



Technical Appendix 9.2: Peat Management Plan

Glendye Wind Farm Overhead Line Grid Connection

Scottish & Southern Electricity Networks (SSEN) Transmission

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Basis of Report

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1.0 Introduction

1.1 General

SLR Consulting Ltd (SLR) was commissioned by Scottish & Southern Electricity Networks (SSEN) Transmission (the Applicant), to undertake a Stage 1 Outline Peat Management Plan (PMP) at the proposed Glendye Wind Farm Overhead Line Grid Connection (hereafter referred to as the “Proposed Development”). The location and layout of the Proposed Development are detailed on **Figure 9.1.1** and **Figure 9.1.2** with the red line defining ‘the site boundary’.

The assessment has been undertaken in line with best practice guidance¹ published by the Scottish Environment Protection Agency (SEPA) and wind farm construction good practice guidance² (where relevant to Overhead Line (OHL) projects).

The work has been undertaken by a team of Geotechnical Engineers and Geologists, with over 10 years’ experience in undertaking peat assessments. The team was led by a Chartered Hydrogeologist with 30 years’ consultancy experience and specialising in the assessment of soils, geology and water for renewable power projects in Scotland.

The report should be read in conjunction with **Chapter 9: Geology, Hydrology and Hydrogeology** and the following Technical Appendices:

- Technical Appendix 9.1: Peat Landslide Hazard and Risk Assessment (PLHRA).
- Technical Appendix 9.3: Peatland Condition Assessment (PCA).

1.2 Proposed Development

The Proposed Development is driven by the need to connect the consented Glendye Wind Farm to the electricity transmission network at Fetteresso substation. The Proposed Development would comprise of approximately 19 km of new single circuit 132 kV overhead line (OHL), supported by steel trident poles. New permanent and temporary access tracks would also be required to facilitate the construction and operation of the Proposed Development.

Full details of the Proposed Development are provided in **Chapter 3: The Proposed Development** of the EIA Report.

1.3 Objectives

This Stage 1 Outline PMP outlines the overall approach of minimising disruption to peatland, and it aims to ensure that all further opportunities to minimise peat disturbance and extraction would be taken during detailed design and construction of the Proposed Development.

This PMP has been developed to demonstrate that peat has been afforded significant consideration during the design phase of the Proposed Development and would be afforded significant consideration should consent be granted. Specifically, it shows with the benefit of site specific peat probing data, how areas of deeper peat have been avoided where technically feasible and how shallow deposits of peat and soils can be safeguarded and used to support the long-term habitat restoration and management proposals.

¹ Scottish Government, Scottish Natural Heritage, SEPA., (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only.

² NatureScot (July 2024), Good Practice During Wind Farm Construction. <https://www.nature.scot/doc/good-practice-during-wind-farm-construction>



1.4 Role of the Peat Management Plan

The PMP is intended to be a working document to be used throughout the key stages of the design, construction, operation and re-instatement phases of the Proposed Development, as part of an overall Construction Environmental Management Plan (CEMP). These stages are outlined below.

Stage 1: Environmental Impact Assessment (EIA)

This report forms the Outline PMP and is submitted as part of the EIA Report. From this initial report the PMP will be developed further into a Stage 2 Pre-Construction PMP.

Stage 2: Post Consent / Pre-Construction

The peat mass balance calculations may be further developed prior to the works commencing, following detailed ground investigation or further survey works required to inform detailed design, or that may be required under planning consent conditions.

Stage 3: Construction Stage

Actual peat volumes excavated during construction will be recorded against the overall predicted volumes. Within micro-siting allowances, the alignment and design of tracks, poles and associated construction methods will be reviewed to avoid/minimise peat disturbance as much as possible considering the more detailed information available once construction commences. A regular review and update of the peat mass balance table will be undertaken by the appointed Principal Contractor (PC) and monitored by the Ecological Clerk of Works (ECoW) on-site and made available to regulators as required.

1.5 Legislation and Guidance

The PMP has been compiled in accordance with the following legislation and best practice guidance:

- National Planning Framework for Scotland 4 (NPF4) (Scottish Government, February 2023)³;
- Scottish Government, Scottish Natural Heritage, SEPA (2014) 'Peat Survey Guidance; Developments on Peatland: Site Surveys'⁴;
- SEPA Regulatory Position Statement - Developments on Peat (Scottish Environment Protection Agency, 2010)²;
- NatureScot (July 2024), Good Practice During Wind Farm Construction⁵;
- Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste (Scottish Renewables and SEPA, 2012)⁶;
- The Waste Management Licensing (Scotland) Regulations 2011⁷;
- Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Scottish Government, January 2017)⁸; and

³ Scottish Government (2023). <https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2022/11/national-planning-framework-4-revised-draft/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4-revised-draft.pdf>

⁴ Scottish Natural Heritage (SNH), SEPA, Scottish Government & James Hutton Institute. (2014) 'Peat Survey Guidance; Developments on Peatland: Site Surveys'.

⁵ NatureScot (July 2024), Good Practice During Wind Farm Construction. <https://www.nature.scot/doc/good-practice-during-wind-farm-construction>

⁶ Scottish Renewables, Scottish Environment Protection Agency. 2012. Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste

⁷ Scottish Government 2011, The Waste Management Licensing (Scotland) Regulations 2011. <https://www.legislation.gov.uk/sdsi/2011/9780111012147/contents>

⁸ Peat Landslide Hazard and Risk Assessments (Scottish Government, April 2017)



- Floating Roads on Peat - Report into Good Practice in Design, Construction and Use of Floating Roads on Peat with reference to Wind Farm Developments in Scotland (Forestry Commission Scotland & Scottish Natural Heritage, 2010)⁹.

Requirements of National Planning Policy 4

The intent of Policy 5 (Soils) of National Planning Policy 4 (NPF4)³ is “to protect carbon rich soils, restore peatlands and minimise the disturbance of soils from development”.

The Policy states [5(a)] that development proposals should only be supported if they are designed and constructed:

- in accordance with the mitigation hierarchy by first avoiding and then minimising the amount of disturbance to soils on undeveloped land; and
- in a manner that protects soils from damage including from compaction and erosion, and that minimises soils sealing”.

Further [5(c)] confirms “that development proposals on peatland, carbon rich soils, and priority peatland will only be supported if they are:

- essential infrastructure and there is a specific locational need and no other suitable site;
- the generation of energy from renewable sources that optimises the contribution of the area to greenhouse gas emissions reductions targets;
- small-scale development directly linked to a rural business, farm or croft;
- supporting a fragile community in a rural or island area; or
- restoration of peatland habitats”.

And [5(d)] confirms “that where development on peatland, carbon-rich soils or priority peatland habitat is proposed, a detailed site specific assessment will be required to identify:

- the baseline depth, habitat condition quality and stability of carbon rich soils;
- the likely effects of the development on peatland, including on soil disturbance; and
- the likely net effects of the development on climate emissions and loss of carbon”.

Policy 5 also confirms that the site specific (above) assessment [5(d)] “should inform careful project design and ensure, in accordance with relevant guidance and the mitigation hierarchy, that adverse impacts are first avoided and then minimised through best practice. A peat management plan will be required to demonstrate that this approach has been followed, alongside other appropriate plans required for restoring and/ or enhancing the site into a functioning peatland system capable of achieving carbon sequestration”.

Mitigation Hierarchy

SEPA has published guidance regarding the mitigation hierarchy for developments on peat which is summarised below:

- Prevention – avoiding generating excess peat during construction (e.g. by avoiding peat areas or by using construction methods that do not require excavation such as floating tracks);
- Re-use – use of peat produced on-site in restoration, provided that its use is fully justified and suitable;

⁹ Scottish Natural Heritage, Forestry Commission (August 2010). Floating Roads on Peat



- Recycling / Recovery / Treatment – modify peat produced on-site for use as fuel, or as a compost / soil conditioner, or dewater peat to improve its mechanical properties in support to re-use; and
- Storage – applying the SEPA guidance, storage of peat up to a depth of 2 m is not classified as a waste; however, clarification should be sought from the waste regulator prior to re-use and care must be taken to ensure that it does not cause environmental pollution.



