Scottish & Southern Electricity Networks

TRANSMISSION

Dunoon to Loch Long 132 kV OHL Rebuild

Environmental Impact Assessment Report

Volume 4 | Technical Appendix

Appendix 12.1 - Overhead Line (OHL) Woodland Report

Section 4: Rashfield Farm, Deargacha, Cladaig House and Gleann Ban Woodlands (Towers 53 to 63)

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Contents:

1 Introduction

This Technical Appendix (TA) presents information relevant to the Dunoon to Loch Long 132 kV Overhead Line (OHL) Rebuild (hereafter referred to as the 'Proposed Development'), which is being constructed to replace an existing 132 kV OHL between the same points ("the Existing Line"). It should be read in conjunction with the **Volume 2 – Environmental Impact Assessment (EIA) Report** specifically **Chapter 3: Description of the Proposed Development** and **Chapter 12: Forestry** for full details of the Proposed Development.

The location of the Proposed Development is shown in **Volume 3, Figure 1.1 Site Location.**

2 Purpose of this Woodland Report

As part of the Environmental Impact Assessment (EIA) process, it was identified that the OHL construction and the access tracks required to construct the Proposed Development would cross a number of woodland areas within private or state-owned landholdings. The landholding property boundaries are identified in **Figure 12.1.4 Forestry Project Felling Map**.

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

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

3 Woodland Property

From the River Eachaig to the north, this section (known for the purpose of this forestry assessment as Section 4) of the development comprises five adjacent properties under four separate private ownerships, namely Rashfield Farm, Deargacha Forest, Gleann Ban Woodlands (two separate ownerships) and Cladaig House, a residential property.

The area is located three to five kilometres north of Dunoon. Deargacha Forest and Gleann an Woodlands form part of an extensive complex of commercial forestry extending from Ballochyle into Glen Lean and Glen Massan to the west, north along Loch Eck and south along the Forth of Clyde overlooking past Holy Loch and Dunoon. The section of the development between the River Eachaig and Tower 54 encompassing Rashfield Farm is predominantly farmland.

The Gleann Ban Woodlands are serviced by existing hard metalled forest road infrastructure accessible from the B836 to the south. The main vehicle access point is located at national grid reference 'NS 131 813'.

4 Development Requirements

4.1 Overhead Line

With reference to **Figure 12.1.4 Forestry Project Felling Map**, the sections of the proposed OHL applicable to each property are approximately from River Eachaig to just north of Tower 54 (Rashfield Farm), Towers 54 to 57 (Gleann Ban Woodland – north) and Towers 57 to 62 (Gleann Ban Woodland - south) after which the proposed OHL alignment crosses into another landholding (see woodland report for Section 5). There are no tower locations affecting the properties of Deargacha Forest and Cladaig House; these areas are impacted by over-sail only.

The 132 kV OHL standard tower dimensions for the project have a width of 10m cross-arm to cross-arm, i.e. from outside conductor to outside conductor. In addition to this, the safety Vicinity Zone from each conductor is a 3.5 m radius around the conductor.

The OHL infrastructure and minimum safety clearance distance is therefore 17 m (8.5 m either side of the OHL centreline) and this has been utilised to calculate the area of the operational corridor occupied by infrastructure. In some cases, such as angle towers the requirement may be slightly in excess of this distance, however the average minimum distance has been used in this assessment.

The study area for this assessment is based around the Operational Corridor (OC). The Applicant defines the area in which it has rights to remove woodland for the purposes of creation of new overhead lines (OHLs), 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 with reference to the distance at which a tree could fall and cause damage to the overhead line, resulting in a supply outage[1]. As a result, the final corridor width would be based on the safety distance required to allow for a mature tree falling towards the OHL at the mid-point on an OHL span between two towers, taking account of topography and tree height at maturity. Where the OC passes through areas of native woodland, it is noted that the width of woodland removal is likely to be reduced due to the lower height of the tree species present. The proposed OC illustrated in **Figure 12.1.4 Forestry Project Felling Map** has been based on the likely height of the woodland at maturity and therefore, varies in width according to the woodland type present.

The two forestry properties primarily impacted by the development are the Gleann Ban Woodlands (north and south). The future restructuring plans (clear felling and restocking) for each landowner have been reviewed.

The OC width that has been assessed and identified for the safe build and energisation of the new OHL through the areas of commercial conifer woodland is 81 m (40.5 m either side of the OHL centreline).

The OC width that has been assessed and identified for the safe build and energisation of the new OHL through the areas of native broadleaved woodland is 60 m (30 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.

