Scottish & Southern Electricity Networks

Spittal to Loch Buidhe to Beauly 400 kV OHL Connection

Environmental Impact Assessment

Volume 5, Appendix 13.1 – E:

Woodland Reports

Welbeck Estate

July 2025

Contents

1. Introduction

1.1 Scottish and Southern Electricity Networks (SSEN) Transmission, hereafter referred to as 'the Applicant', owns, operates, develops and maintains the high voltage electricity transmission system in the north of Scotland and the Scottish islands. Due to the growth in renewable electricity generation in the north and north-east of Scotland, upgrade of the transmission network is required to provide the necessary increase in transmission capacity. The Applicant is applying for consent under Section 37 of the Electricity Act 1989 to construct and operate a new double circuit 400 (kilovolt) kV overhead line (OHL).

1.2 This report provides an assessment of woodland impact related to the Spittal to Loch Buidhe to Beauly 400 kV OHL Connection project (the 'Proposed Development'). The report details the woodland area affected by the Operational Corridor (OC), new access tracks (permanent), and additional felling required due to windblow risk within individual ownerships. It also includes mitigation considerations and compensatory planting recommendations.

2. Purpose of this Woodland Report

2.1 As part of the Environmental Impact Assessment (EIA) process, it was identified that construction of the OHL and associated access tracks would cross a number of woodland areas within both public and private landholdings. The landholding property boundaries are identified in **Figure 1: Woodland Impacted by the Proposed Development**.

2.2 This document provides an assessment of the woodland areas that are affected by the Proposed Development, including the requirement for woodland removal and management recommendations to mitigate the impact of the woodland removal.

2.3 Field surveys of the woodland areas have been undertaken and have been used to determine the various woodland characteristics to identify the woodland removal required and recommended. This document also sets out the area, in hectares (ha), of compensatory planting required to ensure no net loss of woodland is achieved.

3. Woodland Property

3.1 Welbeck Estate encompasses woodland and moorland, stretching from approximately 4 km north of Helmsdale to 2 km north of Berriedale along the northeast coast.

3.2 The woodlands within the estate affected by the Proposed Development consist of both coniferous and broadleaved woodland types. Central point grid reference is ND 09578 21991.

3.3 These woodlands are distributed across different areas within the estate but are generally aligned parallel to the east coast of the North Sea.

3.4 Two main designations are found within this ownership, where some woodlands are also present. These are the Special Site of Scientific Interest (SSSI) for Berriedale Water and Langwell Water, classified for their biological interest of the nationally important Upland Birch Woodland habitat.

3.5 The estate has, generally, an extensive and well-maintained network of tracks covering the entire property, providing access to both the moorland and some woodland areas. Refer to **Figure 1: Woodland Impacted by the Proposed Development.**

4. Development Requirements

4.1 400 kV Operational Corridor

4.1.1 With reference to **Figure 1: Woodland Impacted by the Proposed Development,** the Overhead Line (OHL) sections relevant to Welbeck Estate extend from Tower N103 to 50 m north of Tower N136.

4.1.2 The Study Area for this assessment is based around an OC of 90 m. The Applicant defines the OC as the area in which it has rights to remove woodland for the purposes of creation of new OHL, resilience and maintenance of OHLs, or protection of electrical plant as required by the Electricity Safety, Quality and Continuity Regulations (ESQCR) 2002 regulations and The Electricity Act 1989. The OC is defined as to the distance at which a tree could fall and cause damage to the OHL, resulting in a supply outage. As a result, the final OC width would be based on the safety distance required from the OHL centreline to allow for a mature tree falling towards the OHL, taking account of topography and tree height at maturity.

4.1.3 The OC width that has been assessed and identified for the safe build and energisation of the new OHL through areas of conifer woodland is 90 m (45 m either side of the OHL centreline). Further details can be found in **Section 13.3** of **Volume 2, Chapter 13: Forestry** which outlines the extent of the study area.

4.1.4 The OC width that has been assessed and identified for the safe build and energisation of the OHL through the areas of broadleaves is also 90 m (45 m either side of the OHL centreline). This has been assessed as a maximum OC width required at these woodland locations, with the potential of further narrowing of the OC prior to construction to allow greater tree retention depending on factors such as tree height, topography, crown reduction or other mitigation strategies[1].

