Scottish & Southern Electricity Networks

TRANSMISSION

Creag Dhubh to Dalmally 275kV Connection

Environmental Impact Assessment

Volume 4 | Appendix 10.2

Outline Peat Management Plan

April 2022

Scottish & Southern Electricity Networks
TRANSMISSION

CONTENTS

List of Abbreviations

BGS	British Geological Survey
CEMP	Construction Environmental Management Plan
CGL	Card Geotechnics Limited
cm	Centimetre
'Deep Peat'	A carbon-rich soil with a surface peat layer greater than 0.5 m thickness (in the context of the 2016 SNH/ NatureScot Carbon and Peatland Map) or a peat layer of greater than 1 m thickness (in the context of the Scotland Soil Classification). It should be noted that there is no agreed definition of 'deep peat'
ECoW	Environmental Clerk of Works
EIA	Environmental Impact Assessment
EIA Report	Environmental Impact Assessment Report
GEMP	General Environmental Management Plans
GIS	Geographic Information System
IDW	Inversive Distance Weighted (IDW)
JNCC	Joint Nature Conservation Committee
LOD	Limit of Deviation
km	Kilometre
m	Metre
OHL	Overhead Line
'Peat'	Dead and partially decomposed plant remains that have accumulated under waterlogged conditions (Ramsar Convention, 1971). An organic soil which contains more than 60 percent of organic matter and exceeds 50 cm in thickness (Macaulay Institute, 1984). It should be noted that there is no agreed definition of 'peat'
'Peatland'	An ecosystem with a peat deposit that may currently support a vegetation that is peat forming, may not, or may lack vegetation entirely (Ramsar Convention, 1971).
Plasticity	Defined as is the ability of a soil to undergo deformation without cracking or fracturing.
PMP	Peat Management Plan
SEPA	Scottish Environment Protection Agency
SPEN	Scottish Power Energy Networks
SNH	Scottish Natural Heritage
SSEN	Scottish and Southern Electricity Networks

1 Introduction

1.1 The Proposals

1.1.1 This Technical Appendix (TA) presents information relevant to the Creag Dhubh to Dalmally 275kV Connection. It should be read in conjunction with the following:

- **Chapter 2: Description of the Proposed Development (EIAR Volume 2) (for full details of the Proposed Development);**
- **Outline Construction Environmental Management Plan (CEMP) (Technical Appendix 2.2 EIAR Volume 4);**
- **SEPA Consultation Meeting Minutes (Technical Appendix 10.7, EIAR Volume 4);**
- **Peat Depth Survey Report (Technical Appendix 10.1, EIAR Volume 4); and**
- **Peat Landslide Hazard Risk Assessment (PLHRA) (Technical Appendix 10.3, EIAR Volume 4).**

1.1.2 Scottish Hydro Electric Transmission plc (the Applicant) who, operating and known as Scottish and Southern Electricity Networks Transmission (SSEN Transmission), own, operate and develop the high voltage electricity transmission system in the north of Scotland and remote islands. Due to the growth in renewable electricity generation in the north and north-east of Scotland, upgrade of the transmission network is required in order to provide the necessary increase in transmission capacity.

1.1.3 The Applicant is proposing to apply for consent under Section 37 of the Electricity Act 1989 to construct and operate a 13.3 kilometre (km) double circuit 275 kV overhead line (OHL), supported by lattice steel towers between a proposed substation at Creag Dhubh and the existing Scottish Power Energy Networks (SPEN) 275 kV OHL from Dalmally to Inverarnan, near Glen Lochy, connecting via a Tie-In connection located between existing SPEN Towers YW17 and YW18(the 'Proposed Development'). The location of the Proposed Development is shown in **Figure 1.1: Location Plan and Overview (EIAR, Volume 3a).**

1.2 Requirement for the PMP

1.2.1 Ramboll was commissioned by the Applicant to undertake peat depth and coring surveys, presented in **Technical Appendix (TA) 10.1: Peat Survey Results Report (EIAR Volume 4)**, to aid the design process and inform the Outline Peat Management Plan (PMP) for the Proposed Development, as presented here within.

1.2.2 This Outline PMP has been prepared as a TA to support the Environmental Impact Assessment Report (EIAR) for the Proposed Development. This TA has been produced in accordance with guidance published by Scottish Environment Protection Agency (SEPA), NatureScot (formerly Scottish Natural Heritage), and the Scottish Government, which is referenced in the following sections. This PMP specifically refers to the overhead line and associated infrastructure. A separate PMP has been prepared that specifically considers the proposed Creag Dhubh substation and associated infrastructure[1].

1.2.3 A more detailed PMP will be undertaken post-consent following more extensive ground investigation, and will specify the proposed peat and soil management methodologies to be employed during construction as part of the Construction Environmental Management Plan (CEMP).

1.2.4 The purpose of the PMP is to:

- define the materials that will be excavated as a result of the Proposed Development, focusing specifically on the excavation of peat;
- report detailed investigations into peat depths affected by the Proposed Development;

[1] Ramboll, 2022. Creag Dubh Substation Draft Peat Management Plan. Environmental Appraisal Volume 2, Technical Annex 8.2.

- detail proposals for the management of excavated peat and other soils;
- determine volumes of excavated arisings and proposals for re-use or reinstatement using excavated materials; and
- detail management techniques for handling, storing and depositing peat for reinstatement.

1.2.5 The PMP is a 'live' document and will evolve during the different stages of the Proposed Development and as such will be subject to review to address:

- requirements to discharge future consent and planning conditions;
- detailed ground investigations and design development;
- unforeseen conditions encountered during construction;
- changes in best practice during the life of the Proposed Development; and
- changes resulting from the construction methods used by the Principal Contractor.

