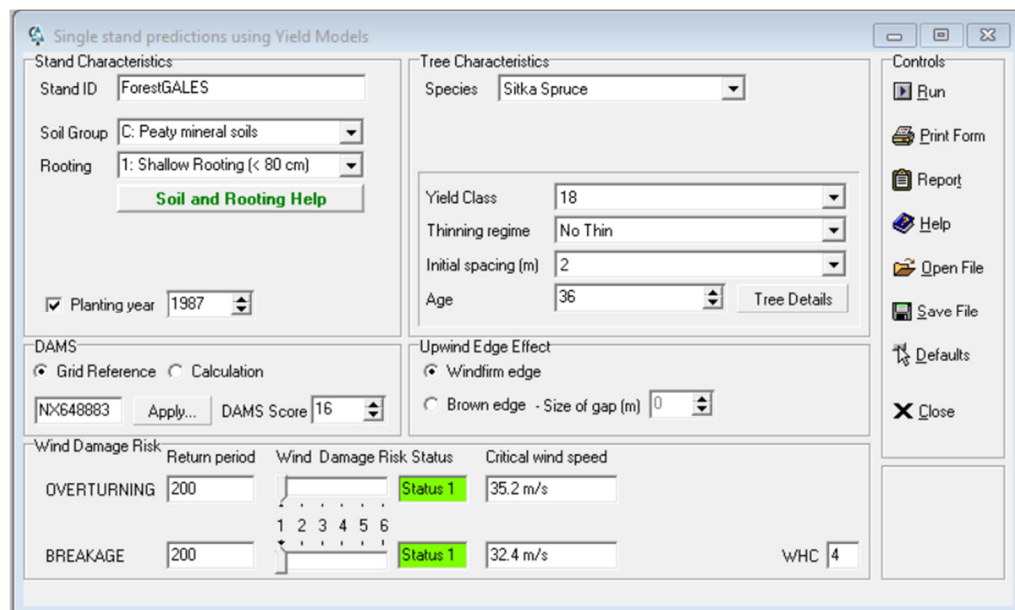
Other Areas

10.4.6 There would also be a relatively small amount of felling required to provide clear areas for the proposed temporary construction compounds, based on a 20 m x 20 m area.

10.4.7 On an operational basis, the landowner/forest manager may decide to clearfell all mature timber crop trees to the west and north of the proposed OHL route in compartments 7, 8 and 15 should there be no easy access for harvesting machinery such as forwarders under the live OHL once installed.

Windblow Impact

10.4.8 Wind Hazard Class (WHC) data could not be obtained from the compartment schedules. Therefore, UK Forest Research 'Forest Gales' software has been used to calculate WHC averaged across the study area plot positions. The figure below shows the Forest Gales analysis for compartment 15, as an example.



- 10.4.9 The average wind hazard class is 4 which is in the mid-range of wind damage risk. This means that the critical height before trees start to overturn or break in unthinned stands is 19 m. The top heights along the proposed OHL route and in the area of the proposed construction compound in compartment 2 ranged between 16.2 m and 26.5 m, with an average height of 20.5 m. The critical wind speeds that may initiate overturning is 35.2 m/s and breakage is at 32.4 m/s. The modelled return period for this to occur on these sites is 200 years. However, gales sufficient to cause windblow/breakage damage may occur at any time. The Detailed Aspect Method of Scoring DAMS score of 16 indicates that this is a moderately windy area.
- 10.4.10 Given that the average top height exceeds the critical height for WHC4 the probability of windblow and stem breakage is more likely once the proposed OHL route creates exposed brown edges. Therefore, trees would need to be felled back to a windfirm edge or more likely the edge of the compartment/sub-compartment boundary.
- 10.4.11 It should be noted that the south end of compartment 15a (location of compartment shown in Appendix 10.2) is already windblown. Removing the OHL wayleave would initiate further windblow on the southern edge of compartment 15a and 15b due to lack of windfirm edge between these areas. Therefore, it is suggested that this is clearfelled at the same time as the rest of the proposed felling (refer to Table 10.8 for how this affects the felling quantities).
- 10.4.12 In addition, the northmost sections of compartments 1b, 7a and 7b may be at increased risk of windblow if retained, once the wayleaves corridor is exposed due to the facing direction of the new exposed edge compared with the direction of the south westerly gales. Therefore, it would be recommended that these areas are clearfelled (refer to Table 10.8 for how this affects the felling quantities).