2.0 Baseline Conditions

2.1 Definition of Peat

Peat is defined as an organic soil comprising the partly decomposed plant remains that have accumulated in-situ, rather than being deposited by sedimentation. When peat forming plants die, they do not decay completely as their remains become waterlogged due to regular rainfall. The effect of waterlogging is to exclude air and hence limit the degree of decomposition. Consequently, instead of decaying to carbon dioxide and water, the partially decomposed material is incorporated into the underlying material and the peat 'grows' in-situ.

The Scottish Government Peat Landslide Hazard Best Practice Guide (2017)⁸ uses the following Joint Nature Conservation Committee (JNCC) report 455 'Towards an Assessment of the State of UK Peatlands'¹⁰ definition for classification of peat deposits:

- Peaty (or organo-mineral) soil: a soil with a surface organic layer less than 0.5 m deep;
- Peat: a soil with a surface organic layer greater than 0.5 m deep which has an organic matter content of more than 60 %; and
- Deep Peat: a peat soil with a surface organic layer greater than 1.0 m deep.

Peat is characterised by low density, high moisture content, high compressibility and low shear strength, all of which are related to the degree of decomposition and hence residual plant fabric and structure. To some extent, it is this structure that affects the retention or expulsion of water in the system and differentiates one peat from another.

Lindsay¹¹ defined two main types of peat bog, raised bog and blanket bog, which are prevalent on the west coast of Europe along the Atlantic seaboard. In Britain, the dominant peatland is blanket bog which occurs on the gentle slopes of upland plateaux, ridges and benches and is predominantly supplied with water and nutrients in the form of precipitation. Blanket peat is usually considered to be hydrologically disconnected from the underlying mineral layer.

There are two principal types of peat in a near natural peatland (see **Plate 1 below**):

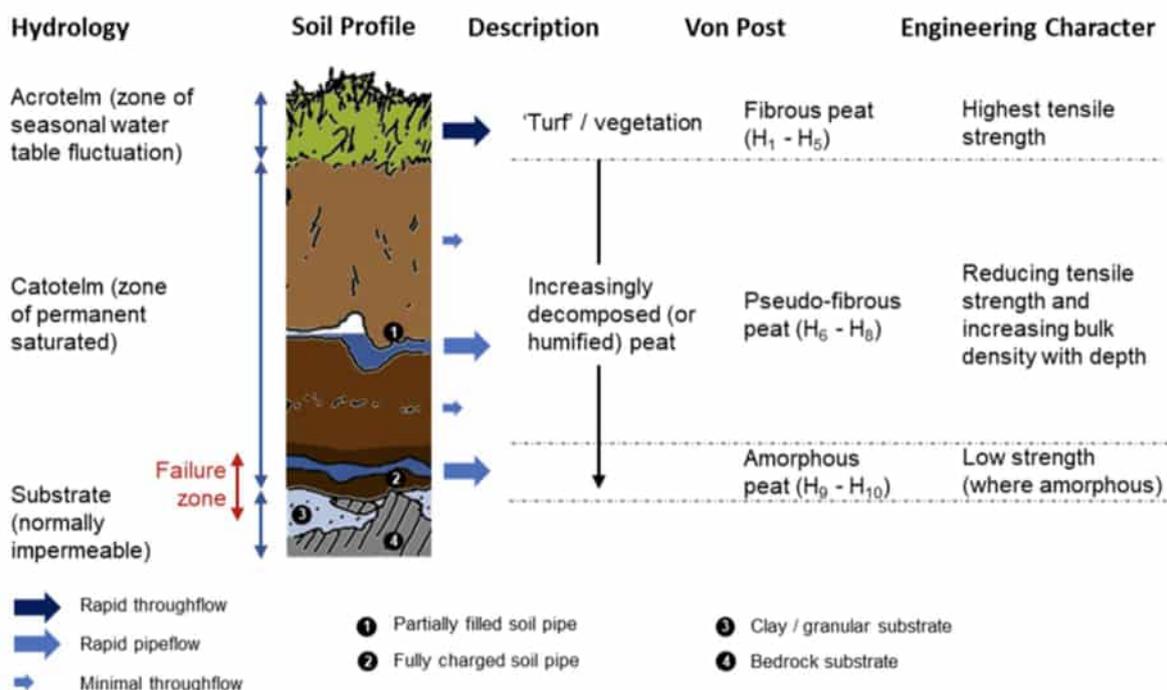
- The upper (acrotelm) layer in which the water table fluctuates, which is fibrous and comprises plant roots etc. The acrotelm is relatively dry and has some tensile strength and its thickness typically ranges from 0.1 m to 0.6 m deep; and
- The lower (catotelm) layer, which is saturated, sitting permanently below the water table. The catotelm layer is highly decomposed, generally becoming more amorphous/liquid in nature and losing structure with increasing depth. The structure of catotelmic peat tends to disrupt completely on excavation and handling.

¹⁰ JNCC. 2011. Towards an assessment of the state of UK peatlands, JNCC Report No. 445, JNCC, Peterborough, ISSN 0963-8091.

¹¹ Lindsay, R.A., (1995), 'Bogs: The ecology, classification and conservation of Ombrotrophic Mires.' Scottish Natural Heritage, Perth.



Plate 1 - Typical Peat Profile¹²



The acrotelm is the fibrous surface to the peat bog¹³, typically less than 0.6 m thick, which exists between the growing bog surface and the lowest position of the water table in dry summers.

For geotechnical purposes the degree of decomposition (humification) can be estimated in the field by applying the 'squeezing test' proposed by Von Post and Grunland¹⁴ (1926) and as shown above in Plate 1. The humification value ranges from H1 (no decomposition) to H10 (highly decomposed). The extended system set out by Hobbs¹⁵ provides a means of correlating the types of peat with their physical, chemical and structural properties.

The relative position of the water table within the peat controls the balance between accumulation and decomposition and therefore its stability, hence artificial adjustment of the water table by drainage requires careful consideration.

2.2 Study Area

The study area encompasses the area over which all desk-based and field data were gathered to inform the assessment presented in this Chapter, as shown on **Figures 9.1 to 9.8**. This includes a buffer of 500 m of the proposed overhead line (OHL) and new, temporary and existing access tracks that would be constructed or upgraded to facilitate construction and maintenance of the Proposed Development, as agreed with consultees at the scoping stage of the Proposed Development. Beyond this distance, any effect is considered to be so diminished as to be undetectable and therefore not significant. Beyond this distance, any effect is considered to be so diminished as to be undetectable and therefore not significant.

¹² Mills, A.J. and Rushton, D. 2023. A risk-based approach to peatland restoration and peat instability. NatureScot Research Report 1259.

¹³ Ingram, H.A.P., (1978), 'Soil layers in mires: function and terminology'. Journal of Soil Science, 29, 224-227.

¹⁴ Von Post, L. and Grunland, E., (1926), 'Sodra Sveriges torvillganger 1' Sverges Geol. Unders. Avh., C335, 1-127.

¹⁵ Hobbs, N.B., (1986), 'Mire morphology and the properties and behaviour of some British and foreign peats.' Quarterly Journal of Engineering Geology, London, 19, 7-80.



2.3 Topography

From review of OS mapping, the topography across the Proposed Development is generally at moderate elevations (approximately 300 m AOD on average). There are steeply sloped hillsides to the north of the western extent of the Proposed Development with Meluncart hill at 525 m AOD. The eastern extent of the Proposed Development features steeply sloped forested hillsides at Scare Hill (305 m AOD) and Boy's Hill (326 m AOD). The eastern areas of the Proposed Development are situated within agricultural fields and areas of rough grazing reaching a peak of approximately 250 m AOD at Hill of Quithel.

2.4 Geology

2.4.1 Artificial Ground

Based on the information available from the British Geological Survey (BGS) Geoindex¹⁶, no made ground deposits are noted across the Proposed Development.