4.2 Access Track Route Design

The Gleann Ban Woodlands commercial conifer forest is serviced from the B836 public road by a network of hard metalled forest roads that are regularly used for timber haulage. These forest roads will form part of the main vehicle access route for the Proposed Development including associated forestry works **Figure 12.1.4 Forestry Project Felling Maps** and will be subject to maintenance and upgrade works as part of the construction work scope.

General access track tree maintenance work may be required along the existing forest road in preparation for the civil engineering access track upgrade works.

In the majority of cases, access tracks to individual tower sites will be confined to the OC. In several cases where the proposed route of a new access track routes fall outside the OHL operational corridor, the width required to be cleared is 20m wide (10m either side of centreline) **Figure 12.1.4 Forestry Project Felling Map**, thus increasing the impact of woodland removal in that area.

[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)

Stump removal and mulching of young trees and forest residue will be required for the installation of new access tracks and at each tower location for the formation of a construction compound and temporary crane pad.

5 Woodland Characteristics

The Rashfield Farm and Gleann Ban Woodlands section of the Proposed Development comprises five adjacent properties that include farmland interspersed with mixed woodland, a residential property and a significant area of commercial conifer forest, see **Figure 12.1.4 Forestry Project Felling Map**. The trees and woodlands in this area are impacted from the River Eachaig, mid-way between Towers 52 and 53, southward to Tower 63.

The section between the River Eachaig and Gleann Ban Woodlands is predominantly farmland containing minor fragments of unmanaged amenity broadleaved woodland set within or on the edge of improved pasture and one more substantial block of native broadleaved woodland. Additionally, there is a small stand of non-commercial specimen conifers by a minor public road and a small number of assorted trees associated with the Cladaig House residential property.

The Gleann Ban Woodlands are a significant area of commercial conifer plantation comprising two adjacent properties under different private ownerships. Both properties were originally planted at approximately the same time and woodland management is carried out through a regime of clear felling and replanting, the dominant tree species being Sitka spruce *Picea sitchensis*.

Plate 1 – View of Ballochyle Hill and Gleann Ban Woodland looking north from Tower 64

The adjacent Gleann Ban (north) plantations have undergone minor restructuring with young conifer crops evident in low ground areas (circa. 5 to 10 years old) and the mature crop (circa. 40 years old) on the slopes above remaining largely undisturbed. These areas do not have a Long Term Forest Plan. However, both

Gleann Ban properties are currently subject to Statutory Plant Health Notices (SPHN) due to infection of larch by *Phytophthora ramorum* and associated Felling Permission has recently been secured for this area.

The Gleann Ban (south) plantations have undergone significant restructuring in recent years in accordance with an approved Long Term Forest Plan as part of ongoing commercial timber production activities. The age of the conifer crops in this area range from young plantation (circa. 10 to 12 years old) to mature woodland (circa. 40 years old). Pockets of windblow occur within the mature plantations.

Much of the development route is set across strong to very steep, moderately rocky slopes and coincides with generally free-draining brown earth soils with humus-iron podzols. On the gentler slopes at the southern end, ground conditions are characterised by wetter, peaty gley soils. [2]

A desk-based study of the woodland areas was conducted utilising open-source data from Nature Scot's Ancient Woodland Inventory and Scottish Forestry's Native Woodland Survey of Scotland (NWSS), to identify native woodland and environmental classifications.

NatureScot's AWI revealed an area of Long-Established Woodland (of plantation origin) on the lower slopes of Gleann Ban (south). The area of native woodland straddling Deargacha Forest and Rashfield Farm is Ancient Woodland.

The Scottish Forestry NWSS classifies native woodland types in four categories, native woodland, nearly-native woodland, open land habitat and Plantations on Ancient Woodland Sites (PAWS). The NWSS identifies one area of PAWS within the operational corridor, a substantial area either side of the Little Eachaig River coinciding with the plantations between Towers 61 and 63. A smaller area in the plantation just west of Cladaig House and Tower 55 lies outside the operational corridor but inside the management felling area.

The total area of Ancient Woodland (of semi-natural origin) is 0.99ha. The area of PAWS containing exotic commercial conifers is 2.44ha.

The operational corridor has been reduced to a width of 60m for broadleaved woodland to increase opportunities for retention.