Harvesting Method and Utilisation of Timber

Forestry Operations

- 10.4.13 Forestry works would be conducted in line with the ‘Scottish Environment Protection Agency’s guidance note – Land Use Planning System’, as well as ‘SEPA’s Guidance Note LUPS-GU27 – Use of Trees Cleared to Facilitate Development on Afforested Land’.
- 10.4.14 The document states that the best practice for dealing with forest materials at development sites is as follows:
- Professional forester input to quantify the likely volume, markets, and economic uses of trees to be exported from the site;
 - Developer commitment to employ a professional forester to implement and maximise the removal of timber and forest residue on site;
 - Quantify the likely volumes of material for which no economic off-site use can be found; and
 - Identify if there are valid uses on site for material for which no economic off-site use can be found.
- 10.4.15 All forestry input in relation to the environmental appraisal of the proposed development is being provided by Wayne Scurrah, who is an Associate Member of the Institute of Chartered Foresters and has experience in providing forestry support for wind farms and other renewables developments.
- 10.4.16 However, the landowners’ forest agents would arrange and oversee the actual felling and utilisation of the timber.

Felling and Utilisation

- 10.4.17 The method of felling and utilisation at this site would be based on whole tree utilisation. All the timber and branchwood would be removed from site so there would minimal arisings left on site. Appendix 10.3 provides the work programme including felling areas and volumes. The method would be as indicated below.
- 10.4.18 A conventional harvester and forwarder would be used to fell and extract the timber from all felled areas. A forwarder would then be used to gather the brash. It would then be taken to roadside and put through a chipper which would chip all the brash which is blown in walking floor type trailer on an articulated lorry.
- 10.4.19 The round timber is likely to be sent to local timber markets for onward processing with the wood chip element being sold for biomass.

Clearance of Young Restock Crops

- 10.4.20 The clearance of young restock crops is likely to be carried out by mechanised mulching machinery reducing the cut residues to chipped mulch to below the base whorl of conifer plants. Chipped residues can be left to compost where they are cut as per current operational practices on peat restoration sites. Care would need to be taken to avoid chipped residues entering watercourses.

Waste Materials

- 10.4.21 Given the negligible quantities of forestry waste likely to be produced from the proposed felling, these impacts have not been considered. However, all waste materials would be managed in accordance with SEPA's guidance notes – Land Use Planning System, SEPA Guidance Note LUPS-GU27 – Use of Trees Cleared to Facilitate Development on Afforested Land and the SEPA (2017) Guidance WST-G-027 version 3 Management of Forestry Waste
- 10.4.22 Tree shelter tubes would need to be removed and recycled where young mixed broadleaved crops have been planted. This only occurs at the very southmost limit of the line entering the planted area at Glenshimmeroch Hill and on the western edge of the Sitka spruce crop at the Lochwhinnie Hill end. It would be necessary to spray with herbicide any coppice regeneration of the cut broadleaf trees to prevent regrowth in the 30 m wayleaves corridor.

Assessment of Effects

- 10.4.23 This section assesses the effect of the long term loss of forestry resource as a result of the felling of the required 'wayleave corridor'.
- 10.4.24 The total area of felling within the wayleave corridor is approximately 5.541 ha and approximately 5.51 ha of recently restocked land. The total amount of timber to be felled is 1,317 m³ (includes timber felled for infrastructure and windfirm edge) of timber prematurely cleared (see Figure 10.3 and Appendix 10.3). Permanent clearance of tree crops in the wayleave corridor would result in a loss of Net Present Value (NPV) for the landowner in perpetuity. The likely magnitude of impact is Minor given the area of permanent woodland loss is estimated at 2.4% of the conifer crop and taking in to account the scale of the size of the woodland resource.
- 10.4.25 The forestry that would be lost comprises woodland where change is a normal part of forestry management. The small area of broadleaves that would be affected does not provide public recreation and is not of local or national importance. The sensitivity of the forestry resources is Minor.
- 10.4.26 The likely effect on the local forestry resource is considered to be Minor.

Mitigation

Restocking and Compensatory Planting

- 10.4.27 SPEN does not propose any restocking of those areas required to be felled and kept clear of trees for the operational phase of the proposed development.
- 10.4.28 The following areas would require to be felled to accommodate the construction of the proposed development, but potentially be available for restocking:
- Areas outside the above initially cleared of forestry to a compartment boundary or to create a windfirm edge, to facilitate the construction of the proposed development.

- Areas cleared of trees for widening around bends and junctions for component delivery.
- Locations of temporary construction compounds.

10.4.29 The area that would be required for restocking is 11.44 ha which includes areas of mature timber, young recently restocked crops and one temporary compound in Troston Estate compartment 24. In line with the UKFS, Restocking could take the form of 10% open ground, 5% mixed broadleaves (including Sessile oak) 10% mixed conifers and 75% Sitka spruce.