[1]As specified by the 'Red Zone' set out in paragraph 41 of the Forest Industry Safety Accord. (2020) Safety Guide 804 Electricity at Work: Forestry. [pdf] Available at: FISA 804 (ukfisa.com).

4.2 Access Track Route Design

4.2.1 An existing infrastructure network within the property provides access to various areas of the woodlands and is in proximity to the Proposed Development features; however, new sections of both temporary and permanent roads will be constructed within and outside the OC. These roads will serve as the primary vehicle access route for the Proposed Development, as illustrated in **Figure 1: Woodland Impacted by the Proposed Development**, and will undergo maintenance and upgrades as part of the construction scope.

4.2.2 New access tracks, also detailed in **Figure 1: Woodland Impacted by the Proposed Development**, will be built to service Towers N103 to N135.

4.2.3 The access track corridor width required for clearing through the woodland is 20 m (10 m on either side of the centreline), but this will be evaluated in situ to determine the suitability for further tree retention.

4.2.4 The construction of these new access tracks will increase the impact of woodland removal along routes located outside the OC. The affected woodland along the new roadways will consist of a similar composition to that found within the OC, featuring a combination of coniferous plantations and broadleaved woodlands, depending on the specific location of the roads. Refer to **Table 9.1** below.

4.2.5 Tree felling, stump removal and residue mulching will be required for the installation of new access tracks and at each tower location for the formation of temporary construction working areas.

4.2.6 These roads will serve as the main arterial construction route. Tree felling and timber extraction will be able to utilise existing tracks, prior to any construction activity.

4.2.7 Where existing tracks require maintenance or upgrading, this may involve the removal of trees and scrub to facilitate the works, particularly to accommodate the creation of additional passing places. While much of the upgrade activity would fall within standard forest access maintenance, which typically involves the removal of scrub, regeneration, and crown management, some sections may require additional tree clearance within a corridor of up to 12 m in width.

5. Woodland Characteristics

5.1 A desk-based study of the woodland areas was conducted, to identify current woodland environmental designations and classifications.

5.2 The web-based data provided by Scottish Forestry and referencing the Scottish Government's Ancient Woodland Inventory (AWI), and

- The Scottish Forestry Map Viewer provides spatial data on the Native Woodland Survey of Scotland (NWSS) and classifies the woodland types into four categories[2] [3]:

1. Native woodland
2. Nearly-native woodland
3. Open land habitat
4. Plantations on Ancient Woodland Sites (PAWS)

5.3 The OC passes through coniferous plantations and broadleaved woodlands. While the majority of conifer woodlands within the estate do not hold any classification, the broadleaved woodlands are classified as Ancient Woodland Site of Semi-Natural Origin (AWSNO) (1a-1750) or Native Woodlands, located along the riparian banks of Langwell Water and Berriedale Water.

5.4 AWSNO classifications fall under the Ancient Woodland Inventory (AWI), while Native Woodland classifications are identified through the Native Woodland Survey of Scotland (NWSS).

5.5 Broadleaved woodlands affected by the Proposed Development at Welbeck Estate are also classified as Native Woodlands. These Native Woodlands are of the upland birchwood type and are encountered within the designated AWSNO sites and also within nearby broadleaved woodland blocks impacted by the OC. Refer to **Table 5.1**.

5.6 A small area of conifer woodland falls within the classification of Long-Established Woodland of Plantation Origin (LEPO) under the AWI.

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[2] Scottish Forestry Map Viewer URL https://scottishforestry.maps.arcgis.com/apps/webappviewer/index.html?id=0d6125cfe892439ab0e5d0b74d9acc18

[3] Scottish Forestry Native Woodland Survey of Scotland: Glossary of Terms; URL: Main Title (forestry.gov.scot)
Native Woodland – woods where the canopy cover is composed mainly of native species (i.e., over 50%).
Nearly Native Woodland - where native species make up between 40% and 50% of the canopy. These are woods that could have potential to be converted into native woodlands by altering their species mix.
Open Land Habitat – areas with <20% canopy cover of trees and shrubs adjoining a native woodland.
PAWS - Plantation on Ancient Woodland Sites. These are surveyed in the NWSS where they are recorded in the Scottish ancient woodland inventory (SAWI). These woodlands appear to have originated through natural regeneration sometime before the mid-19th century, but were later converted to planted wood.