1.2.6 Whilst this PMP provides a base standard for good practice, where avoidance or further minimisation of risks to the environment can be demonstrated through use of alternative methods or improvements to current practices, the Principal Contractor will implement these wherever possible.

1.2.7 The Stage 1 PMP has been prepared in accordance with appropriate guidance and best practice[2,3,4].

1.3 Limitations and Assumptions

1.3.1 The site is predominantly covered with a varying thickness of peat and carbon-rich soils. The design of the Proposed Development has taken into consideration peat depths, along with other technical and environmental constraints, and the Proposed Development's infrastructure has been sited away from these areas, where possible.

1.3.2 Peat probing and mapping have been used to inform the design process at strategic points in the design evolution of the Proposed Development. However, there are some differences between the final design and the extent of the peat survey results based on design changes made through this process, as a result of micrositing etc[5].

1.3.3 However, the peat survey probing points do provide high resolution coverage of the site, which revealed the peatland to be typically shallow (<1.0 m) but with pockets of deeper peat. It is considered that the peat depths collected, and interpolations derived from these data, are representative of the site and have adequately informed the layout of the Proposed Development.

1.3.4 The peat excavation and reuse volumes included in this Outline PMP are intended as an initial indication. They are based on a series of design assumptions and estimates for the Proposed Development layout and peat depth sample data interpolated across discrete areas of the Site[2]. Such parameters can still vary over a small scale and therefore local topographic changes in the geological profile may impact the total accuracy of the volume calculations.

[2] Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only.
[3] Scottish Renewables and SEPA (2012). *Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste*.
[4] SEPA (2011). *Restoration Techniques Using Peat Spoil from Construction Works.*
[5] These changes are considered to be minor and not significant.

1.3.5 The PMP is a 'live' document and would be further developed when the Principal Contractor has been appointed, post consent. Further peat probing would be undertaken along with detailed ground investigation surveys to finalise and inform the detailed PMP post consent, prior to construction works commencing. This approach informs the Proposed Development and can minimise impacts on deep peat.

2 PEATLAND CONDITION

2.1 Definitions of Peat

2.1.1 Organic material less than 0.5 m depth is not defined as peat by the Scottish Government, NatureScot, and SEPA guidance *Peatland Survey. Guidance on Development on Peatland (2017)*[6], which states that 'peat soil is an organic soil which contains more than 60 per cent of organic matter and exceeds 50 centimetres (cm) in thickness'. This is also confirmed by The James Hutton Institute who define shallow peat as having a 'prescribed depth of organic matter of 50-100 cm', and the Forestry Commission who use 45 cm as the critical depth for peat to occur. On this basis, peat is classified as organic material over 0.5 m in depth.

2.1.2 Peat can be separated into three main layers: acrotelmic (the upper living layer), catotelmic (the middle to lower layer) and occasionally amorphous (lower layer) peat.

2.1.3 Acrotelmic peat is the living layer of peat including the peat turf or turve being a thin, floating vegetation mat layer. The acrotelm is generally found within the top layer of peat (often less than 0.5 m) depending on the degree of decomposition and fibrous nature of the peat (approximately H1 to H6 on the Von Post classification scale **(see EIAR Volume 4: TA 10.1)**). The acrotelm is generally of high permeability, decreasing with depth. The water table fluctuates in this layer and conditions vary from aerobic to anaerobic. Material may be fibrous or pseudofibrous (plant remains recognisable), spongy, and when excavated strength is lost but retains integral structure and can stand unsupported when stockpiled over 1 m.

2.1.4 Catotelmic peat is the dead layer of peat found deeper than acrotelmic peat which has some remnant plant structures. Material has high water content and is permanently below the water table (saturated) therefore organic matter decomposes anaerobically. Some plant structures may be recognisable but are highly humified losing most of their characteristics (approximately H6 to H9 on the Von Post classification scale) and strength. Water flow through the catotelm is slow unless peat structures such as sink holes or peat pipes are present.

2.1.5 Finally, amorphous peat is highly decomposed organic material where all recognisable plant remains are absent (approximately H9 to H10 in the Von Post classification scale). These deposits are dark brown to black in colour, plastic, are low tensile strength and are unable to stand unsupported over 1 m when stockpiled.

2.2 Desk Study

2.2.1 Review of online British Geological Survey (BGS) mapping[7] for the Proposed Development indicates that the majority of the site to be underlain by Diamicton Till, with small areas of peat or areas absent of superficial deposits. These are underlain by psammite, semipelite and pelites of the Argyll Group, interspersed with areas of unnamed igneous intrusions **(see Figure 10.4 Superficial Geology and Figure 10.5: Bedrock Geology, EIAR Volume 3a).**

[6] Scottish Government, Scottish Natural Heritage, SEPA (2017), *Peatland Survey. Guidance on Developments on Peatland, on-line version only. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2018/12/peatland-survey-guidance/documents/peatland-survey-guidance-2017/peatland-survey-guidance-2017/govscot%3Adocument/Guidance%2Bon%2Bdevelopments%2Bon%2Bpeatland%2B-%2Bpeatland%2Bsurvey%2B-%2B2017.pdf*

[7] British Geological Survey (2021), *Natural Environment Research Council – online Geology of Britain Viewer*. Available at: http://mapapps.bgs.ac.uk/geologyofbritain/home.html.

2.2.2 The NatureScot carbon rich soils, deep peat and priority habitat mapping[8] shows the area between T33 and Glen Lochy (Succoth Glen) as predominantly 'Class 5' soils'[9], particularly in areas covered by commercial plantation, which are defined as mineral or peat soils with no peatland vegetation. Large areas of 'Class 2'[10] and 'Class 3'[11] soils are present in the open areas around Creag a'Mhaol-diridh which are not dominated by commercial plantation. Class 2 soils[10] are of national importance and are defined as peat soils with high potential to be restored to peatland. Further areas of Class 2[10] and 3[11] soils extend across open areas to the south of Achlian and on open land to the south of Cladich (**see Figure 10.8: Soils Maps of Scotland, EIAR Volume 3a)**.