Compensatory Planting

10.4.30 As the proposed development involves the permanent removal of woodland for the purposes of conversion to another type of land use, the Scottish Government's Policy on Control of Woodland Removal (2009) has been fully considered to establish whether Scottish Forestry would require an area of new woodland establishment to compensate for the area felled.

10.4.31 The Scottish Government's Control of Woodland Removal Policy (2009) states the following:

Woodland removal, without a requirement for compensatory planting, is most likely to be appropriate where it would contribute significantly to:

enhancing priority habitats and their connectivity;

enhancing populations of priority species;

enhancing nationally important landscapes, designated historic environments and geological Sites of Special Scientific Interest (SSSI);

improving conservation of water or soil resources; or

public safety."

10.4.32 Based on the above compensatory planting would be required for the proposed development. The need for compensatory planting would be in the areas removed for the wayleave corridor (30 m either side of the OHL). Therefore, the area for compensatory planting would be 11.25 ha. SPEN is committed to providing the necessary compensatory planting to mitigate the loss of forestry. There is scope for compensatory planting in the large areas of internal open ground with Glenshimmeroch Forest and Troston Estate. However this would be subject to provision of such land from landowners as SPEN are transmission licence holders only.

10.4.33 SPEN, as a transmission licence holder for Central and Southern Scotland, formally obtain access rights to infrastructure and individual connections for operation and maintenance purposes. As SPEN do not own or lease land in which OHLs or underground cables are placed, SPEN only has control over the safety and security of the line e.g. to ensure statutory safety clearances are maintained from trees, buildings and other natural and built features within the wayleave area for the line.

This therefore limits the ease with which compensatory planting could be located near to a site where infrastructure is located and SPEN are therefore reliant on working with third parties to secure land for compensatory planting on a voluntary basis. This differs from other types of developments, such as renewable generation, which can secure ownership rights for the land on which their apparatus is located, allowing for the delivery of biodiversity improvements or compensatory planting.

- 10.4.34 A fundamental policy that has been followed throughout in relation to the design of the proposed development has been to minimise the amount of permanent felling. This would ensure compliance with the Scottish Government's Policy on Control of Woodland Removal.
- 10.4.35 It is not considered that the proposed development would qualify for change of land use without compensatory planting, as it could not contribute significantly to any of the relevant criteria detailed in Appendix C of The Scottish Government's Policy on Control of Woodland Removal.
- 10.4.36 However, the proposed development would meet the acceptability criteria for woodland removal as the change of land use with compensatory planting would contribute significantly to "helping Scotland to adapt to climate change" by providing facilities appropriate for the development of renewable energy projects and significantly reduce net greenhouse gas emissions.
- 10.4.37 The following mitigation is committed to by SPEN:
- All forestry plans and operations would fully comply with the UK Forestry Standard (2017).
 - The plan to carry out linear felling and that to windfirm edges for the proposed OHL route would minimise the amount of felling required.
 - The access roads have been designed to minimise the amount of tree felling, utilising existing tracks wherever possible.
 - The extraction of the timber produce would be carried out after the access roads have been installed, so as all the felled trees would be very close to the access roads, most of the timber extraction would be carried out on the hard road and not over the bare ground. This would avoid/minimise any damage to the soil.
 - All felling would be carried out outside the bird nesting season, which is normally March to August. If this is not possible, a pre-felling inspection of vegetation to be cleared for nesting birds would be undertaken by an ornithologist no more than 24 hours prior to felling commencing.
 - Site refuelling and maintenance areas would be sited well away from watercourses and best practice measures would be taken to mitigate risks of spillages.
- 10.4.38 The maximum area of land that would need to be planted (the Scottish Forestry default position) is an area equivalent to the area being kept clear of trees, which in this case is estimated to be 11.25 ha (gross area).

A restoration plan to confirm the location and areas of compensatory planting would be agreed with the relevant landowners in advance of delivery. Should further areas for Compensatory Planting be required, once the area(s) for Compensatory Planting has been chosen, a full specification would be drawn up to include ground preparation, drainage, planting technique, stocking density, species, maintenance and protection.

10.5 Summary

- 10.5.1 This chapter has been prepared as part of the environmental appraisal and the Section 37 application for the proposed development.
- 10.5.2 The installation of the proposed OHL wayleave would result in the loss of local forestry resource due to the requirement for a 30 m wayleaves corridor either side of the proposed OHL (60 m in total) as well as new access tracks and temporary construction compounds. The proposed development has sought to minimise to a practicable level the amount of forestry felling required to accommodate the proposed development infrastructure.
- 10.5.3 As a result of the proposed development, based on the parameters adopted, up to 22.69 ha (gross area including areas lost to wayleaves, infrastructure and felling to windfirm edge) of forestry would require to be felled, and require compensatory planting of 11.25 ha (gross area including permanent loss of woodland for the wayleaves). A summary of impacts is provided in Table 10.9.