5.1 Rashfield Farm

Beginning at the River Eachaig mid-way between Towers 52 and 53 and extending to just north of Tower 55, Rashfield Farm is the first property in this section **Figure 12.1.4 Forestry Project Felling Maps.**

As the proposed OHL alignment crosses the river, it impacts two small clumps of mixed broadleaves set within improved pasture. The proposed OHL alignment crosses the neighbouring property, Deargacha Forest, for a short distance between Towers 53 and 54, impacting a small area of native woodland on the field edge to the south. A further small area of native broadleaved woodland is potentially impacted by the 20m corridor required for the proposed temporary access track between Towers 53 and 54, routed along an existing quad bike track that cuts through an area of native woodland to the east. A number of small native broadleaves are also impacted along the field edge north of Tower 55.

5.2 Deargacha Forest

As mentioned above, the OHL over-sails a short section of Deargacha Forest between Towers 53 and 54, a distance of approximately 117m. This impacts on an area of alder and birch dominated semi-natural native woodland located at the edge of a young commercial plantation immediately. This block of native woodland, together with the adjacent area on Rashfield Farm, is recorded as an Ancient Woodland (of semi-natural origin) on NatureScot's Ancient Woodland Inventory (AWI).

[2] Scottish Government Scotland's Soil website https://map.environment.gov.scot/Soil_maps

5.3 Gleann Ban (north)

The OHL crosses into Gleann Ban (north) just to the north of Tower 55, see **Figure 12.1.4 Forestry Project Felling Map**, impacting on area of mixed woodland between the property boundary with Rashfield Farm and a minor public road. This comprises a small area of predominantly wet native woodland and a stand of nineteen non-commercial western red cedar, recorded as a PAWS site on the Scottish Forestry NWSS database.

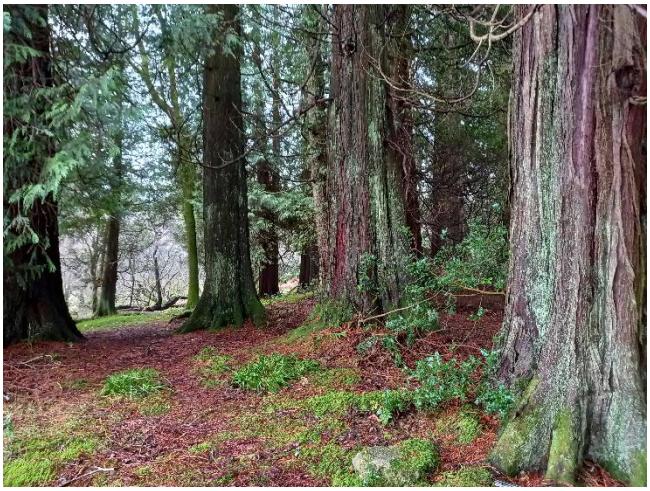

Plate 2 – Western red cedar at Tower 55

The cedars are mature specimen trees (circa. 80 years old) of a considerable size, retained for amenity purposes and valued as notable examples of this species in Argyll. The measured average diameter is 1.0m and estimated volume 194m^3, equating to some 1,900m^3 per hectare. Owing to the lack of demand for this species and their unfavourably large size, these trees have negligible commercial value but the landowner intends to use the highly durable timber for local building projects.

South of Tower 55, the OHL crosses a minor public road, over-sailing a small area of land at Claddaig House before entering the extensive commercial conifer plantation of Gleann Ban (north). Extending to just north of Tower 58, this section of the development is located on steep to very steep, moderately rocky slopes below Ballochyle Hill. The plantation was established some 40 years ago on bare hill ground with mixed species comprising Sitka spruce *Picea sitchensis*, western hemlock *Tsuga heterophylla*, Japanese larch *Larix kaempferi* and Scots pine *Pinus sylvestris*. The productivity across much of the crop is below average with Sitka spruce generally achieving Yield Class 12, improving to Yield Class 18 at the southern end.

The crop is un-thinned and typically of average form and quality with a relatively low average diameter. The estimated volume of the standing trees is 330m^3 per hectare with the better grown areas to the south achieving 450m^3 per hectare.

Plate 3 – Mature spruce crop between Towers 57 and 58

The property was recently served with a Statutory Plant Health Notice (SPHN) due to infection of larch by *Phytophthora ramorum* and Felling Permission has been secured for the operational corridor and associated management felling area to achieve an appropriate wind-firm felling boundary. The steeper slopes will require specialist sky-lining equipment to extract the timber.

5.4 Claddaig House

As mentioned, to the south of Tower 55 **Figure 1.0 Forestry Project Felling Maps**, the OHL over-sails a small section of land belonging to Claddaig House, impacting numerous trees including a small number of mid-mature spruce and mixed broadleaves (circa. 20-30 years old) in addition to a mature Scots pine (circa. 100+ years old). These trees have nominal value.