2.4.2 Superficial Geology

The BGS Geoindex¹⁶ indicates that the majority of the western extent of the Proposed Development is underlain by peat up to and including Goyle Hill. There are also minor deposits of glacial till and alluvium in the western extent near Brae of Fawnyard. The majority of the eastern extent of the Proposed Development is absent of any superficial deposits, with minor pockets of peat and glacial till. Alluvium is also recorded adjacent to the banks of larger watercourses (Water of Charr, Bervie Water and Carron Water). The areas of peat are mapped at Hill of Quithel and at Foggy Moss.

2.4.3 Bedrock Geology

The BGS Geoindex¹⁶ indicates that the Proposed Development is generally underlain by pelites, semipelites, psammites of the Glen Effock Schist Formation and Glen Lethnot Grit Formation.

The north-west extent of the site, including two poles (127 and 128), is underlain by igneous granitic bedrocks of the Water of Dye Granite (Mount Battock Pluton). Part of the south-east of the site is underlain by sedimentary rocks comprising conglomerate and sandstones of the Arbuthnott Garvock Group and Carron Sandstone Formation.

Minor flowing intrusions are noted across the Proposed Development:

- Microgranite, Feldspar-Phyric, Quartz-Feldspar-Porphry, Microgabro and Porphyritic deposits of the North Britain Siluro-Devonian Calc-Alkaline Dyke Suite;
- Quartzite deposits of the Glen Effock Schist Formation; and
- Quartz-Microgabro deposits of the Central Scotland Late Carboniferous Theolitic Dyke Swarm.

2.5 Peatland Classification

The Carbon and Peatland Map 2016¹⁷ indicates that the western extent of the Proposed Development, from the proposed Glendye Substation and underground cable (UGC) route¹⁸ to Pole 114 alongside areas underlying Poles 112, 111 & 013-009 are potentially Class 1 & 2

¹⁶ BGS Online Viewer, available at [https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.133433804.376188765.1646739904-1030004651.1646739904]

¹⁷ NatureScot, Carbon and Peatland Map 2016, Available online at: map.environment.gov.scot/soil_maps/

¹⁸ Undertaken utilising the Applicant's permitted development rights.



priority peatland, considered nationally important carbon-rich soils, deep peat and priority peatland habitat. Class 4 peatland is indicated to potentially underly much of the eastern extent of the Proposed Development including Poles 001-008, 014-050, 89-110 & 113. This class is noted to lack dominant priority peatland habitat cover with fragmented occasional areas of habitat and deep peat possibly present. The remaining areas of the Proposed Development are noted to be underlain by mineral soils with no peat deposits likely.

2.6 Peatland Geomorphology

Peat was encountered throughout the Proposed Development, with deposits generally associated to flatter expanses, breaks in slope and hollows that allow for the accumulation and formation of peatland (**Photo 1** and **Photo 2** below). Peat greater than 2 m was largely confined to the central and western areas of the Proposed Development. Peat is largely absent across the eastern extent of the Proposed Development, with most of this area being situated within sloped, artificially drained plantation forestry. Eastern extents are also located in agricultural land where the area has been extensively drained.

Photo 1: Deep peat of >3 m present within flatter expanse at Pole 149. Taken from NGR: NO 64612 81484 looking west.



Photo 2: Peat constrained to hollow east of Pole 132. Taken from NGR: NO 66413 81593 looking east.



Erosional features were commonly encountered during site surveys, especially in the west of the Proposed Development where the peatland was dominated by hagged and vegetated gulleys (**Photo 3**, below). Peat hagsgs up to 3 m in height were observed with bare substrate at the bases. The central areas of the Proposed Development (east of the B974) also featured extensive erosional features to the south-west of Goyle Hill, with peat hagsgs at around 1.5 m recorded. In addition, there are some areas of peatland which have been heavily influenced by wind erosion across higher elevations to the north-west of the Proposed Development at Rough Bank.

A detailed assessment of peatland condition has been undertaken within **Technical Appendix 9.3: Peatland Condition Assessment**.



Photo 3: Peat hags to the north of Pole 154. Taken from NGR: NO 64239 81218 looking east.



From review of aerial photography and site walkovers, the eastern extent of the Proposed Development features extensive mixed agricultural land use. The agricultural practices are split between pastoral, rough grazing and crop cultivation. Areas of improved pasture were well drained by extensive anthropogenic ditches.

2.7 Hydrogeology

Information from Scotland's environment map¹⁹ indicates that the peat and glacial till deposits within the study area are not considered a significant aquifer. The alluvial deposits, where present, are considered to be a moderate to high productive aquifer with intergranular flow.

It also confirms the igneous and metamorphic bedrock which underlies the majority of the Proposed Development are classified as low productivity aquifers, whereby small amounts of groundwater are expected in near surface weathered zones and secondary fractures. The sedimentary bedrocks which underlie part of the south eastern extent of the Proposed Development are classified as a moderate productivity aquifer which can locally yield moderate amounts of groundwater.

2.8 Hydrology

Information from SEPA's Water Classification Hub²⁰ indicate the western extent of the Proposed Development is located within the River Dee catchment, specifically the Water of Dye sub catchment. The Water of Dye flows generally eastward and northwards to the north of the Proposed Development before discharging into the River Dee approximately 10 km north of the Proposed Development.

A small part of the centre of the Proposed Development, including poles 101 to 114 and 131 to 134, are located within the River North Esk surface water catchment, specifically within the upper reaches of the Luther Water sub catchment.

¹⁹ Scotland's Environment, Scotland's Environment Map, Available online at: <https://map.environment.gov.scot/sewebmap/>

²⁰ SEPA, Water Classification Hub, available online at: <https://www.sepa.org.uk/data-visualisation/water-classification-hub/>



The remainder of the Proposed Development is located within three surface water catchments:

- Part of the eastern extent of the Proposed Development, including poles 37 to 100, is located within the Bervie Water surface water catchment. The Bervie Water flows generally south eastwards from the Proposed Development before discharging into the North Sea at Inverbervie. The Bervie Water and three tributaries of the Bervie Water (Burn of Brumlieshank, Maxie Burn and Burn of Guinea and their tributaries) cross the Proposed Development.
- The eastern most extent of the Proposed Development, including poles 1 to 36, is located within the Carron Water surface water catchment. The Carron Water flows eastwards from the Proposed Development before discharging into the North Sea at Stonehaven. Several tributaries of the Carron Water, including the Burn of Annamuick, cross the Proposed Development.
- Part of the north eastern extent of the Proposed Development is located within the Cowie Water surface water catchment, however no development is proposed within this area.



3.0 Fieldwork

3.1 Peat Surveys

Peat surveys were carried out in accordance with best practice guidance for developments on peatland^{21,22}. Phase 1 peat probing was conducted on a 100 m grid to allow for initial assessment of the Proposed Development which will be used in future preliminary site layout designs. Phase 2 probing saw detailed probing undertaken across the Proposed Development layout, focussing on pole locations, temporary access track, permanent access tracks and other site infrastructure. Phase 2 probing was typically undertaken on linear infrastructure (permanent / temporary tracks) at 50 m spacings with offset probing locations either side (approximately 10 m to 25 m). Infrastructure (pole locations etc.) was typically probed at 10 m grid spacings where areas of peat >0.5m was recorded.

Where surveys were undertaken, the thickness of the peat was assessed using a graduated peat probe, approximately 6 mm diameter and capable of probing depths of up to 10 m. This was pushed vertically into the peat to refusal and the depth recorded, together with a unique location number and the co-ordinates from a handheld Global Positioning System instrument (GPS). The accuracy of the GPS was quoted as ± 2 m, which was considered sufficiently accurate for this survey. All data was uploaded into a GIS database for incorporation into various drawings and analysis assessments.

Where the peat probing met refusal on a hard substrate, the 'feel' of the refusal can provide an insight into the nature of the substrate. The following criteria were used to assess material:

- Solid and abrupt refusal – rock;
- Solid but less abrupt refusal with grinding or crunching sound – sand or gravel or weathered rock;
- Rapid and firm refusal – clay; or
- Gradual refusal – dense peat or soft clay.

The relative stiffness of the peat was also assessed from the resistance to penetration of the probe and from the effort required to extract the probes (retrieval of the probe was often impossible for one person). In all instances refusal was met on obstructions, allowing identification of subsurface geology.