Table 10.9: Summary of Impacts

Receptor	Potential Impact	Mitigation	Residual Effect
Local forestry resource	Direct loss of forestry resource due to felling for the installation and operation of the proposed development	Compensatory planting	None
	Windblow	Restock planting of area up to windblown edge	None

10.6 References

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11.

**Traffic and
Transportation
Appraisal**

11 Traffic and Transportation Appraisal

11.1 Introduction

- 11.1.1 This chapter assesses potential effects of the proposed overhead line (OHL) on the highway network (in transport terms) and its users. This chapter should be read in conjunction with Chapter 4: Proposed Development.
- 11.1.2 The chapter describes the assessment methodology that has been adopted and identifies how baseline conditions have been established. The access, traffic and transport receptors have been identified within a defined assessment area (the 'study area') which has the potential to be adversely or positively impacted by the proposed development.
- 11.1.3 Potentially significant access, traffic and transport related environmental effects may result from import of general construction materials transported via 'conventional' heavy goods vehicles (HGVs) and low loaders.
- 11.1.4 The assessment detailed within this chapter includes worst case assumptions made for the purpose of forming a robust assessment of the proposed development within the parameters identified in Chapter 4: Proposed Development.
- 11.1.5 For a worst-case assessment, the following assumptions have been made:
- all construction materials are assumed to be sourced from off-site locations (i.e. outside of the application boundary), including all aggregate required for track construction, thus ensuring that the estimated level of trip generation is considered as a maximum worst case; and
 - future traffic increases associated with the construction of the proposed development have been measured against baseline flows with a low National Road Traffic Forecast (NRTF) growth factor applied.
- 11.1.6 An assessment has been made of the potential effects of the proposed development, with focus on the construction phase on the basis that this will have the greatest impact on the local transport network within the study area. Where required, mitigation measures have been defined to reduce adverse effects.
- 11.1.7 During operation, the proposed development would generate occasional maintenance trips, which would not lead to any variation in the baseline traffic flows beyond that of everyday fluctuation.

11.2 Methodology

Consultation

- 11.2.1 The Roads Planning Team of Dumfries and Galloway Council has been consulted on the content and methodology of the transport appraisal set out in this report. A formal response is awaited.

Scope of the Assessment

- 11.2.2 The below outlines the steps taken in the assessment to establish the effects on road users due to traffic associated with the construction of the proposed development:
- An assessment of the existing baseline conditions based on Department for Transport (DfT) traffic data and additional automatic traffic count data.
 - An assessment of the surrounding road network to determine its suitability to accommodate the anticipated volume of construction traffic e.g. HGVs.
 - An assessment of the increase in traffic compared to baseline traffic flows for the opening year of construction, which is assumed to be 2026, for the roads included in the study area, as shown on Figure 11.1. The approach for this has been to define the level of traffic anticipated to access the proposed development during its construction phase, calculated from first principles and distributed over an anticipated construction programme of ten months.
 - An assessment of operational traffic. This provides a brief summary of typical maintenance activities and the types of vehicles used as traffic impacts during the operation of the proposed development are minimal.

Study Area

- 11.2.3 The study area includes local roads that are likely to experience increased traffic flows resulting from the proposed development. The geographic scope was determined through the review of Ordnance Survey (OS) plans and an assessment of the potential origin locations of construction staff and supply locations for construction materials.
- 11.2.4 The study area will be situated among three wind farms which were at the following development stages at the time of writing of this report:
- Troston Loch Wind Farm (Orange on Figure 3.1):
 - An application (reference ECU00001785) for Section 36 consent under the Electricity Act 1989 was made for 14 wind turbines, 149.9 m tip, and was approved by the Energy Consents Unit (ECU) in December 2020.
 - Glenshimmeroch Wind Farm (Blue on Figure 3.1):
 - Planning permission was granted in September 2019 on appeal (PPA-170-2138) for ten turbines, 149.9 m to tip.

- o Further applications to extend the tip height have been made, with the most recent application (application reference 23/1686/S42) for tip height increase to 200 m and extension of operational life to 35 years, granted in December 2023.
 - Margree Wind Farm (Purple on Figure 3.1):
 - o Planning permission was granted in March 2022 on appeal (case reference PPA-170-2153) for 9 turbines (maximum tip height 200 m) (Dumfries and Galloway Council reference 20/2085/FUL).
- 11.2.5 Access for construction materials would be predominantly from the north via the A70 and A76.
- 11.2.6 Proposed access points for the proposed OHL route are detailed in Table 11.1 below.