Plate 4 – Land at Cladaig House just west of Tower 55

5.5 Gleann Ban (south)

Adjacent to Gleann Ban (north), the Gleann Ban (south) plantations extend from north of Tower 58 to Tower 63, see **Figure 12.1.4 Forestry Project Felling Map**, occupying the same steep ground below Ballochyle Hill which gives way to gentler the slopes and wetter soils to the south-west. Much of the area between the northern boundary of the property just north of Tower 58 comprises Sitka spruce and Japanese larch (circa. 33 years old). These crops are well grown and of good quality, the spruce achieving a Yield Class of between 18 and 22. Pockets of recent windblow occur at the southern end in the vicinity of Tower 60. The estimated volume of the standing trees is 450 to 485m^3 per hectare.

Plate 5 – Mature spruce crop looking towards Tower 58

In common with Gleann Ban (north), this part of the plantation is subject to a Statutory Plant Health Notice (SPHN) due to infection of larch by *Phytophthora ramorum*. The subject area, including the operational corridor and management felling area required to achieve wind-firm boundaries, is already included in the current Long Term Forest Plan. The steeper section around Tower 58 will require specialist sky-lining equipment to extract the timber.

Extensive restructuring has taken place elsewhere in the forest with well-established young Sitka spruce restock (circa. 12 years old) occupying the ground north and west of Tower 60, see **Figure 12.1.4 Forestry Project Felling Map**. Here, the development crosses the Gleann Ban forest road and impacts on a smaller block of mature Sitka spruce and Japanese larch (circa. 33 years old) adjacent to the Balagowan Burn. This stand is windblown on the north-eastern edge but well-grown with an estimated volume of 450m^3 per hectare. Felling is scheduled for the second felling phase (2021-26) of the current Long Term Forest Plan.

From here, the development twice crosses forest roads to Towers 61 and 62, impacting the southern end of a substantial young Sitka spruce restock (circa. 9 years old) that extends north up Gleann Ban.

Plate 6 – Young spruce crop at Tower 59

South-east from Tower 62, the development impacts Balgowan Wood, an area of mature Sitka spruce and western hemlock (circa. 39 years old) located on moderate slopes on the north side of the Little Eachaig River. The spruce here is well-grown at Yield Class 20 and standing volume of 625m^3 per hectare, less so the western hemlock with a standing volume of some 220m^3 per hectare. Felling is scheduled for the second felling phase (2021-26) of the current Long Term Forest Plan.

After crossing the Little Eachaig and B836 public road, the development enters different ownership immediately south of Tower 63, impacting on a row of mixed conifer between the river and the road. South of the road, the trees have been felled but not restocked. There are a small number of mixed broadleaves on the banking above the road. These trees have nominal value.

The Scottish Forestry NWSS database identifies a substantial area of PAWS either side of the Little Eachaig River, including the plantations located within the operation corridor between Towers 61 and 63.

The woodland impact assessment included appraisal of woodland exposure to windblow resulting from the removal of mature trees within the operation corridor. **Figure 12.1.4 Forestry Project Felling Map** identifies

proposed management felling out with the operational corridor to achieve suitable wind-firm felling boundaries and reduce impacts on forest management and forest landscape.

The total area of management felling proposed is 23.23ha of commercial conifer woodland. This felling is not included within the scope of the Proposed Development (for the purpose of the application for consent under Section 37 of the Electricity Act 1989). This additional felling is subject to landowner agreement and it is the responsibility of the landowner to consult Scottish Forestry and obtain appropriate felling consent. In the case of the Gleann Ban Woodlands, relevant felling consent has already been obtained in response to Statutory Plant Health Notices (SPHNs).

6 Windthrow Risk Impact

The proposed OHL alignment within the Gleann Ban Woodlands crosses very to very steep, moderately rocky slopes and coincides with generally free-draining brown earth soils with humus-iron podzols between approximately Towers 55 and 60 and wetter, peaty gley soils on the gentler slopes between Towers 60 and 63.

The mature woodland sites affected by the Proposed Development are classified as sheltered in relation to wind hazard risk. The local climate is classified as warm and moist.

These factors suggest site conditions with moderate to limited flexibility for the management and growth of trees crops. The management felling identified in **Figure 12.1.4 Forestry Project Felling Map** has been proposed to achieve suitable wind-firm boundaries and pragmatic forest management outcomes.

Therefore, increased windthrow risk is unlikely to result from removal of young and mature conifers within the OHL operational corridor. Additionally, the impact of wind-throw on native broadleaves is likely to be minimal due to their size, structure and general sheltered locations.