Table 5.1: Woodland Designations			
Item	**Type of Impact**	**Woodland Designations**	**Area (ha)**
Operational corridor	Permanent	AWI- AWSNO (1a)	3.65
		NWSS- Native woodland	3.75
Access track corridor	Permanent	LEPO	0.05

5.7 Woodlands classified as AWSNO (1a) are present along the edges of the main watercourses within the estate that intersect the OC—Langwell Water and Berriedale Water. Refer to **Plate 1**. These woodlands are also classified as Native Woodland of the upland birchwood type. While dominated by semi-mature and pole-stage birch species, they also contain willow shrubs and rowan in smaller numbers. Refer to **Plate 2**.

5.8 Within the areas designated as SSSI under the Berriedale and Langwell Water, approximately 3.65 ha of birch woodland fall within the Proposed Development's OC. Refer to **Plates 3 and 4.**

5.9 Trees in these woodlands average 4.5 m in height and form scattered clumps throughout the classified areas. The woodlands are characterised by an open upper canopy with frequent gaps where heavy bracken dominates the understorey. Some historical evidence of natural regeneration is observed, but it is not significant. To protect these areas from deer browsing, fences have been erected.

Plate 1- AWSNO (1a) and Native Woodland along the southern side of Berriedale Water, also designated as an SSSI. Semi-mature and pole-stage immature trees coexist on a steep slope with patches of dense bracken and large boulders in the understorey. Grid reference: ND 10818 23543.

Plate 2- AWSNO and Native Woodland sites. The Native Woodland classification applies to all woodland north of Berriedale Burn, while the AWSNO classification applies to the woodland in the central and left woodland blocks observed in the photograph. Grid reference: ND 10908 23630.

Plate 3- Native Woodland and AWSNO along the sides of Langwell Burn, also designated as an SSSI. The photograph is taken from the southern side of the watercourse, where AWSNO and Native Woodland upland birchwood are present, looking north toward the plateau above the burn bank, where the Native Woodland classified area is observed in the background. Grid reference Native Woodland: ND 09591 22427.

Plate 4- AWSNO and Native Woodland sites are located at the southern edge of Langwell Burn. These trees share characteristics with other Ancient Woodland sites within the estate, featuring an open canopy; however, a higher presence of younger, pole-stage trees is more noticeable here. The trees are more sparsely distributed on the flatter ground, with scattered willow in very wet areas and occasional pine regeneration in drier open gaps. Grid reference: ND 09517 22196.

5.10 A small area classified as LEPO (0.05 ha) is located at grid reference ND 09893 22412, on the edge of a standing Scots pine plantation coupe at the semi-mature stage. A proposed new road will affect this small section of the conifer plantation.

5.11 The estate also contains woodlands that are not classified, which present different characteristics: young mixed plantations of conifer and broadleaved species, and a commercially managed semi-mature conifer plantation.

5.12 A mix of conifer species, with spruce and pine as main conifer species, along with broadleaved trees, mainly birch and some rowan, has been recently restocked on a previously felled conifer woodland. The newly planted trees are only a few months old and exhibit significant establishment failure rates throughout the plantation. Within this recently restocked site, a small patch of semi-mature conifer trees has been retained within the OC. Refer to **Plate 5**.

Plate 5- Recently restocked site with a mix of conifer and broadleaved species replanted throughout. Within the OC, a small area of retained conifer trees is observed on the top of the knoll at grid reference ND 09411 21860.

5.13 A small young plantation is located between the Ancient Woodland site on the south side of Langwell Burn and the recently restocked site. This area consists of a mixed plantation of young, pole-immature Scots pine and broadleaved species. Trees average 2.5 m in height and are primarily found on higher ground. The understorey is dominated by heavy bracken, covering the woodland floor. Refer to **Plate 6**.

Plate 6- Young conifer and broadleaved mixed plantation with sparsely distributed trees of an intimate species mix. Trees average 2 m in height. Grid reference: ND 09457 22071.

5.14 The semi-mature conifer woodland blocks, managed commercially, contain trees reaching financial maturity. This conifer woodland consists of a mixed plantation, with the main species being spruce and Lodgepole pine, averaging 19 m in height. Within the stand, a dark and undeveloped understorey is present. The trees have not been previously thinned, resulting in a dense upper canopy. The edges of these conifer plantations show some regeneration of the same species, as well as in open woodland rides. Refer to **Plate 7**.