Table 11.1: Proposed Access Points

Access Option	Road Name	Proposed Means of Access	Location (Lon./Lat.)
1	B729	Works access 1 is located off the south side of the B729, approximately 8.7 km (5.4 miles) west of Moniaive.	55.196666, -4.049031
2	U141S (1)	Works access 2 is located approximately 1.3 km (0.8 miles) south-west from the B729.	55.188926, -4.073043
3	C51S	Works access 3 is located at a private farm entrance off the north side of the C51S, approximately 4.1 km (2.5 miles) east from the B7000.	55.149023, -4.122974
4	U141S (2)	Works access 4 is located approximately 3.1 km (1.9 miles) south-west from the B729.	55.181401, -4.096103

11.2.7 The study area is focused only on the immediate roads surrounding and leading to the proposed development, as it is expected that traffic flows outside this area would be dissipated within the wider road network. This chapter therefore only considers the likely increases in traffic along these routes.

Cumulative Developments

11.2.8 In addition to the three wind farm developments comprised in the study area, there are two wind farm developments in various phases of planning in proximity to the proposed development. Each cumulative development may require further consideration in regard to associated construction/operation/decommissioning traffic impacts. Each development is detailed below:

- Divot Hill Wind Farm

- 23/0368/FUL FEB 2023 – Awaiting Decision – Application for the erection of wind farm consisting of 9 wind turbine generators (maximum blade tip height 200 m) with associated transformers, erection of substation and battery storage facility, formation of hard standing areas, access tracks, watercourse crossings, borrow pits, temporary construction compound and associated works.
- The proposed construction access route for the Divot Hill wind farm begins at the POE Clyde Port in Glasgow, following the A75, A713, B7075, A712 and A702 (to site access). (General Construction Traffic and AILs).
- Projected Construction date of 2025.
- The study area is as follows:
 - The A702 where access to the Proposed Development would be taken;
 - The B7075 between the A712 and the A702; and
 - The A712 between the A713 and the B7075 (very short section of less than 1km); and
 - The A713 between Carsphairn and St John’s Town of Dalry.
- Cornharrow Wind Farm
 - 22/2487/S42 – Appeal Submitted – Application for the erection of a wind farm comprising up to 7 wind turbine generators (maximum height up to 180 m) the formation of access tracks, borrow pits, temporary construction compound, battery storage, on-site substation, and all other associated infrastructure at variance with condition 12 of previously consented permission attached to 12/1766/S42 (Scottish Government Planning Appeal Permission Reference PPA-170-2145) to allow an increased micro siting allowance of 200 m (section 42).
 - Planning permission was granted for Cornharrow Wind Farm at appeal on 6 July 2022 (PPA170-2160). The consented wind farm comprises seven wind turbines with tip heights of up to 180 m, micrositing up to 100 m and associated infrastructure.
 - A further application has been made (23/1686/S42) in August 2023 seeking to increase the wind turbine tip height to 200 m and extend the wind farm operational life span to 35 years. This is currently under consideration.
 - This wind farm development also utilises the U141S Fingland Road as part of the abnormal loads transport route. Details on the proposed commencement of construction are not provided in the deposited planning information.
 - The study area considered in this assessment was as follows:
 - The B729, where access to the Proposed Development would be taken;

- The B7000 between the U140S and the B729;
 - The U140S, C51S and the U141S unclassified roads; and
 - The A713 between Carsphairn and Dalry.
- 11.2.9 Construction of Divot Hill Wind Farm is anticipated to commence in 2025 with a construction programme of 12 months. Therefore, it is expected that construction works would be complete before the proposed development works would commence or any potential programme overlap would be minimal. Divot Hill is therefore not considered any further in regard to cumulative development.
- 11.2.10 With Cornharrow Wind Farm still proceeding through the planning process it is anticipated that, at the earliest, construction may commence in 2025, with a 12-month construction programme. Therefore, it is expected that construction works would be complete before the proposed development works would commence or any potential programme overlap would be minimal. Cornharrow is therefore not considered any further in regard to cumulative development.

Information and Data Sources

- 11.2.11 To determine the baseline conditions against which the potential impacts of the proposed development have been assessed, data from the DfT website has been obtained on the DfT annual traffic statistics are accrued via continuous data from Automatic Traffic Counters (ATCs). The location of the existing ATCs is shown on Figure 11.2.
- 11.2.12 In addition to the above, road traffic collision data for the most recent five-year period from 2018 – 2022 was obtained from the DfT. The associated data on Personal Injury Accidents (PIA) is provided in Appendix 11.1.