3.2 Peat Depth

As detailed in Section 2.1, Peat is generally defined as a soil with a surface organic layer in excess of 0.5 m²¹. Where the probing recorded peat less than 0.5 m thick, it is considered to be a peaty soil (or organo-mineral soil). Soils with a peaty organic horizon over mineral soil are often referred to as 'peaty soils'. These organo-mineral soils are extensive across the UK uplands, but do not meet recognised definitions of peat, as they are either shallower than true peat or have a lower carbon density.

A total of 17,075 peat probes were undertaken across all survey phases. Table A, below, summarises the peat probing results below. The average thickness of peat recorded across the Proposed Development was 0.6 m.

²¹ Scottish Renewables & SEPA (2012) 'Developments on Peatland Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste'.

²² Scottish Natural Heritage (SNH), SEPA, Scottish Government & James Hutton Institute. (2014) 'Peat Survey Guidance; Developments on Peatland: Site Surveys'.



Table A: Peat Probing Results

Peat Thickness (m)	No. of Probes	Percentage (of total probes undertaken on-site)
0 (no peat)	129	0.8
0.01 – 0.49 (peaty soil)	11695	68.5
0.50 – 0.99	1239	7.3
1.00 – 1.49	1265	7.4
1.50 – 1.99	1389	8.1
2.00 – 2.49	788	4.6
2.50 – 2.99	279	1.6
3.00 – 3.49	165	1.0
3.50 – 3.99	82	0.5
> 4.0	44	0.3

3.3 Peat Coring

Peat is described using the Code of Practice for Ground Investigations BS5930²³ and the Von Post Scale²⁴. Six peat cores were collected by SLR using a peat auger during Phase 2, to inform interpretations of the underlying physical peat condition and underlying substrate. Peat samples were undertaken to depths of between 0.8 and 3 mbgl. The peat cores recorded fibrous to pseudo-fibrous condition.

Peat condition across the Proposed Development was assessed during the Peatland Condition Assessment which was undertaken alongside peat depth surveys. The results of this survey are discussed within **Technical Appendix 9.3 Peatland Condition Assessment**.

²³ BS 5930:2015+A1:2020, Code of practice for ground investigations

²⁴ Von Post, L. and Grunland, E., (1926), 'Sodra Sveriges torvillganger 1' Sverges Geol. Unders. Avh., C335, 1-127.



Table B: Peat Coring Results

Location ID	Depth (mbgl)	Von Post Degree of Decomposition	Description
HA01:	GL - 1.0	H3, B3	Brown fibrous PEAT
HA02:	GL - 0.8 0.8 - 1.3 1.3 - 2.3 2.3 - 3.0	H2, B4 H3, B3 H4, B3 H5, B3	Brown fibrous PEAT Brown pseudo-fibrous PEAT Brown pseudo-fibrous PEAT Dark brown pseudo-fibrous PEAT
HA03:	GL - 0.5 0.5 - 1.2 1.2 - 1.5	H2, B3 H3, B3 H4, B3	Brown fibrous PEAT Brown fibrous PEAT Brown pseudo-fibrous PEAT
HA04:	GL - 0.8	H4, B2	Dark brown pseudo-fibrous PEAT
HA05:	GL - 0.7 0.7 - 1.2 1.2 - 1.5	H3, B3 H4, B3 H5, B3	Brown fibrous PEAT Brown pseudo-fibrous PEAT Dark brown pseudo-fibrous PEAT
HA06:	GL - 0.8 0.8 - 1.5 1.5 - 2.0	H3, B3 H4, B3 H5, B3	Brown fibrous PEAT Brown pseudo-fibrous PEAT Brown pseudo-fibrous PEAT

Peat core logs and photographs are presented within **Annex B**.



4.0 Peat Management and Mitigation

The Proposed Development design took account of a number of environmental and technical constraints. The design sought to avoid areas of thick peat where technically feasible, whilst taking into account other environmental and technical factors such as ecology, ornithology, archaeology, hydrology, topography and existing infrastructure. The Proposed Development design evolution has sought to avoid areas where peat is >1 m; however, there are areas where infrastructure is located on areas of peat >1 m due to topographical and other constraints.

The areas of both permanent and temporary infrastructure within the Proposed Development which are on areas of deep peat >1 m will require mitigation. The main mitigation will be further micro-siting of poles and infrastructure, to minimise excavation of peat during the construction phase.

Where peat and peaty soils are to be excavated, re-used or reinstated, the following good practice applies to protect carbon rich soils and mitigate impacts to peat.

4.1 Excavation

Excavated peat should be excavated as turves, including the acrotelm (surface vegetation) and a layer of adjoining catotelm (more humified peat) typically up to 0.5 m thick in total, or as blocks of catotelm; the acrotelm should not be separated from its underlying peat;

- the turves should be as large as possible to minimise desiccation during storage, though the practicalities of handling should be considered;
- the mixing of excavated peat with substrate materials to be avoided at all times; and
- consider timing of excavation activities to avoid very wet weather and avoid multiple handling to minimise the likelihood of excavated peat losing structural integrity.

If possible, extract intact full depth acrotelm layers from the top surface of the peat deposit. This technique will maintain connectivity between the surface vegetation and the partially decomposed upper layers of the catotelm.

4.2 Re-use

It is anticipated that the volume of material excavated for the construction of the Proposed Development can be entirely reused for a variety of restoration purposes, including around constructed structures, restoration of temporary hardstanding areas and road verges. There is also potential for excavated peat to be used for habitat and peat restoration on or locally to the Proposed Development. This potential re-use option has not been quantified but will provide an additional method to retain and beneficially re-use material. Further details are provided in Section 5.0.

4.3 Storage

The following good practice applies to the storage of peaty soils/peat:

- stripped materials should be carefully separated to keep peat and other type of soils apart;
- to minimise handling and haulage distances, excavated material should be stored local to the site of excavation or end point of restoration;
- peat turves should be stored in wet conditions or irrigated in order to prevent desiccation (once dried, peat will not rewet);



- stockpiling of peat should be in large volumes to minimise exposure to wind and sun (and desiccation), with due consideration for slope stability, but should not exceed 1 m in height to maintain stability of stockpile;
- where deemed appropriate, peat should be placed on a geotextiles mat to aid the stability of the stockpiled material.
- stockpiles should be isolated from watercourses or drains with appropriate bunding to minimise pollution risks;
- to be stored a minimum of 10 m from any watercourse.
- stores of non-turf (catotelm) peat should be bladed off to reduce the surface area and desiccation of the stored peat; and
- peat storage areas should be monitored during periods of very wet weather, or during snowmelt, to identify early signs of peat instability.

Any peaty soils/peat to be removed during construction would require a temporary storage area near to the construction works/area of re-use. Where peat cannot be transferred immediately to an appropriate restoration area, short term storage will be required. In this case, the following good practice applies:

- peat should be stored around the excavation perimeter at sufficient distance from the cut face to prevent overburden induced failure;
- local gullies, diffuse drainage lines (or very wet ground) and locally steep slopes should be avoided for peat storage;
- drying of stored peat should be avoided by irrigation or by seeding (although this is unlikely to be significant for peat materials stored for less than 2 months);
- peat generated from permanent excavations should be transported directly to its allocated restoration location, to minimise the volume being stockpiled with the possibility of drying out;
- stores of catotelm peat should be bladed off to reduce their surface area and minimise desiccation;
- where transport cannot be undertaken immediately, stored peat should be irrigated to limit drying and stored on a geotextile mat to promote stability; and
- monitoring of large areas of peat storage during wet weather or snowmelt should be undertaken to identify any early signs of peat instability.

4.4 Transport

The following good practice applies to transport:

- movement of turves should be kept to a minimum once excavated, and therefore it is preferable to transport peat planned for translocation and reinstatement to its destination at the time of excavation; and
- if heavy goods vehicles (HGVs)/dump trucks that are used for transporting non-peat material are also to be used for peat materials, measures should be taken to minimise cross-contamination of peat soils with other materials.