2.3 Summary of Peat Depth

2.3.1 Most of the Proposed Development area of the Site has either no peat present or has a shallow depth of peat soil present (~82% <0.5 m in depth). Whilst the majority of coverage is relatively shallow, the maximum depth of peat recorded was 4.3 m, located 250 m north of Tower 33A. The mean peat depth recorded was 0.8 m. The design of the Proposed Development has considered peat depths, along with other technical and environmental constraints, and the Proposed Development's infrastructure has been sited away from these areas, where possible. Peatland habitats are also described in **EIAR Volume 2, Chapter 6: Biodiversity** and shown in **Figure 10.2.1** of this TA**.**

2.4 Peatland Condition

2.4.1 Three peat depth surveys were undertaken at the Proposed Development site, with a combined total of 2,090 peat probes taken. The results of the surveys were used to inform the design layout of the Proposed Development.

2.4.2 Most of the developable area has either no peat or has a shallow depth of peat present (approximately 82 % of peat probes recorded <0.5 m in depth). These areas of shallow peat can be considered as organo-mineral soils. These are further summarised as follows:

- 1,220 no. samples (58 %) located on land with no peat/ absent;
- 499 no. samples (24 %) located on land with less than or equal to 50 cm depth of peat or organomineral soil;
- 176 no. samples (8 %) fell on land with between 51 cm and 100 cm depth of peat; and
- 195 no. samples (9 %) located on land with more than 100 cm depth of peat.

2.4.3 The survey results indicate that the peat depth is variable ranging between 0.0 m and 4.3 m thickness. The peat thickness along the Proposed Development was found be mostly shallow, with some pockets of deep peat near Tower 15 and between Towers 31A and 36A, but these pockets are located out with the LOD for the towers. The peat probe depth and interpolated contours[12] are shown on **Figure 10.2: Peat Depths, EIAR Volume 3a**. The mean peat depth recorded was 0.8 m.

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[8] Scottish Natural Heritage. (2016),*Carbon and Peatland 2016 map*. Available at: http://map.environment.gov.scot/soil_maps/.

[9] Class 5 soils are described as indicative of 'Peat Soil' with no indicative vegetation. Class description is described as 'soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon rich and deep peat'.

[10] Class 2 soils are described as indicative of 'Peat soil with occasional peaty soil' with indicative vegetation defined as 'peatland or areas with high potential to be restored to peatland'. Class description is described as 'nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas of potentially high conservation value and restoration potential'.

[11] Class 3 soils are described as indicative of 'Predominantly peaty soil with some peat soil' with indicative vegetation defined as 'peatland with some heath'. Class description is described as 'dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon rich soils, with some areas of deep peat'.

[12] The peat depth data was interpolated in GIS using an inverse distance weighting approach.

2.4.4 Overall, the peat sampled across the developable area of the Site is relatively shallow, however some deeper pockets were noted (see Section 2.4.3). The peat sampled was generally dry and in a state of moderate decomposition. This has mostly resulted from commercial forestry, which is present across the development site (refer to **Figure 10.2: Peat Depths, EIAR Volume 3a**. This land use causes modification to soils from planting, management and felling activities. Changes to hydrology, also occur from artificial drainage measures, which are installed to prevent trees becoming waterlogged. As such, modification occurs to the integrity and composition of the peat and carbon rich soils.

2.4.5 The Proposed Development's infrastructure has been located away from these deeper peat locations where practicable, taking into account other environmental and technical constraints, or microsited to minimise potentially significant adverse effects. However, based on the other design and technical constraints, it has not been possible to site the Proposed Development entirely outwith areas of peat.

2.4.6 Further details of the peatland condition and findings from the peat surveys are included in the Peat Depth Survey Report (**Technical Appendix 10.1, EIAR Volume 4).**

2.5 Estimated Peat Balance

2.5.1 The volume of peat required to be excavated and reinstated due to the Proposed Development has been estimated based on the following data and assumptions:

- peat depth survey data from probing undertaken at the site;
- excavations take place only within the footprint of the Proposed Development;
- peat will shrink on replacement due to some inevitable dewatering during handling and compaction at placement;
- potential for use of floating access tracks would be used based on engineering constraints in addition to traditional excavated tracks;
- temporary peat excavated for temporary infrastructure such as the construction compound and laydown could be reinstated, and therefore not considered as part of the permanent excavation volumes; and
- for the purpose of the assessment and in the absence of any peat characteristic information it is assumed that the top 0.5 m is characterised as acrotelmic peat, with catotelmic peat below that.

2.5.2 Specific design assumptions used to estimate the peat volumes to be excavated and reinstated due to the Proposed Development are:

- the proposed excavation footprints for 48no self-supporting fabricated steel lattice towers. It has been assumed that an area of 50 m x 50 m of disturbance would be required at each tower location and 80 m x 80 m for angle towers;
- tower locations that cannot be relocated or microsited to avoid deep peat would utilise a piled foundation solution, where practicable, and no significant peat volumes would be excavated. For the purpose of this assessment this has been assumed for towers located on >1.0 m of peat;
- upgrades to existing access tracks and construction of new tracks would be required, and, where possible, these would use 'floating' construction techniques where these are located over deep peat. It is assumed that no significant volumes of peat would be excavated and temporary access tracks could be reinstated on completion of construction works; construction activities would be undertaken in accordance with the good practice measures included within the Applicants General Environmental Management Plans (GEMPS) (**TA 2.3, EIAR Volume 4**).

2.5.3 Construction compound sites (temporary/permanent) have not been identified at this stage. This will be the responsibility of the principal contractor, who will identify suitable sites and apply for separate planning permission.