Methodology

- 11.2.13 The proposed development was screened out from the requirement for an Environmental Impact Assessment, therefore the approach to this assessment is based upon Transport Scotland's 'Transport Assessment Guidance (2012)' (TAG). This assessment is based upon the change in total traffic flows or the change in HGV flows along a specific section of road.
- 11.2.14 Professional judgement must also be considered, particularly where the baseline traffic flow may be low and therefore a small percentage increase in traffic may result in a high relative percentage increase. In this case, the absolute value of change must be considered in the overall assessment of traffic impact.
- 11.2.15 Additionally, guidance has been applied from the National Evaluation from Surveys and Assignments (NESA) Manual (Highways England, 2015) to assess the maximum road capacity for each link within the study area over the assumed daily work hours. By considering the extent of road capacity utilised during a workday resulting from the proposed development against the total capacity of the given road in the study area, the traffic impact can be determined.

- 11.2.16 TAG guidance indicates that a day-to-day variation in traffic flow of plus or minus 10% is an acceptable threshold for use in determining the impact of development traffic. The guidance also acknowledges that a 10% increase on a lightly trafficked road may not pose an adverse impact, whereas a 1% increase on a congested motorway would be. In the former circumstance, the absolute value of change is considered to determine the impact on a road network.
- 11.2.17 Design team engineering information outputs have been used to predict traffic generated for the construction phase based on workers and HGV movements. This data has been compared to the DfT data to calculate the percentage change in traffic during the anticipated ten-month construction phase.

Assessment Assumptions and Limitations

- 11.2.18 The assessment has been undertaken based on the assumption that good construction practices would be employed, including the following:
- all vehicles delivering plant and materials to the site would be roadworthy, maintained and sheeted, as required;
 - suitable traffic management would be deployed for the movement of HGVs and other site traffic; and
 - HGV loads would be managed to ensure part-load deliveries would be minimised where possible, to limit the overall number of loads.
- 11.2.19 It is anticipated that the main construction hours for the proposed development would be Monday to Friday during daytime periods only, between 07.00 and 19.00 for felling and access installation in summer (April to September) and 07.30 to 17.00 (or as daylight allows) in winter (October to March) for all other activities unless otherwise agreed with Dumfries and Galloway Council. Certain activities, such as electrical works or pole erection in the event of delays due to unfavourable weather conditions, may require to be undertaken outside these hours. Construction hours generally also apply to the delivery of materials to the proposed development.
- 11.2.20 The assessment is based upon an assumed construction programme for the proposed development and is based upon average traffic flows. There may be localised peaks with construction days where flows can be higher for a specific hour, such as shift change on site.
- 11.2.21 Assumption on the origin points for materials have been made to provide a worst-case assessment scenario.

11.3 Existing Environment

Baseline Traffic Surveys

- 11.3.1 Access to the proposed OHL route would be taken from the B729 and B7000 via an A76 (east) and A713 (west). At which the B729 comprises the works access 1, linking east-west to the UI41S which comprises works access 2 and 3, and the B7000, which follows east-west to the C51S, comprising of works access Option 4. Location of the proposed access points is shown on Figure 11.1.

- 11.3.2 The A76(T) is the main trunk road in the area and connects A70 and the A702(T) in Thornhill via the B732 and is operated by Transport Scotland. Within the study area generally, and in the vicinity of the proposed OHL route, the road is subject to the national speed limit of 60 mph.
- 11.3.3 In order to assess the impact of development traffic on the study area, Annual Average Daily Traffic (AADT) flows were obtained from the DfT traffic database.
- 11.3.4 The counts sites used were as follows:
- 20877 – A702 (south-east of Holmhead)
 - 408878 – A702 (east of St. John’s Town of Dalry)
 - 804865 – B7000 (east of Knowehead)
 - 990182 – B729 (west of Craigdarroch)
 - 811491 – B7000 (south of Dalry)
- 11.3.5 The locations of the traffic count sites used in this assessment are illustrated in Figure 11.2. The DfT traffic data allows the traffic flows to be split in vehicle classes. The data were summarised into All Vehicles and HGVs (all goods vehicles > 3.5 tonnes gross maximum weight).
- 11.3.6 Table 11.2 summarises the AADT traffic data collected and used in this assessment. Data for count points 20877, 40878 and 804865 was obtained for 2022 and for count points 990182 and 811491 was obtained for 2019.