7 Woodland Management Impact

The OHL alignment will create additional challenges for the future management of the forest as it dissects existing management coupes. The constraint associated with the introduction of the OHL into the forest environment will be reduced by regular maintenance of the operational corridor, which will avoid the incidences of “Red Zone” trees.[3]

The OHL alignment crosses the forest road network and will be built to comply with statutory clearances above forest roads/access tracks, which will reduce the hazard in respect of future timber haulage.

The OHL alignment 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.

The Proposed Development will result in the permanent removal of existing mature and young conifer woodland and broadleaved woodland from the operational OC. This will reduce the productive forestry land available for planting within the woodland property area, as the OC will require to be kept clear of trees. However, this loss of ground will to some extent be ameliorated in the future as the redundant operational corridor for the Existing Line is incorporated back into the forest area following de-commissioning of the existing OHL.

[3] 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)

During the construction phase, there will be a level of disruption to the undertaking of routine forestry management activities by the Landowners on the woodland property. This will be project managed through communication and agreement with them.

8 Mitigation Opportunities

A reduced OC width of 60m has been assessed for the areas of native broadleaved woodland. Prior to the construction phase these areas will be assessed for further selective felling to identify if greater tree retention can be achieved. This will be dependent on the scope of the construction activities and in particular the requirement to safely install the electrical conductor (cable).

The operational corridor woodland removal area is required for the construction and operation of the new OHL infrastructure. Opportunities will be assessed for woodland replanting 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 **Appendix 12.5 Compensatory Planting Strategy**, will fully mitigate the operational corridor woodland removal area by replanting the area quantity (hectares) of woodland removed.

The management felling (those areas outwith the OC that require to be felled) areas will be replanted by the Landowner in accordance with the usual legal obligations associated with Scottish Forestry Felling Permissions.

9 Woodland Removal Impact

Table 9.1 Woodland Removal for Infrastructure		
Item	**Woodland Type**	**Area**
OHL	Mature conifer plantation	8.82
	Young conifer plantation	4.06
	Native broadleaved woodland	1.28
Access Track Corridor	Mature conifer plantation	0.58
	Young conifer plantation	0.00
	Native broadleaved woodland	0.15
Total		**14.89**

Table 9.2 Compensatory Planting		
Compensatory Planting Area	Mixed conifer or mixed broadleaves	14.89

Table 9.3 Woodland Removal Impact of Infrastructure		
Total Loss of Woodland Area		14.89
Total Compensatory Planting Area		14.89
Total Net Loss of Woodland Area		**0.00**

Table 9.4 Woodland Removal for Management Felling		
Item	**Woodland Type**	**Area**
Management Felling	Mature conifer tree crop	25.33
Replanting/Restocking	Predominantly conifer	25.33
Net Loss of Woodland Area		**0.00**
Note. Felling approval is via Scottish Forestry Felling Licence application process or Long Term Forest Plan application or amendment process.		

10 Compensatory Planting

Compensatory planting to achieve the area quantity (hectares) of woodland removal will be provided for the OHL and access track operational corridor area and will be in accordance with the Scottish Government's CoWRP[4] objective of no net loss of woodland.

11 List of Appendices

Figure 12.1.4 - Forestry Project Felling Map

[4] The Scottish Government's Policy on Control of Woodland Removal, Forestry Commission (2009)

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Dunoon to Loch Long 132kV OHL Rebuild

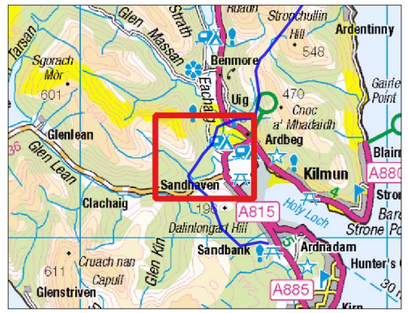
Figure 12.1.4
Rashfield Farm, Deargacha, Cladaig House and Gleann Ban Woodlands Forestry Project Felling Map

Key

- Property Boundary
- Proposed OHL Alignment
- Proposed Tower Position
- Operational Corridor

Proposed Powerline Tree Removal

- Mature Conifer - 81m Operational Corridor and 20m Access Track Corridor
- Young Conifer - 81m Operational Corridor(<15 years old)
- Native Woodland - 60m Operational Corridor and 20m Access Track Corridor
- Native (AWI) - 60m OC
- Management Felling
- Felled
- Open Ground or Other Land
- Existing Tracks
- Proposed Retained Access Track
- Proposed Access - Temporary



Galbraith

N	Scale	1:10000		
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