4.5 Handling

Following refinement of the peat model, a detailed storage and handling plan should be prepared forming part of the detailed CEMP, including details of:



- best estimate excavation volume at each infrastructure location (including peat volumes split into area/volume of 'acrotelm' or 'turf', and volume of catotelm) which would be achieved by undertaking additional probing in line with current guidance;
- volume to be stored locally and volume to be transferred directly on excavation to restoration areas elsewhere (e.g. peat storage areas), in order to minimise handling;
- location and size of storage area relative to infrastructure locations and natural peat morphology / drainage features; and
- irrigation requirements and methods to minimise desiccation of excavated peat during short term storage.

These parameters are best determined post-consent, informed by detailed ground investigation with the micro-siting areas for each element of infrastructure.

4.6 Restoration

The methodologies detailed in any future restoration scheme should be followed, as well as the following best practice:

- carefully evaluate potential restoration sites, such as peat storage areas for their suitability, and agree that these sites are appropriate with the ECoW, landowners and relevant consultees;
- undertake restoration and revegetation or reseedling work as soon as practically possible;
- where required, consider exclusion of livestock from areas of the Proposed Development undergoing restoration, to minimise impacts on revegetation; and
- as far as reasonably practicable, restoration will be carried out concurrently with construction rather than at its conclusion.

4.7 Access Tracks

There is guidance^{5,9} available to support access track design in peatlands. Guidance is generally focused on floating tracks and excavated tracks and is summarised below.

Floating tracks may be considered on suitable length sections of access track, where peat depths are >0.5 m and where detailed ground investigation confirms suitability.

Excavated tracks require complete excavation of soil/peat to a competent substrate. Excavated tracks will generally be undertaken where peat depths are less than 0.5 m. This peat/soil would require storage ahead of re-use elsewhere within Proposed Development. Good practice guidance relates mainly to drainage in association with excavated tracks:

- trackside ditches should capture surface water (within the acrotelm) before it reaches the road;
- interceptor drains should be shallow and flat bottomed (and preferably entirely within the acrotelm to limit drawdown of the water table);
- any stripped peat turves should be placed back in the invert and sides of the ditch to assist regeneration and prevent erosion to the peat and wash out that could occur; and
- culverts and cross drains should be installed under excavated tracks to maintain subsurface drainage pathways (such as natural soil pipes or flushes). Discharge from constructed drainage should allow for as much diffuse dispersion of clean (silt free) water as possible, while minimising disturbance to existing peatland as far as possible.



Silt mitigation measures will be incorporated into all constructed drainage as per the requirements of the CEMP.

Although excavation is normally undertaken in peat of minor thickness (< 1.0 m), there is a possibility of minor slippage from the cut face of the peat mass. Accordingly:

- free faces should be inspected for evidence of instability (cracking, bulging, excessive discharge of water or sudden cessation in discharge); and
- where significant depths of peat are to be stored adjacent to an excavation, stability analysis should be conducted to determine Factor of Safety (FoS) and an acceptable FoS adopted for loaded areas.

Regular routine monitoring should be scheduled post-construction to ensure that hydrological pathways and track integrity have been suitably maintained.

4.8 Monitoring and Inspection

There would be frequent, routine and regular inspections of peat in all stockpiles and temporary storage areas as part of the PMP audit process. Inspections would assess in situ peat physical conditions, integrity of containment and temporary drainage conditions, and they would seek to confirm that stockpile design and management was adequate to prevent erosion and peat slide. These inspections would take place weekly during stockpile creation and storage.

Should any problems be observed during regular visual inspections of peat stockpiles, this would invoke implementation of an appropriate corrective action which would be recorded and monitored for effectiveness. Types of corrective actions would include, but would not necessarily be limited to; modification of temporary drainage, additional or modified bunding, incorporating of sediment fencing if required, light re-grading to correct any areas of surface erosion, etc.

Regular, frequent inspections of peat conditions during construction and restoration phases of work would be carried out by the Engineer and ECoW as follows:

- peat surface, peat profile and peat consistency conditions would be carried out as part of ground investigations prior to the start of construction. This information would provide detailed information on the baseline conditions for each part of the infrastructure footprint;
- restored peat conditions would be inspected immediately after restoration to ensure that the methods detailed in the PMP had been correctly implemented and to inform any corrective actions should they be required;
- further monitoring to be undertaken where required, to ensure restoration works have been correctly implemented; and
- the physical condition of peat would be retained as carefully as possible, both at the peat storage and the peat restoration stages. This is particularly important for vegetation establishment.



5.0 Peat Balance Assessment

Table C, below, provides an estimate of peat and peaty soil volumes to be excavated and re-used during the construction of the Proposed Development. The peat and peaty soil excavation and re-use volumes are detailed for each infrastructure element in **Annex A**.

5.1 Excavated Volumes

Peat excavation volumes associated with the construction of the Proposed Development have been calculated using the results from the peat depth surveys and interpolation using the GIS package ArcGIS. Peat excavation volumes are summarised in Table C and detailed in **Annex A** and based on the following assumptions:

- Interpolation of peat depth was undertaken using the Spline interpolation method.
- An estimated acrotelm depth of 0.5 m across all infrastructure based on peat depth survey results.
- The acrotelm volumes have been calculated based on the average peat depth across each item of infrastructure and linear infrastructure based on peat depth survey results.
- An assumption that the peat probe depths are representative of the actual depth of peat and validated by site observations.
- The excavated volumes will comprise primarily acrotelmic peat and soils.

5.2 Reuse Volumes

The volume of peat to be reused around the Proposed Development is detailed below in Table C and **Annex A** and is based on the following assumptions:

- Peat will be reused in appropriate locations around the infrastructure perimeter, such as track verges and the edges of permanent structures, a 2 m wide strip either side of the track at a thickness of about 0.8 m (turves and acrotelmic peat).
- Peat will be reused for the reinstatement of pole working area excavations, with reinstatement of peat and soils appropriate locations. This will include the re-use of peat around the perimeter of pole working area excavations, with a 1 m wide strip and with an average peat depth of 0.5 m, to ensure integration with adjacent habitats which may comprise blanket bog.

5.3 Net Peat Balance

Table C, below, provides an estimate of peat volumes to be excavated and reused during the construction of the infrastructure.

Table C: Peat Balance Assessment

Infrastructure	Volume of Peat Excavated (m ³)	Volume of Peat Reused and Reinstated (m ³)
Proposed Permanent Track	5,937	8,286
Proposed Temporary New Stone Track	0	0
Proposed Temporary Trackway Panel	0	0
Existing Forest Track to be Upgraded	3,951	3,951
Proposed ATV Route	0	0
Pole Excavation Areas	43,782	43,782



Infrastructure	Volume of Peat Excavated (m ³)	Volume of Peat Reused and Reinstated (m ³)
Total	53,670	56,019

The total volume of peat predicted to be excavated of **53,670** m³, does not exceed the intended total peat reuse volume of **56,019** m³, therefore no excess peat is required to be disposed off-site as a consequence of the Proposed Development.



6.0 Waste Classification

This section of the Stage 1 Outline PMP includes the method for dealing with peat which could potentially be classified as waste (only if the above volumes estimate significant quantities of catotelm peat, which cannot be re-used).

Table D, below, outlines where those materials that are likely to be generated on-site fall within the Waste Management Licensing (Scotland) Regulations 2011.

Based on the results presented in this document, it was concluded that all of the materials to be excavated on-site would fall within the non-waste classification and would be re-used on-site. Based on a detailed probing exercise and visual inspection of the peat, it is predominantly fibrous peat which would be suitable to be re-used on-site. Typically, the peat was found to be fibrous and fairly dry within the top metre before becoming slightly more pseudo-fibrous with depth.