Table 11.2: Existing Annual Average Daily Traffic (AADT) Traffic Conditions

Count Point ID (Road)	HGVs	All Vehicles	% HGV
20877 (A702 Holmhead)	19	236	8.05
40878 (A702 St John’s)	18	219	8.22
804865 (B7000 Knowehead)	4	95	4.21
990182 (B729 Craigdarroch)	1	126	0.79
811491 (B7000 Dalry)	10	168	5.95

Baseline Road Safety Review

- 11.3.7 Personal Injury Accident (PIA) data covering the study area was obtained from the DfT (available at <https://www.gov.uk/government/collections/road-accidents-and-safety-statistics>) for the five-year period between 2018 and 2022 (inclusive), which relates to the most recent period of available data. The PIA accident data revealed that there have been no recorded accidents in the vicinity of the proposed development. The associated PIA reports are provided Appendix 11.1.

Future Baseline

- 11.3.8 Construction of the proposed development is anticipated to commence during 2026 if consent is granted and is anticipated to take up to 10 months depending on weather conditions and ecological considerations.
- 11.3.9 To assess the likely effects during construction, base construction year traffic flows were determined by applying a NRTF low growth factor to the surveyed traffic flows. The NRTF low growth factor for 2019 to 2026 is 1.043 and for 2022 to 2026 is 1.021. These factors were applied to estimate the 2026 base traffic flows shown in Table 11.3. This is used in the construction peak traffic impact assessment.

Table 11.3: Estimated Baseline 2026 Traffic Flows

Count Point ID (Road)	HGVs	All Vehicles	% HGV
20877 (A702 Holmhead)	19	241	8.05
40878 (A702 St John's)	18	224	8.22
804865 (B7000 Knowehead)	4	97	4.21
990182 (B729 Craigdarroch)	1	131	0.79
811491 (B7000 Dalry)	10	175	5.95

- 11.3.10 In the scenario that the proposed development did not proceed; traffic growth estimated in Table 11.3 would still occur.

11.4 Predicted Impacts and Mitigation

Proposed Development Parameters – Traffic and Transport

- 11.4.1 The precise quantities of construction materials required for the proposed development are subject to change and, in this assessment, are based on a worst-case scenario assumption for robustness.

Traffic Generation

LGV Trip Generation

- 11.4.2 Light Goods Vehicles (LGVs) (i.e., smaller vehicles such as cars and vans, which would typically be associated with transporting the workforce to/from the site) have been calculated to provide total two-way vehicle movements predicted to arise from the proposed development.
- 11.4.3 At peak, LGV trips would be generated by approximately 20 workers who would be working on the site during the construction phase, with a maximum of 20 two-way movements daily, based on 2 workers per car occupancy.

HGV Trip Generation

- 11.4.4 Heavy Goods Vehicles (HGVs) (i.e., larger vehicles such as articulated lorries, which would typically be associated with the transportation of equipment and materials to/from the site) have been calculated to provide total two-way vehicle movements predicted to arise from the proposed development.
- 11.4.5 At peak, HGV trips would average 8 two-way movements daily during the construction phase, with a maximum of 16 two-way movements daily in months 9 and 10.

Construction Programme

- 11.4.6 The two-way movements for HGVs have been distributed over the anticipated 10-month construction programme, according to the relevant construction activity. The total two-way trip generation has been divided by the number of operational days in each month (20 in any one month), to provide a daily two-way trip generation. The construction programme is summarised in Table 11.4.

Table 11.4: Construction Programme

Activity	2026		2027								Total
	Nov (1)	Dec (2)	Jan (3)	Feb (4)	Mar (5)	Apr (6)	May (7)	Jun (8)	Jul (9)	Aug (10)	
Site mobilisation / Demobilisation	16									16	32
Main compound to work area movements during main works		320	320	320	320	320	320	320	320		2560
Access tracks & compound	178	178	60	60	60	60			300	300	1197
Cabling							2	2			4
Pole Deliveries		10									10
Main compound to work area Pole Deliveries		2	2	2	2	2	2	2	2		16
Staff and visitors	400	408	408	408	408	408	408	408	408	400	4064
Total All Vehicles per month	596	918	472	472	472	472	412	412	710	716	5652
Daily average (all Veh)	30	46	24	24	24	24	22	22	36	36	288
Total HGV per month	194	190	62	62	62	62	4	4	302	316	1259
Daily average (HGV)	10	10	4	4	4	4	2	2	16	16	72

Trip Generation Summary

- 11.4.7 These figures have been calculated to give a daily flow. The results of these calculations are as follows:
- Average number of worker movements over the construction programme = 20 p/d two-way.
 - Average number of HGV movements over the construction programme = 8 p/d two-way, peaking at 14 p/d two-way during site mobilisation/enabling works and demobilisation (Months 1, 2, 9 and 10 of the programme).