2.5.4 **Table 10.2.1** provides an estimate of the volumetric peat excavation for the Proposed Development. These volumes would be subject to review and updated following ground investigation, and detailed design as part of the post-consent process, prior to construction.

Table 10.2.1: Estimated Peat Volume to be Excavated

Element	Estimated Total Peat Volume to be Excavated (m^3)	Estimated Acrotelmic Peat Volume to be Excavated (m^3)	Estimated Catotelmic Peat Volume to be Excavated (m^3)
Towers	18,000	12,500	5,500
Permanent Access Tracks	0	0	0
Temporary Access Tracks	0	0	0
TOTAL	**18,000**	**12,500**	**5,500**

2.5.5 **Table 10.2.2** provides an estimate of the potential reinstatement opportunities for the Proposed Development.

Table 10.2.2: Estimated Peat Volume to be Reinstated

Element	Area to be Restored (m^3)	Average Depth of Restoration Area (m)	Volume of Acrotelmic Peat reinstatement (m^3)	Volume of Catoltelmic Peat Reinstatement (m^3)	Total Reinstatement (m^3)
Towers	12,000	1.0	12,000	5,500	17,500
Permanent Access Tracks	0	0	0	0	0
Temporary Access Tracks	0	0	0	0	0
Habitat Restoration and Management Areas	1,000	0.5	500	0	500
TOTAL			**12,500**	**5,500**	**18,000**

2.6 Classification of Peat

2.6.1 Peat was characterised as part of the peat survey which considered the physical properties of peat cores taken across the Proposed Development Site. The key measures of peat condition, which are important to establishing the appropriate type of reuse, are noted in **Table 10.2.3Table 10.2.3**: Peat Classification . Overall, the sample results suggest that the acrotelm layer is variable in depth and it is recommended that the upper 0.5 m should be reused as part of the reinstatement programme, where this depth of material is available. Excavation of 0.5 m ensures that the acrotelm remains as intact as possible and captures much of the underlying seed bank material which would aid vegetation regeneration. With regards to the catotelm material within the proposed developable area of the Site, the results indicate that all material is intermediate.

Table 10.2.3: Peat Classification

Peat Type	Key Measures and Survey Summary
Acrotelm	Depth - The depth of the acrotelm ranged from 0 cm to 150 cm, with a mean depth of 41 cm. Due to the difficulties of excavating a thin layer of acrotelm, without causing significant damage, it is recommended that 0.5 m of surface peat is excavated (where possible) for reuse as acrotelm material.
Acrotelm/Catotelm	Degree of humification – the sub-samples were mostly recorded as intermediate.
	Fibrous content – the samples range from low to high fine fibres (F1-F3). Coarse samples were mostly assessed as being of low coarse fibre content.
	Water content - the results indicate that most of the samples were dry or semi-dry peat (B1 to B3). One samples was recorded as wet.
	Von Post - the results indicate that nearly all the samples scored relatively high on the Von Post scale (>H4) indicating a moderate to strong rate of decomposition. This is likely to be as a result of the presence of commercial forestry at the Proposed Development, and potentially modified nature of the soils present (refer to section above explaining this).

3 REQUIREMENTS FOR THE DETAILED PEAT MANAGEMENT PLAN

3.1.1 The Principal Contractor would be required to update this Outline PMP prior to the construction phase commencing, based on additional information such as the results of further ground investigations and detailed design. As part of this update the following key activities are anticipated:

- Update the PMP with relevant measures as set out in SSENs General Environmental Management Plans (GEMPS) as included in **TA 2.3, EIAR Volume 4** with specific reference to 'Working in Sensitive Habitats' and 'Soil Removal, Storage and Reinstatement';
- Ensure the excavated peat is placed in peat storage areas at the infrastructure location ready for the restoration phase;
- Reuse some of the excavated peat, on-site, as indicated in **Table 2**. The PMP should specify where the contractor intends to reuse peat on site and provide estimates of the quantities that will be used. The reuse of peat will be subject to the conditions and methods of reinstatement described in the PMP and relevant GEMPs; and
- Remaining peat will be used for habitat restoration.

3.1.2 The final PMP would include the following:

- project background, such as the Proposed Development description, peat-related planning conditions attached to the consent, and peat management recommendations as per consultation with SEPA (**TA 10.7**);
- confirmation of excavated peat volumes based on completion of ground investigation and review of detailed design;
- review of peat restoration opportunities, including restoration requirements as part of the proposed Creag Dhubh substation project;
- a construction timetable and highlight any seasonal considerations;
- comply with SEPA construction site licence, as required;
- a detailed method statement for peat and mineral soil handling, including specification of equipment to be used;
- measures to be put in place to deal with weather related events (flash floods, peat slide, snow melt, dust);
- appropriate use of track and road material, and other hard-standing material to minimise pollution;
- detail measures to enable sediment management in emergency situations, to cope with high rainfall and runoff;
- scheduling of peat restoration works would be undertaken in line with SPPs and GEMPs, according to agreed methodologies and with guidance and supervision from a suitably experienced ECoW.
- scheduling of construction to benefit site restoration; and
- a record keeping system of what the final PMP will include.

3.2 Monitoring and Record Keeping

3.2.1 An Ecological Clerk of Works (ECoW), experienced in working with peat, would be appointed by the contractor prior to commencement of the construction phase. They would be responsible for monitoring compliance against the final PMP and other relevant documents such as the final CEMP. They would also be responsible for ensuring the legislative requirements are complied with.

3.2.2 The contractor and the ECoW would be responsible for maintaining clear records during the construction phase such as depths and types of peat excavated, plans showing peat storage areas and locations of reinstated peat.