5.15 A few broadleaved trees are occasionally found at the edges of the conifer block in open spaces.

Plate 7- Conifer plantation block of commercially mature spruce and Lodgepole mix tree species. The trees average 19 m in height. Regeneration is observed on the edges of the conifer blocks. Grid reference: ND 07187 20708.

5.16 A small area of clear-felled woodland is also present within the OC. This area was previously a conifer block and underwent felling operations in 2018. Grid reference: ND 06196 20494.

5.17 The site soils are predominantly peaty gleyed podzols.[4]

[4] Scottish Government's Scotland's soils website https://soils.environment.gov.scot

6. Windblow Risk Impact

6.1 An assessment was undertaken of the risk of windblow to areas of woodland adjacent to the OC which would be exposed due to the tree clearance required for the OC. This assessment was based on the professional judgement of the forestry surveyor with consideration being given to the soil and moisture regime, the topography, tree species, top height, exposure, altitude and aspect in relation to the prevailing wind direction and any previous management regimes. This assessment was also based on site visits and observations, and available data of the site. Reference was also made to Forest GALES 2.5 Forest Research decision support system where appropriate. Felling outwith the OC to a windfirm boundary is termed Management Felling and is presented within **Figure 1: Woodland Impacted by the Proposed Development.**

6.2 Given the nature of some of the woodlands, those of semi-mature unthinned conifer stands of an average height of 19 m and the local characteristics of soils, topography and aspect, it is anticipated that the introduction of the OC will result in future windblow to the adjoining woods. Refer to **Table 9.1**.

6.3 The woodland site affected by the Proposed Development has a 'Detailed Aspect Method of Scoring' (DAMS)[5] windthrow hazard class score of 16, classified as moderately exposed. The site presents mineral soils with shallow rooting that are mostly cool and moist.

6.4 Management felling is proposed to the areas adjacent to the OC and the access track corridors to minimize the future risk of windblow. However, certain areas within the woodland contain more open coupes, which are likely to remain wind-stable. These rather open coupes have been assessed and are therefore considered stable in the current conditions.

6.5 While management felling is proposed by the Applicant as part of sound forestry practice, the decision to implement such operations ultimately rests with the forest owner, who must align any felling activities with their broader forest management plans and objectives. Felling permission for these areas must be obtained by the landowner through an application to Scottish Forestry. As part of this regulatory process, Scottish Forestry will consider the appropriateness of the proposed felling and will attach conditions requiring the restocking of felled areas to ensure continued sustainable forest management

7. Woodland Management Impact

7.1 The OHL will create additional challenges for the future management of the forest as it dissects existing management coupes and introduces an electrical

[5] Detailed Aspect method of Scoring (DAMS) Ref. Forest Research, "Forest Gales software programme" and Forestry Commission Leaflet 85 "Windthrow Hazard Classification"

hazard. The risks associated with the electrical hazard will be reduced by regular maintenance of the OC, so maintaining the compliance of the OC and reducing any need for future tree clearance operations within the "Red Zone".[6]

7.2 The sterilisation of the OC, however, will have an impact on forest restructuring, potentially impacting the landowner's ability to utilise the forest's commercial viability in accordance with the UK Forestry Standard. Mitigation opportunities are discussed in the following **Section 8**.

7.3 The OHL will cross the woodland road network at either approximately 45 or 90 degrees and will be built to the regulatory safe height clearances above forest access tracks, which will reduce the hazard in respect of future timber haulage. It may still, however, impact on machine operations within the proximity of the OHL, such as stacking and loading. Mitigation of which could be incorporated into the access design, following discussions with the landowner.

7.4 The OHL may be restrictive to future in-forest machinery access. The requirement for dedicated forestry machine OHL crossing points will be discussed with the landowner and if required, will be identified once the OHL has been constructed, thus providing a safe OHL crossing point(s) for future working within the woodland.

7.5 The impact of the Proposed Development on the overall viability and continuity of woodland management has been considered. The affected woodland is part of a larger estate comprising semi-natural broadleaved woodlands and commercial conifer plantations. While the proposed OC intersects several woodland compartments, it is not expected to hinder the implementation of forest operations or ongoing management activities. The OC crosses central areas of the woodland where new access infrastructure is planned, which will in turn, improve accessibility to these compartments and support continued operational use. As such, no significant fragmentation or isolation of woodland units is anticipated, and the Proposed Development is not expected to materially affect the viability of current or future woodland management.