Table D: Excavated Materials – Assessment of Suitability

Excavated Material	Indicative Volume % of total excavated soils	Is there a suitable use for material	Is the Material required for use on Site	Material Classified as Waste	Re-use Potential	Re-use on Site
Turf and Acrotelmic Peat	85	Yes	Yes	Not classified as waste	Yes	Will be re-used in reinstatement of pole excavation areas and track verges.
Catotelmic peat	15	Yes	Yes	Not classified as waste	Yes	Will be re-used in reinstatement of pole excavation areas and track verges.
Amorphous Catotelm Peat (amorphous material unable to stand unsupported when stockpiled >1 m)	0	Potentially	Potentially*	Potentially if not required as justifiable restoration of habitat management works	Limited	If peat does not require treatment prior to re-use it can be used on-site providing adequate justification and method statements are provided and approved by SEPA. If it is unsuitable for use without treatment then it may be regarded as a waste. However every attempt to avoid this type of peat has been incorporated into the design.

*Such uses for this type of material are limited, however there may be justification for use in the base of peat restoration areas to maintain waterlogged conditions and prevent desiccation of restored area and in some habitat management works such as gully or ditch blocking, where saturated peat is required to mimic mire type habitats and encourage establishment of sphagnum.



7.0 Conclusion

This Stage 1 Outline PMP presents a pre-construction assessment of the expected peat extraction and reuse volumes associated with the construction of the Proposed Development.

Through a process of continued design refinement (focused on minimising peat excavation volumes) and adoption of best practice working methods, the Proposed Development is expected to achieve an overall peat balance, i.e. the volume (and character) of excavated peat compliments requirements for re-use and reinstatement. Thus, all excavated material will be required for reuse as part of the works and no surplus peat is anticipated.

The Proposed Development supports moderately decomposed peat with a very distinct plant structure that is considered suitable for re-use during reinstatement work, e.g. dressing of infrastructure edges, restoration and borrow pit restoration. Good practice standards, which will be outlined in the updated CEMP, relating to excavation, handling and storage of peat, shall ensure against any compromise to the structural integrity of the peat and its associated suitability for reuse.

Avoidance of localised pockets of deep peat that would otherwise require excavation, will continue to be a key design refinement objective. Furthermore, it is expected that such micro-siting onto land supporting shallower peat deposits shall be possible during the construction of the Proposed Development.





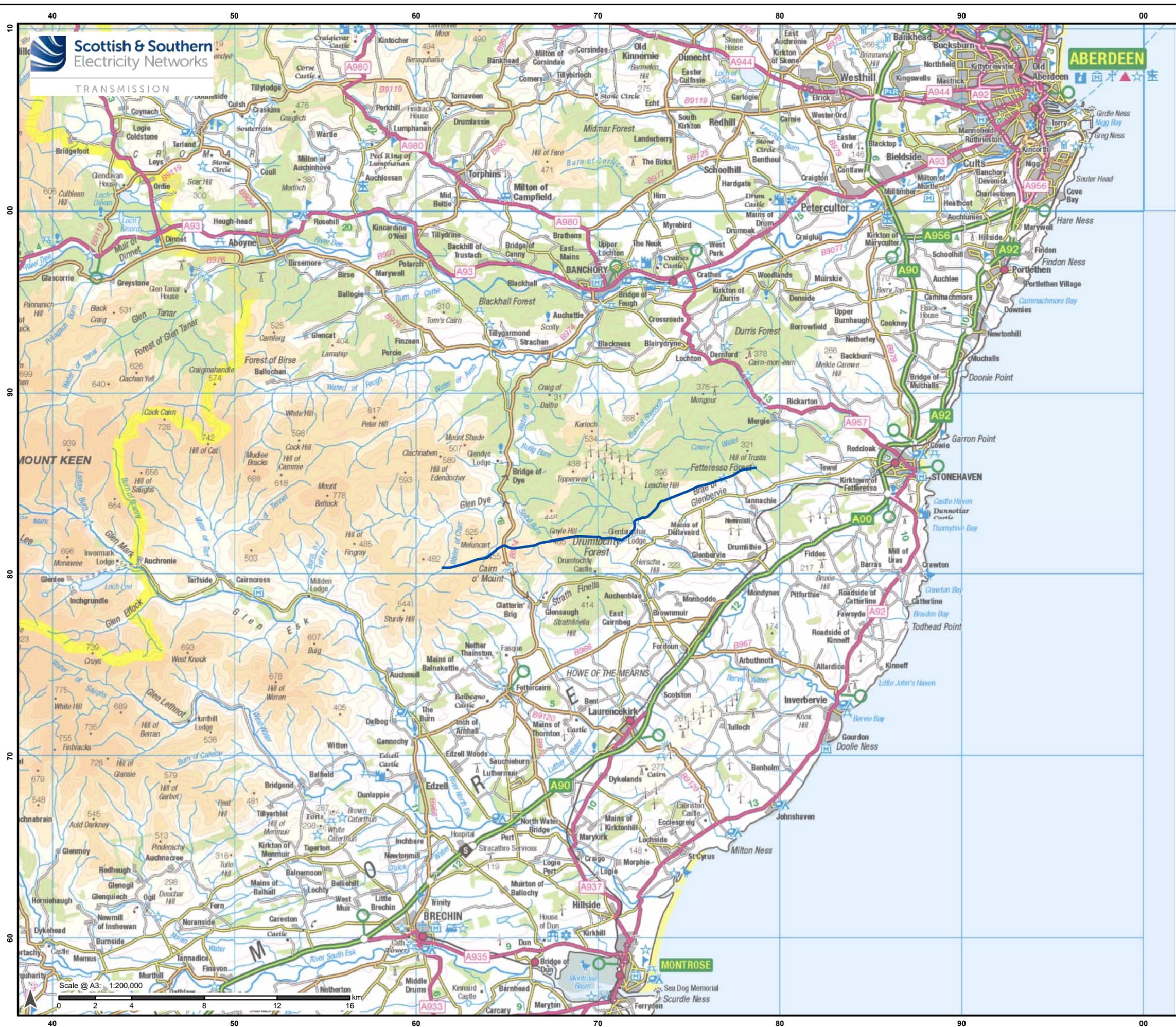
Figures

Technical Appendix 9.2: Peat Management Plan

Glendye Wind Farm Overhead Line Grid Connection

Scottish & Southern Electricity Networks (SSEN) Transmission

SLR Project No.: 428.013097.00001



Legend
 Proposed Overhead Line (OHL) Alignment

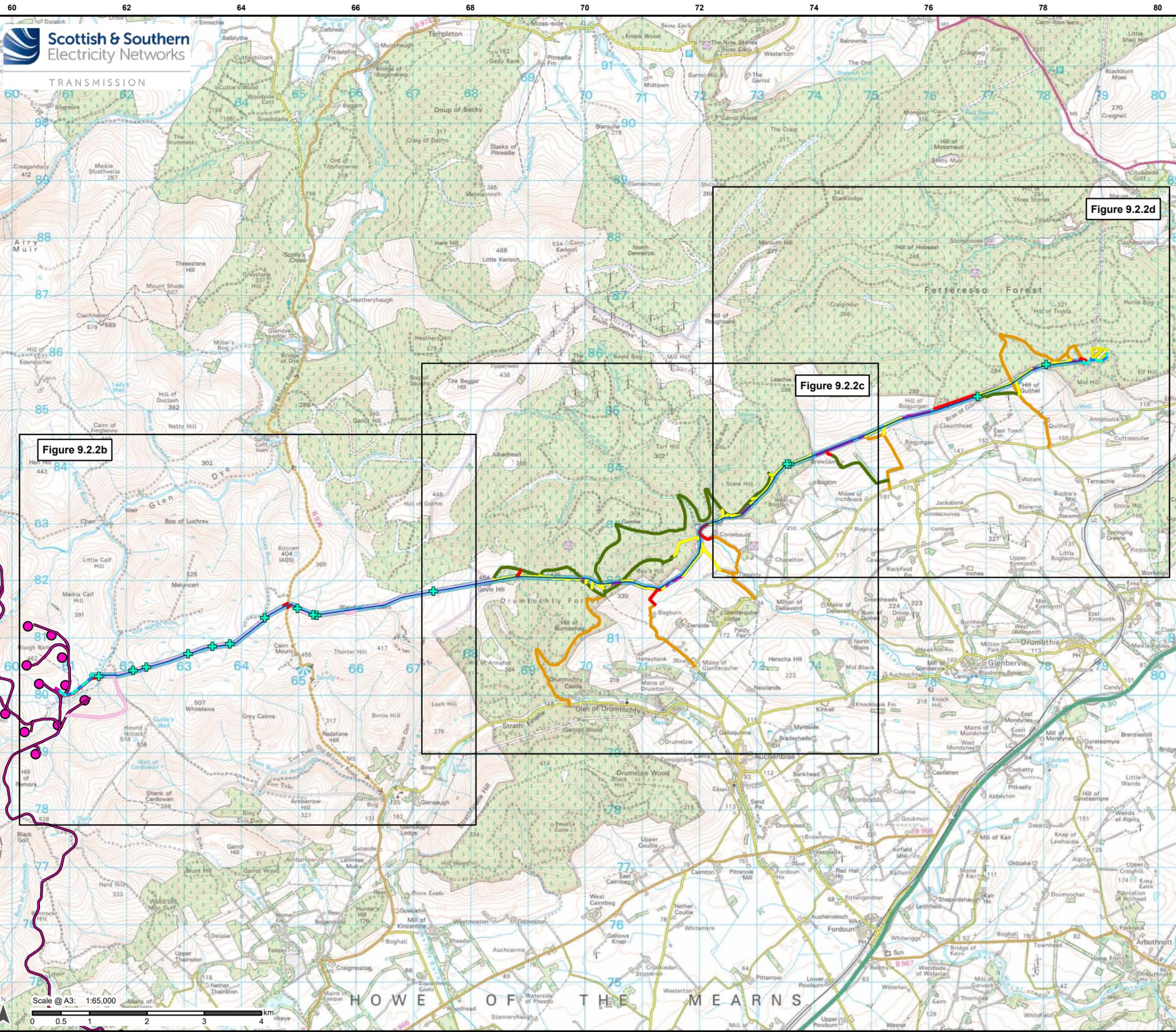
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Project No: LT468/469
 Project: Glendye Wind Farm Overhead Line
 Grid Connection