3.3 Peat and Mineral Soil Handling Methods

3.3.1 This section provides guidance to help the contractor in both planning and executing the construction works for the Proposed Development. Working in peat cannot be avoided because parts of the Site is underlain by peat of variable depth and thickness (refer to **EIAR Volume 3a: Figure 10.2: Peat Depths**). Careful handling of the peat would also be required to ensure its suitability for reuse.

3.3.2 The contractor would provide a detailed method statement for works in peat habitats, including but not limited to:

- how to minimise the area of impact;
- how to avoid/work around areas of higher quality vegetation (with the assistance of the ECoW);
- means of access to areas of work and to areas where peat would be reused;
- methods of peat removal;
- managing water in the peat and pollution prevention;
- where to avoid unnecessary intrusive work wherever possible; and
- drainage measures and design and use of appropriate techniques to maintain local hydrology.

3.3.3 It would be necessary for the final PMP to detail the methods and timing involved in handling, storing and using peat for reinstatement. The final method statement for this should be based on the following principles:

- the surface layer of peat and vegetation (acrotelm) would be stripped separately from the catotelmic peat. Where possible this would involve an excavation depth of 0.5 m and the creation of turves;
- the turves should be as large as practicably possible to minimise desiccation effects during storage;
- the turves should be kept wet but not saturated, and not allowed to dry out when in temporary storage;
- contamination of excavated peat with other substrate materials (e.g. gravels, clays or silts) should be avoided and these materials stored separately where excavated;
- acrotelmic material would be stored separately from catotelmic material even if some of this layer appears to be lacking vegetation, since it may contain a seedbank that is useful for re-establishing vegetation;
- any risk of peat slide must be considered by a suitably qualified engineer and where risk is identified protective measures developed and agreed with the Applicant before further construction works take place. Reference should be made to the findings of the PLHRA (**Technical Appendix 10.3, EIAR Volume :**) and subsequent detailed assessment;
- careful handling would be essential to retain any existing structure and integrity of the excavated materials and thereby maximise the potential for excavated material to be reused;
- plan all works to reduce the need for double handling the peat;
- movement of excavated turves and peat should be kept to a minimum and it is preferable to transport peat intended for translocation to its final destination at the time of excavation;
- less humified catotelmic peat (consolidated peat), which maintains its structure upon excavation, should be kept separate from any highly humified amorphous peat;
- consider the timing of excavation activities to avoid very wet weather periods to reduce the risk of peat becoming wet and unconsolidated, thereby reducing pollution or peat slide risk;
- acrotelmic material for reuse within the Site would be replaced as intact as possible once construction is complete; and
- to minimise handling and transportation of peat, acrotelmic and catotelmic materials for re-use within the Site would be replaced, as far as is reasonably practicable, in the location from which it was removed. Acrotelmic material must be placed on the surface.

3.3.4 The handling of peat should be monitored and supervised by the ECoW to ensure the above principles are adopted and implemented during construction of the Proposed Development. Based on the current project programme, it is anticipated that the peat excavation and soil stripping activities would be undertaken at the beginning of the construction period, over an approximate six month period.

3.4 Minimising Damage to Existing Vegetation

3.4.1 To minimise damage to the existing vegetation, construction plant required for reinstatement and landscaping works would be positioned on constructed access tracks, hardstanding areas or existing disturbed areas wherever possible. Areas to be excavated would be clearly marked on the plans and then on the ground to ensure that no work is undertaken outside the construction footprint.

3.4.2 Tracked, low ground-pressure, long reach excavators would be used for peat handling and reinstatement works. A low ground-pressure excavator would be used if the extent of the long reach arm is insufficient. Other machinery, such as tippers, would also be tracked and low-ground pressure type when required to travel on soft ground and the use of ground protection mats could be required.

3.4.3 Reinstatement of vegetation would be focused on natural regeneration utilising peat vegetated turves (acrotelm). In the unlikely event that the quantity of excavated acrotelm turves is not sufficient, a nurse moorland grass seed mix would be used. The species mixture would be specified in the final PMP and could include lowland species to encourage early establishment.

3.5 Planning of Peat Reinstatement

3.5.1 Peat reinstatement and restoration would be undertaken using methods to minimise double handling of peat and the distances between source and receptor areas where practicable. Peat translocation, reinstatement and restoration would be carried out concurrently with other elements of the Proposed Development's construction. To achieve this, a detailed peat restoration plan would be included in the final PMP along with peat management recommendations as per SEPA guidance.

3.5.2 When peat is disturbed or translocated artificially it is prone to drying because fragmentation allows water to drain away and prevents it from accumulating. To create conditions suitable for wet bog restoration, the reinstated peat needs to be kept wet, otherwise, the vegetation would dry out, the peat would shrink and crack, and would ultimately be eroded by water and wind, which would make the restoration unsuccessful and likely to create problems such as peat floods, water pollution, and peat landslides.

3.5.3 The main principle of keeping the water close to the reinstated surface (maintenance of high-water table) is to use natural and artificial enclosures to slow down the horizontal flow of water. For the enclosure to work, the peat surface needs to be flush with or only slightly (<0.3 m) above the level of adjacent land (to allow for settlement). If the level of translocated peat is substantially higher, then it would be at high risk of drying out and easily eroded as water would not be held effectively by the peat alone, it would naturally flow sideways.

3.6 Temporary Peat Storage

3.6.1 During construction temporary peat storage would be required before the excavated material could be re-used in restoration and placed in its end use location.