7.6 The impacts arising from the Proposed Development are not anticipated to affect the wider woodland management regime, nor are they expected to necessitate any alteration to the current or planned species composition.

8. Mitigation Opportunities

8.1 Mitigation to reduce the extent of tree felling within the OC will be considered and incorporated in areas of broadleaved woodlands as part of the proposal. This will consider specifically the broadleaf woodland areas associated with the woodland classified as AWSNO and Native Woodland at the edges of

[6] As specified by the 'Red Zone' set out in paragraph 41 of the Forest Industry Safety Accord (FISA) Safety Guide 804. Electricity at Work: Forestry (2020) FISA 804 (ukfisa.com)

Langwell and Berriedale watercourses. The Applicant will be using a process of 'managed resilience' which will seek to retain naturally regenerated broadleaved trees and shrubs as close as possible to the line to keep as much tree cover as possible. Smaller and lower growing tree species and shrubs can be retained closer to the OHL. OHL vegetation maintenance would take place on a 4-yearly cycle as required.

8.2 Impacts on woodland restock opportunities, resulting from the OC sterilisation, could be addressed through the amendment of the Felling Licence Application or the Long-Term Forest Plan (LTFP), adhered to the regulations of the Forestry and Land Management (Scotland) Act 2018, and in line with the UK Forestry Standard guidance to utilise wayleave corridors as designed Open Ground, repurposing currently unplanted areas to maintain the commercial productivity of the woodland.

8.3 Before the construction phase, these areas, along with access tracks, will be assessed for selective felling and also crown reduction to determine if greater tree retention is feasible. The final extent of tree retention will depend on the requirements of the Proposed Development, particularly ensuring the safety of OHL wiring operations during construction.

8.4 The permanent loss of 3.65 ha of native broadleaved woodland within Welbeck Estate, although impacted as designated upland birch woodland part of the SSSI, is not considered significant in terms of overall habitat availability. This area accounts for less than 1.8% of the total native woodland within the designated site within the Berriedale Water and Langwell Water SSSI.

8.5 The OC woodland removal area is required for the construction and operation of the new OHL infrastructure. Opportunities will be assessed for encouraging woodland regeneration within the OC, the identification of suitable areas cannot be guaranteed due to the requirement of maintaining the safe energisation of the OHL. Reference to **Tables 9.2 and 9.3** below, will fully mitigate the loss of forest resource within the OC through compensatory planting of the equivalent area (ha) of woodland removed.

8.6 Impacts on tree windfirm stability within the remaining crop have been assessed and considered as noted in **Section 6**. Woodland loss and management felling have been minimised through retention of crops identified as likely to be windfirm.

8.7 Impact of stability within the remaining crop has been assessed and reported on above.

9 Woodland Removal Impact

Table 9.1: Woodland Removal for Infrastructure

Item	Type of Infrastructure	Woodland type	Area (ha)
Operational corridor	Permanent	Conifer woodland	6.37
		Broadleaved woodland	4.65
		Felled (Conifer woodland)	0.75
Access track corridor	Permanent	Conifer woodland	1.85
	Temporary	Conifer woodland	1.11
		Broadleaved woodland	0.07

Table 9.2: Compensatory planting		
Compensatory Planting Area		14.80

Table 9.3: Woodland Removal Impact of Infrastructure		
Item	**Woodland type**	
Total Loss of Woodland Area	Conifer woodland	10.08
	Broadleaved woodland	4.72
Total Compensatory Planting Area off-site	Conifer woodland	8.97
	Broadleaved woodland	4.65
Total Restocking/ Replanting Area on-site	Conifer woodland	1.11
	Broadleaved woodland	0.07
Total Net Loss of Woodland Area		**0**