Title: EIA Report
 Appendix 9.2: Peat Management Plan
 Site Location
 Figure 9.2.1

Drawn by: QF
 Date: 08/10/2025

Scale @ A3: 1:200,000



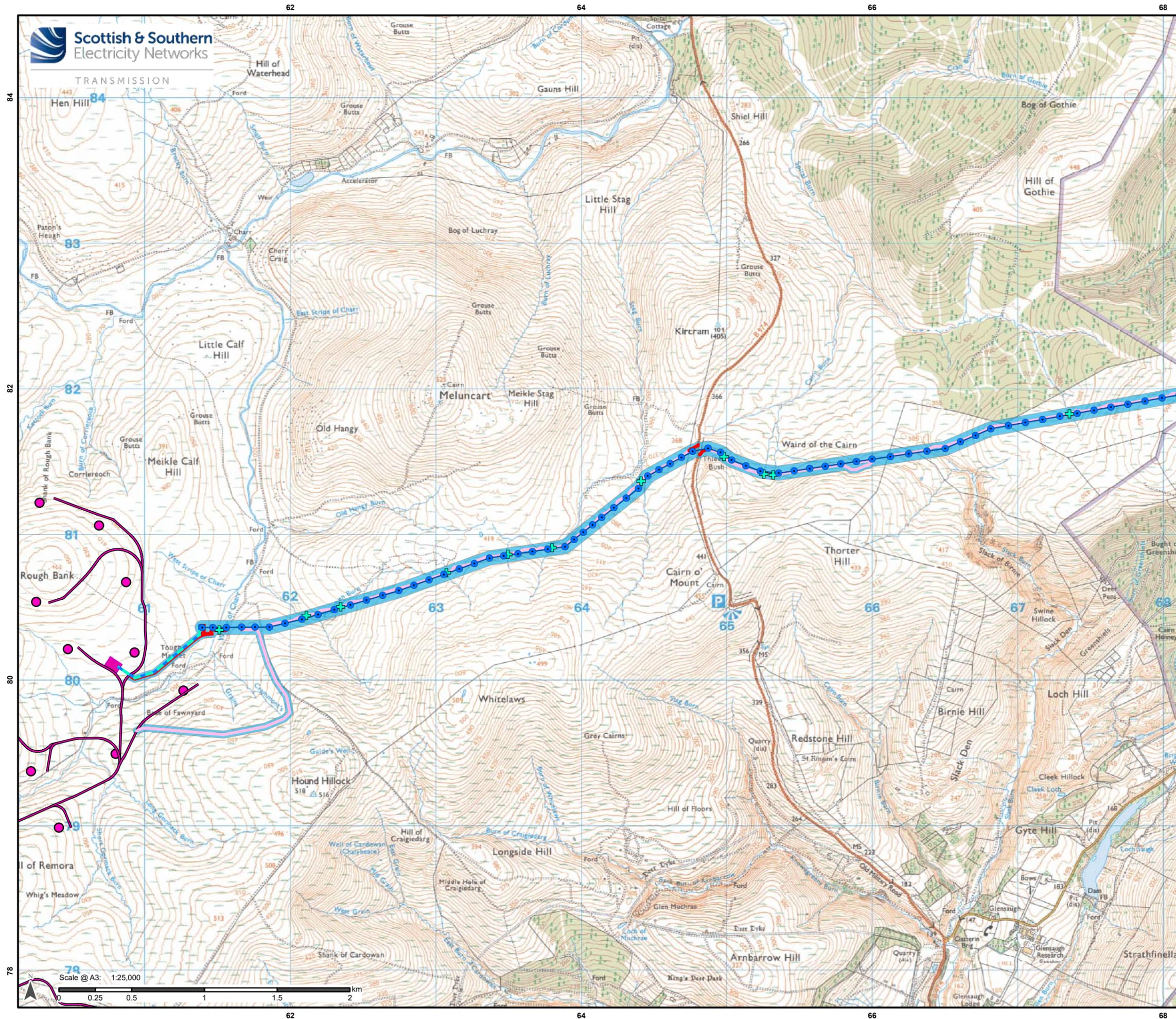
- ### Legend
- S.37 Overhead Line (OHL) Works**
 - Proposed OHL Alignment
 - Ancillary Development**
 - Proposed Permanent Track
 - Proposed Temporary Trackway Panel
 - Proposed Temporary New Stone Track
 - Existing Track
 - Existing Track to be Upgraded
 - Proposed ATV Route
 - Proposed Permanent Bridge or Culvert
 - Limit of Deviation**
 - Proposed OHL and Access Track Limit of Deviation (LoD)
 - Permitted Development**
 - Indicative 132 kV Underground Cable Alignment
 - Existing and Consented Development**
 - Existing Fetteresso Substation
 - Glendye 132 kV Substation
 - Glendye Wind Farm Access
 - Glendye Wind Farm Turbine