- The final method statement for this temporary storage of peat would be based on the following guiding principles: temporary storage of peat shall be minimised and where required would be temporarily stored in stockpiles/bunds adjacent to and surrounding each infrastructure site;
- acrotelm, catotelm, and any clay/glacial till or other substrate would be stored separately and appropriately to ensure no mixing of materials and to prevent cross-contamination;

- suitable storage areas shall be sited in areas with lower ecological value, low stability risk areas and at a minimum distance of 30 m from watercourses. Identified suitable areas would form part of the detailed PMP and would be agreed in advance with the ECoW;
- peat turves would be stored in wet conditions where possible (e.g. within waterlogged former excavations) or irrigated in order to prevent desiccation;
- larger stockpiles are preferable to numerous small stockpiles, which minimises exposure to sun and wind, which could lead to desiccation. Stockpiles would not exceed 2 m in height and would be sited with due consideration for slope stability. Benching of stored peat could be necessary to provide stability;
- stores of non-turf, i.e. catotelm, would be bladed off to reduce surface area and desiccation of the stored peat;
- stores of peat, particularly catotelmic material, would be inspected by the Principal Contractor weekly and following heavy rainfall or thaw conditions to check for any evidence of movement, tension cracks or instability in the stored peat. If there is any evidence of instability, appropriate remedial measures would be taken as necessary on the advice from a suitably qualified engineer;
- in dry weather periods, consideration shall be given to watering stored turves and peat to prevent drying out, wastage and erosion;
- pollution prevention measures would be installed around peat storage areas;
- reinstatement would, in all instances, be undertaken at the earliest opportunity to minimise storage of turves and other materials;
- timing the construction and reinstatement work, as much as possible, to avoid periods when peat materials are likely to be wetter; and
- where practical, transportation of peat on the site, from excavation to temporary storage and restoration locations, would be minimised.

4 REINSTATEMENT OF PEAT

4.1 Towers/Tower Foundations

4.1.1 Peat excavated for towers and working areas would be stored as close to the tower as possible, so as to avoid double handling of materials. The construction of the towers involves the excavation of the acrotelm and catotelm, or top, organic layer of peaty soils, and some mineral subsoil. These would be separated on excavation, ensuring no mixing of the different peat layers, and different soil types. Once all the soil has been excavated and the higher bearing underlying subsoil has been reached, the tower foundation would then be constructed.

4.1.2 Up to 50 cm of acrotelm would be used to reinstate the surface vegetation and catotelm re-used to backfill excavations where practicable dependent on the type and depth of the foundation excavation.

4.1.3 Following construction of the tower, turves would be replaced along the excavation/working area edges to allow quicker re-vegetation. Acrotelm turves would be used for this purpose, only where required and would tie in with the surrounding topography, landscape and ground conditions to prevent adverse environmental effects.

4.1.4 Towers located in deep peat would be constructed using a piled foundation solution, where practicable, and it has been assumed that no specific restoration is required.

4.2 Permanent Access Tracks

4.2.1 The reinstatement of peat would be carried out progressively, with peat excavated from other areas placed directly on the sides of the access track. This will take place everywhere where the cut track passes through peat. Surplus peat, not reinstated along the verges, would be either directly translocated to the receptor areas or stored temporarily in designated areas.

4.2.2 The construction of the access track involves the excavation of the acrotelm and catotelm, or top, organic layer of peaty soils, and some mineral subsoil. These would be separated on excavation, ensuring no mixing of the different peat layers, and different soil types. Once all the soil has been excavated and the higher bearing underlying subsoil has been reached, good quality aggregate would then be placed. Up to 50 cm of acrotelm would be used to reinstate the track verges.

4.2.3 Following construction of the section of the access track, turves would be replaced along the road edges to allow quicker re-vegetation and soften visual landscaping of the road edges. Acrotelm turves would be used for this purpose, only where required and would tie in with the surrounding topography, landscape and ground conditions to prevent adverse environmental effects.

4.2.4 Floated access tracks will be used in areas of deep peat, where practicable, and where there is no risk of affecting peat integrity or create risk of peat landslide.

4.3 Temporary Access Tracks

4.3.1 Temporary access tracks would be restored following removal of the stone hardstanding. Peat would be reinstated to be flush with the ground.

4.4 Habitat Restoration Areas

4.4.1 Three potential habitat restoration areas have been identified within the wayleave of the Proposed Development that could be used for ecological and peatland habitat restoration, as shown in **Figure 10.2.1**. This would also be utilised for the re-use of peat excavated as part of the associated Creag Dhubh Substation proposal. As shown in **Figure 10.2.1**, a fourth area has been identified as suitable for accommodating the required volume for temporary peat storage during the construction of the Creag Dhubh Substation. Initial engagement with landowners has been undertaken by the Applicant.

4.4.2 Following submission of the Proposed Development planning application, the Applicant and their contractor will develop a detailed Peat Restoration Plan to include the following key activities:

- further landowner engagement and formal agreements;
- detailed field survey of identified sites;
- production of restoration method statement (including monitoring and maintenance requirements);
- consultation with SEPA and other relevant stakeholders;
- obtain necessary licenses and permissions for peat transportation and restoration; and
- on-going monitoring and maintenance.
- the Applicant would intend to follow the approach and principles implemented in NatureScot's Peatland Action Project[13] to deliver peatland restoration, albeit with site specific measures to work with landowners in developing and delivering successful restoration actions.

4.4.3 The peat surveys undertaken showed that the proposed habitat restoration areas are suitable for receiving peat and are currently either degraded or subject to artificial drainage. Peat would be used for backfilling drainage ditches and other 'cut' features such as haggs and depressions to aid re-wetting.

4.4.4 The EcoW would monitor back filling works to check compliance with relevant documents (such as PMP and CEMP). The main parameters for ditch backfilling would be required are:

- areas with relatively dry peat would be chosen;
- works would be carried out during a period of dry weather;
- specialist low pressure tracked dumpers would be used;
- bog mats would be used where required;
- both source and receptor areas would have good vegetation cover;
- site supervision by the ECoW to ensure access routes to avoid vegetation damage;
- acrotelm excavated from the source location would be kept vegetation side up during transportation; and
- excavated catotelm would be used in ditch back filling shall be of H6-H8[14] level of decomposition.