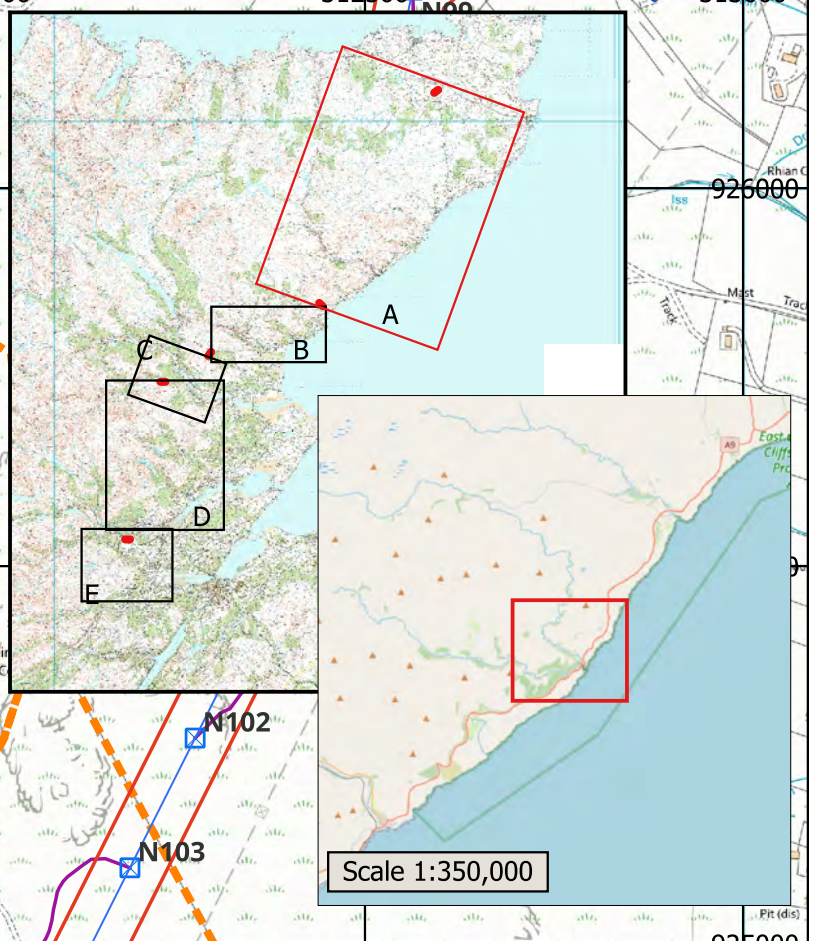
Table 9.4: Woodland Removal for Management Felling			
Item	**Type of impact**	**Woodland type**	**Area (ha)**
Management Felling	Temporary	Conifer woodland	5.19
Replanting / Restocking	Adhere to the Forestry and Land Management (Scotland) Act 2018.	Conifer woodland	5.19
Net Loss of Woodland Area			0
Note: Felling approval is via the Scottish Forestry Felling Licence Application process or Long-Term Forest Plan application or amendments process.			

10. Compensatory Planting

10.1 Compensatory planting to achieve the area quantity (ha) of woodland removal as a result of the Proposed Development will be in accordance with the Scottish Government's Control of Woodland Removal Policy of no net loss of woodland. A compensatory planting strategy is set out in **Volume 5, Appendix 13.3: Compensatory Planting Strategy.**

Scottish & Southern Electricity Networks

TRANSMISSION



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N

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Legend

- Landownership boundary/parcel
- Operational Corridor
- Central line Operational Corridor
- Proposed 400kV OHL Towers
- Access Tracks- Existing Upgrade
- Access Tracks- New Stone Perm
- Access Tracks- New Stone Temp
- Broadleaved woodland- Operational Corridor 90m
- NWSS- Native woodland

Woodland report
Project No- LT000132
Spittal- Loch Buidhe - Beauly 400kV Connection
Figure 1. Woodland Impacted by the Proposed Development
Section A- Welbeck Estate
1 Out of 3