Construction Impacts

- 11.4.8 The rural nature of the road network surrounding the proposed OHL route is factored into the construction traffic impacts, and as such, a specific HGV route has been developed. It is possible to assess the likely impact of construction traffic along this route by comparing the baseline traffic data with the construction traffic data.
- 11.4.9 Vehicle movements have been distributed on the surrounding external road network assuming an equal weighting in terms of use based on potential location of worker trip origins (home) and construction material provider.
- 11.4.10 Table 11.5 also displays the road capacity for each link in the study area based on NESAs Manual guidance and the expected level of spare capacity with the addition of the estimated construction traffic flows. The TAG document provides that where assessed roads have an exceptionally low level of traffic (e.g. rural, low trafficked unclassified roads), then increases in traffic as a result of the development may be expressed as an 'absolute value' (e.g. number of vehicles per day). In this case, absolute value has been considered, in addition to the road capacity and level of spare road capacity of each link within the study area, to determine the impact of the development traffic.
- 11.4.11 The road capacity displayed for each link in Table 11.5 is based on a shorter, winter work hour schedule (07:30-17:00) (9.5hrs) as a robust (worst case) assessment of impact. The projected increase in traffic flow along the proposed HGV route is summarised in Table 11.5.

Table 11.5: Construction Traffic Impact

Count Point ID (Road)	Total HGVs	Total All Vehicles	HGV Change	All Vehicles Change	Road Capacity (Vehicles)	Spare Capacity (Including Development Traffic)
20877 (A702 Holmhead)	19 (+8)	241 (+30)	41%	12%	11400	97.6%
40878 (A702 St John's)	18 (+8)	224 (+30)	44%	13%	11400	97.8%
804865 (B7000 Knowe-head)	4 (+8)	97 (+30)	196%	31%	7600	98.3%
990182 (B729 Craigdarroch)	1 (+8)	131 (+30)	767%	23%	7600	97.9%
811491 (B7000 Dalry)	10 (+8)	175 (+30)	77%	17%	7600	97.3%

11.4.12 All count points exhibit a percentage increase of more than 10% in both total traffic and HGV, meaning further assessment is required for these locations.

11.4.13 It should be noted that in terms of total vehicles, the link with the greatest percentage increase would only utilise approximately 0.4% of maximum available road capacity over a period of 9.5hrs (winter working hours). Additionally, the link with the highest change in HGV volume of traffic (990182) would only utilise approximately 0.4% of maximum available road capacity over a period of 9.5hrs (winter working hours).

11.4.14 In relative terms the increase in HGV movements by 767% equates to additional 8 vehicles per day which equates to less than 1 HGV per hour.

Mitigation

11.4.15 Although there is no discernible effect on the strategic network as a result of the construction stage, a construction traffic management plan (CTMP) would be developed to ensure that HGVs only use appropriate routes to access the proposed OHL route.

11.4.16 In addition to traffic management measures, where there are likely to be impacts to non-motorised users, such as public rights of way crossing access routes, additional signage would be erected to raise awareness for both users and drivers of vehicles. Signage would be erected at the start and end of each road being used by construction traffic to highlight the use by HGVs.

Operation Impacts

11.4.17 The operational stage of the project would not lead to any significant increase in traffic compared to existing levels.

Decommissioning Impacts

11.4.18 Decommissioning of the proposed development is likely to comprise a reversal of the construction activities and any effects would not be greater than that resulting from its construction and therefore has been scope out of assessment.

11.5 Summary

11.5.1 This assessment provides a summary of the likely increase in traffic flows during the construction and operational periods of the proposed development. Utilising existing traffic data and estimated construction traffic data, it is considered the proposed development would have a negligible effect on the local road network.

11.5.2 A number of traffic management measures are available to mitigate the impact of construction traffic during the 10-month construction programme, which would be adequately secured through a CTMP.

11.5.3 The existing road network has sufficient capacity to overcome any concerns raised over temporary increases in HGV and non-HGV construction traffic movements generated during the construction period. On the above basis, the proposed development is acceptable from a transport and access perspective.

Table 11.6: Summary of Impacts

Link	Potential Impact	Mitigation	Residual Effect
A702 Holmhead	Negligible	CTMP	Negligible
A702 St John's	Negligible	CTMP	Negligible
B7000 Knowehead	Negligible	CTMP	Negligible
B729 Craigdarroch	Negligible	CTMP	Negligible
B7000 Dalry	Negligible	CTMP	Negligible

11.6 References

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