[13] https://www.nature.scot/climate-change/nature-based-solutions/peatland-action-project

[14] H6 to H8 refers to peat that is 'well decomposed' to 'very strongly decomposed' based on the Von Post scale of humification.

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Area 2:
Areas of class 2 peatland overlain with bracken and marshy grassland – Potential to reinstate as blanket bog.

Area 3:
Coniferous forestry on peaty soil - Potential to reinstate as blanket bog outwith substation site.

Scale @ A3: 1:15,000

0 0.075 0.15 0.3 0.45 0.6 0.75 km

Area Number	Area (m2	Assumed Volume (m3) *
1	35,796.58	7,159.32
2	25,232.99	5,046.60
3	99,790.58	19,958.12

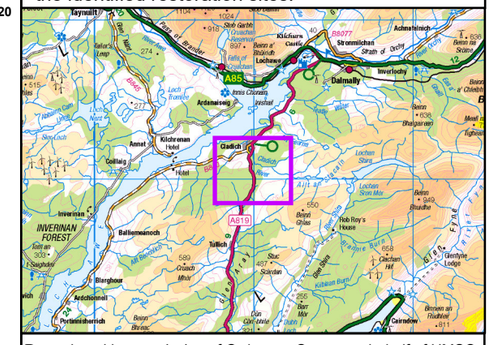
Legend

- Proposed OHL Towers
- Indicative Proposed Alignment
- Creag Dhubh to Dalmally 275kV Connection Operational Corridor (85 m width)
- Proposed Peatland Restoration Areas
- Potential Temporary Peat Storage Site

Phase 1 Habitat

- A1.1.1 Broadleaved woodland - semi-natural
- A1.2.2 Coniferous woodland - plantation
- A4.3 Mixed woodland - recently felled
- B5 Marsh/marshy grassland
- C1.1 Bracken - continuous

*The total volume of peat to be excavated from Creag Dhubh Substation is approx 34,992 m3. The volumes stated in the table are based on spreading peat thinly across the whole area of the identified restoration sites.



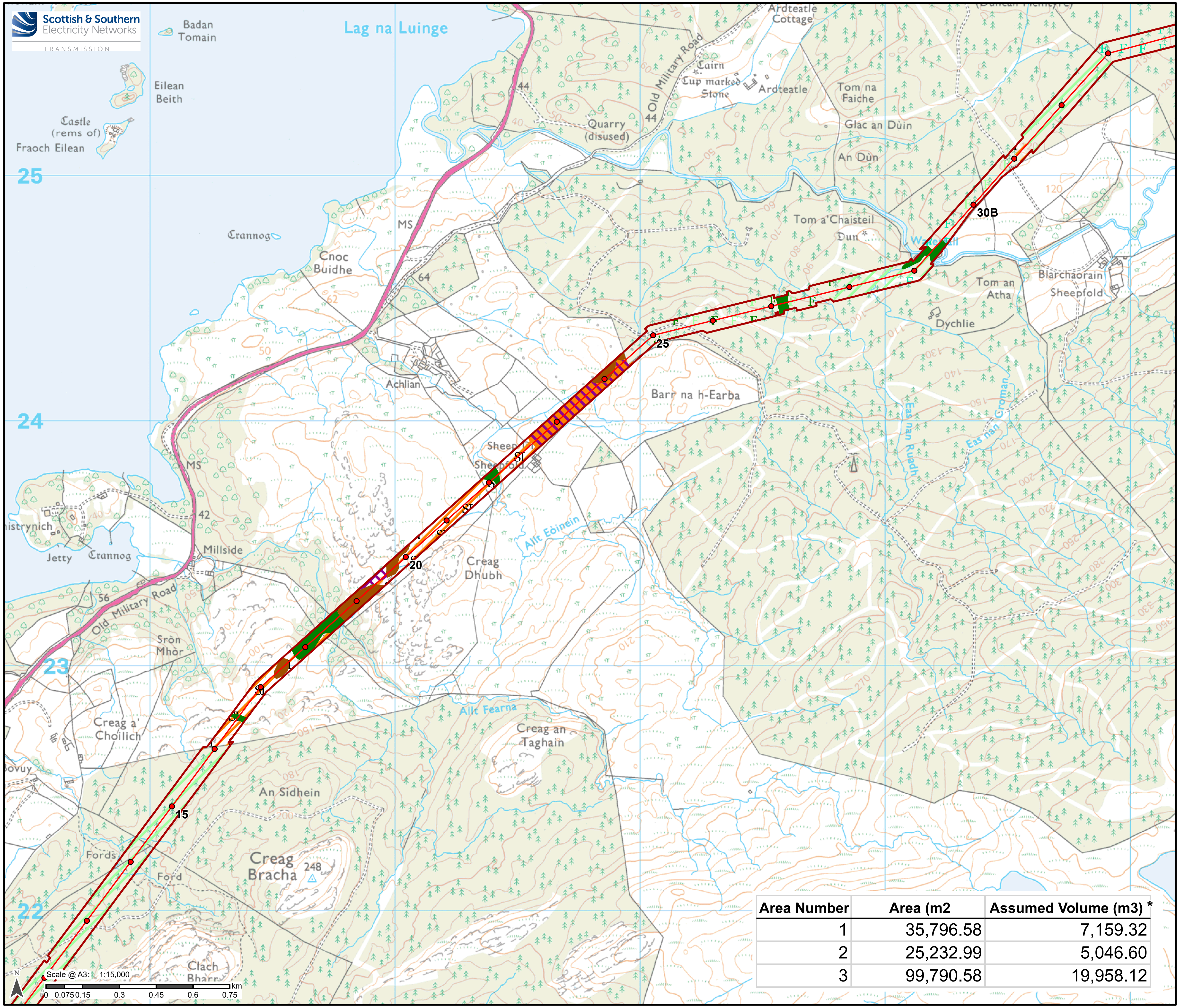
Project No: LT000029
Project: 1700003673