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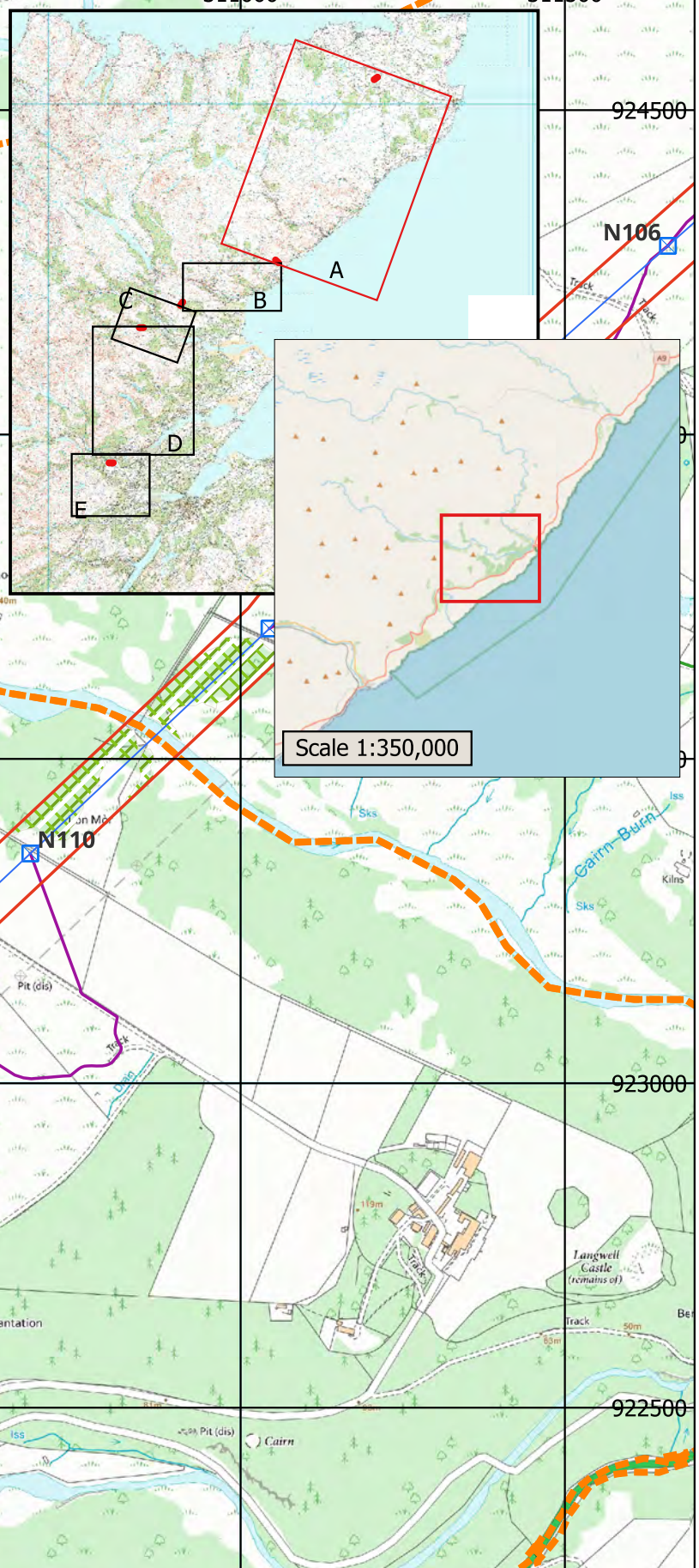
Scottish & Southern Electricity Networks

TRANSMISSION



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0 0.25 0.5 km

Legend

- Landownership boundary/parcel
- Operational Corridor
- Central line Operational Corridor
- Proposed 400kV OHL Towers
- 20m Access Corridor
- Access Tracks- Existing Upgrade
- Access Tracks- New Stone Perm
- Access Tracks- New Stone Temp
- NWSS- Native woodland
- Conifer woodland- Operational Corridor 90m
- Broadleaved woodland- Operational Corridor 90m

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Figure 1. Woodland Impacted by the Proposed Development
Section A- Welbeck Estate
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Scottish & Southern Electricity Networks
TRANSMISSION

A
B
C
D
E

Scale 1:350,000

N122
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N127
N128
N129
N130

Scale @ A3 1:10,000
N
0 0.25 0.5 km

Legend

- Landownership boundary/parcel
- Operational Corridor
- Central line Operational Corridor
- Proposed 400kV OHL Towers
- Management Felling
- Conifer woodland- Operational Corridor 90m
- Felled - Operational Corridor 90m
- 20m Access Corridor
- Access Tracks- Existing Upgrade
- Access Tracks- New Stone Perm
- Access Tracks- New Stone Temp

Woodland report
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Figure 1. Woodland Impacted by the Proposed Development
Section A- Welbeck Estate
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