Title:
Creag Dhubh to Dalmally 275 kV Connection

Figure 10.2.1a:
Proposed Peatland Restoration Areas

Drawn by: CF/AB Date: 03/05/2022

Drawing: R170_3673_OHL_EIA_A



Area Number	Area (m2	Assumed Volume (m3) *
1	35,796.58	7,159.32
2	25,232.99	5,046.60
3	99,790.58	19,958.12

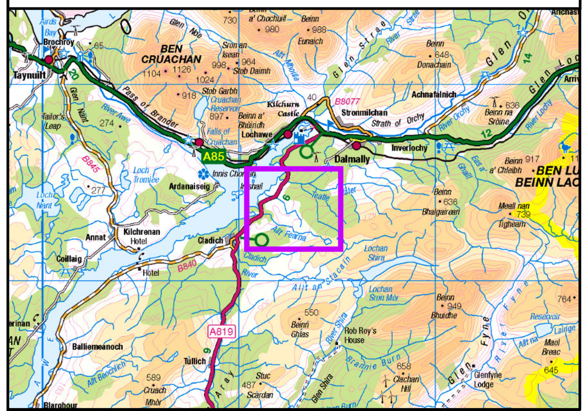
Legend

- Proposed OHL Towers
- Indicative Proposed Alignment
- Creag Dhubh to Dalmally 275kV Connection Operational Corridor (85 m width)

Phase 1 Habitat

- A1.1.1 Broadleaved woodland - semi-natural
- A1.2.2 Coniferous woodland - plantation
- A4.2 Coniferous woodland - recently felled
- A4.3 Mixed woodland - recently felled
- B1.2 Acid grassland - semi-improved
- B5 Marsh/marshy grassland
- C1.1 Bracken - continuous
- E1.7 Wet modified bog

*The total volume of peat to be excavated from Creag Dhubh Substation is approx 34,992 m3. The volumes stated in the table are based on spreading peat thinly across the whole area of the identified restoration sites.



Project No: LT000029
Project: 1700003673

Title:
Creag Dhubh to Dalmally 275 kV Connection

Figure 10.2.1b:
Proposed Peatland Restoration Areas

Drawn by: CF/AB
Date: 03/05/2022

Drawing: R170_3673_OHL_EIA_A

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Strath of Orchy
River Orchy
Eilean a' Phortair
Dalmally Bridge
Edendonich
Upper Kinchrackine
Dalmally
Hotel
Glenview School
Tullich
Craig Lodge
Craig Farm
Croftintuime
Homestead
Bàrr a' Chaistealain
Allt a' Mhuilinn
Leac na Ceardaich
Quarry (disused)
Tom nan Gillean
Barr nan Eireannach
Clach Bharr
Creagan Doire Chuilinn
Barr na Croise
Allt Bhreachdain
Tom a' Mhiridh
An Roinn
Tom Corrain
Brackley
Feadan Fearna
Allt a' Chruaidh-ghrainne
Sheepfold
Creag Dhubh
Uachdar Mhaluidh
Barr an Taghain
Allt Fearna
Allt Mhaluidh
Easan Dubh
Sròn Mhaluidh
Meall Breac
Barr Bothain
Creag a' Mhaol-diridh
Teatle Water
Barran Sheepfold
Waterfall
Blarchaorain Sheepfold
A85
A827
40A
45A
48A
35A

Area 1:
Large areas of blanket bog (Annex 1 habitat) – Majority of this habitat is in poor condition with potential to be improved.

Area Number	Area (m2	Assumed Volume (m3) *
1	35,796.58	7,159.32
2	25,232.99	5,046.60
3	99,790.58	19,958.12

Scale @ A3: 1:15,000
0 0.075 0.15 0.3 0.45 0.6 0.75 km

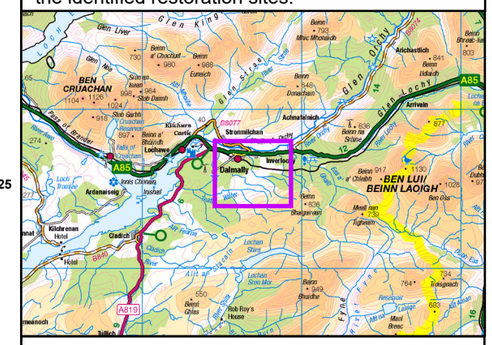
Legend

- Proposed OHL Towers
- Indicative Proposed Alignment
- Creag Dhubh to Dalmally 275kV Connection Operational Corridor (85 m width)
- Proposed Peatland Restoration Areas

Phase 1 Habitat

- A1.1.1 Broadleaved woodland - semi-natural
- A1.1.2 Broadleaved woodland - plantation
- A1.2.2 Coniferous woodland - plantation
- A2.2 Scrub - scattered
- A4.2 Coniferous woodland - recently felled
- A4.3 Mixed woodland - recently felled
- B1.1 Acid grassland - unimproved
- B1.2 Acid grassland - semi-improved
- B5 Marsh/marshy grassland
- D2 Wet dwarf shrub heath
- E1.6.1 Blanket sphagnum bog
- E1.7 Wet modified bog
- E2.1 Flush and spring - acid/neutral flush
- E2.2 Flush and spring - basic flush

*The total volume of peat to be excavated from Creag Dhubh Substation is approx 34,992 m3. The volumes stated in the table are based on spreading peat thinly across the whole area of the identified restoration sites.



Project No: LT000029
Project: 1700003673

Title:
Creag Dhubh to Dalmally 275 kV Connection

Figure 10.2.1c:
Proposed Peatland Restoration Areas

Drawn by: CF/AB Date: 03/05/2022

Drawing: R170_3673_OHL_EIA_A