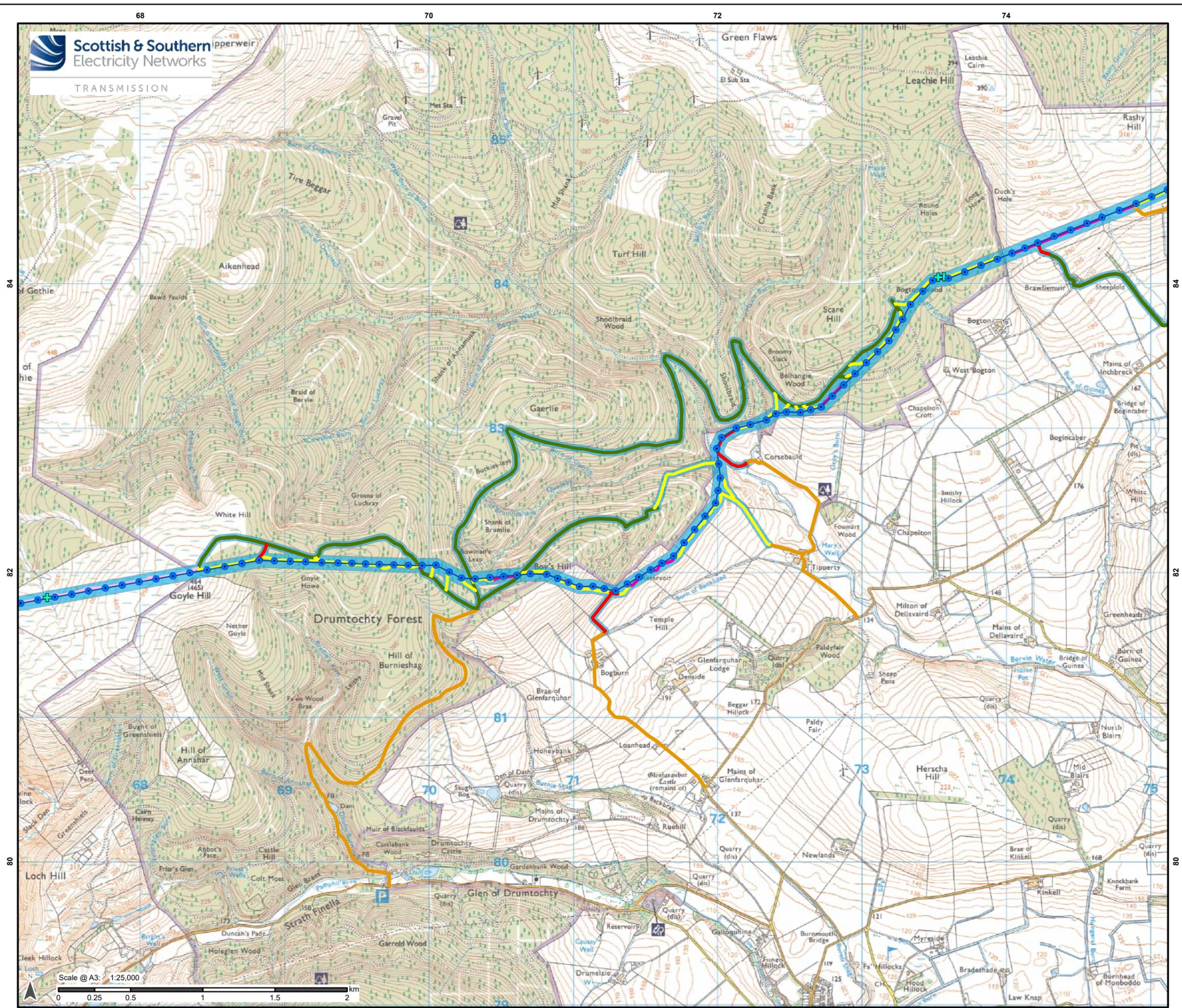
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Project: Glendye Wind Farm Overhead Line Grid Connection

Title: EIA Report
Appendix 9.1: Peat Management Plan Site Layout
Figure 9.2.2a

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Legend

S.37 Overhead Line (OHL) Works

- Proposed OHL Pole Location
- Proposed OHL Alignment

Ancillary Development

- Proposed Permanent Track
- Proposed Temporary Trackway Panel
- Proposed Temporary New Stone Track
- Existing Track
- Existing Track to be Upgraded
- Proposed ATV Route
- + Proposed Permanent Bridge or Culvert

Limit of Deviation

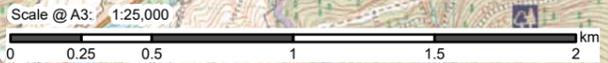
- Proposed OHL and Access Track Limit of Deviation (LoD)

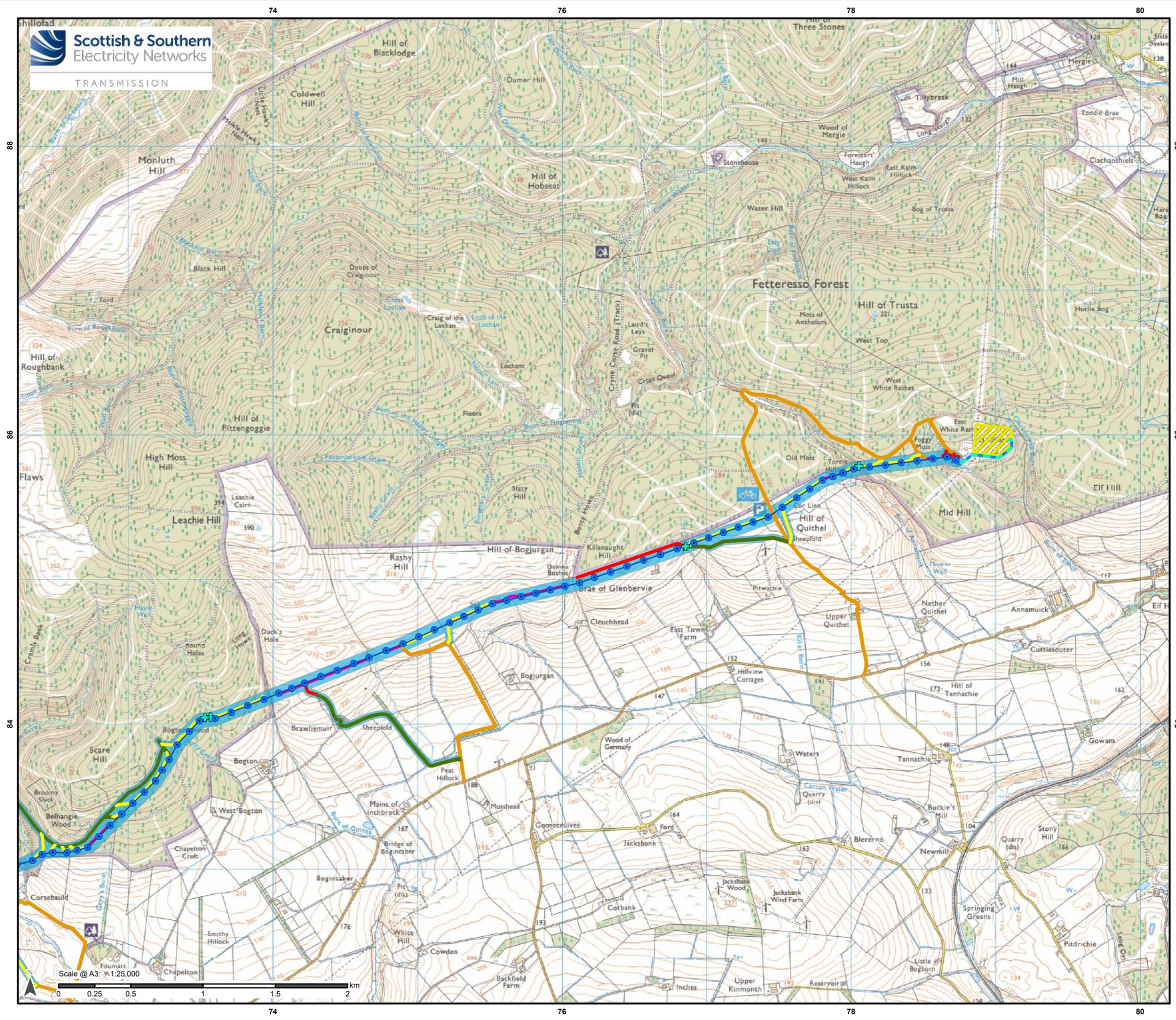
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Appendix 9.1: Peat Management Plan Site Layout
Figure 9.2.2c

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Legend

S.37 Overhead Line (OHL) Works

- Proposed OHL Pole Location
- Proposed OHL Alignment

Ancillary Development

- Proposed Permanent Track
- Proposed Temporary Trackway Panel
- Existing Track
- Existing Track to be Upgraded
- Proposed ATV Route
- Proposed CSE Hardstanding Area
- Proposed Permanent Bridge or Culvert

Limit of Deviation

- Proposed OHL and Access Track Limit of Deviation (LoD)

Permitted Development

- Indicative 132 kV Underground Cable Alignment

Existing Development

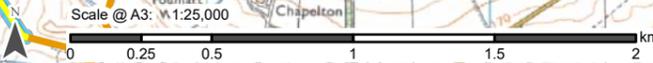
- Existing Fetteresso Substation

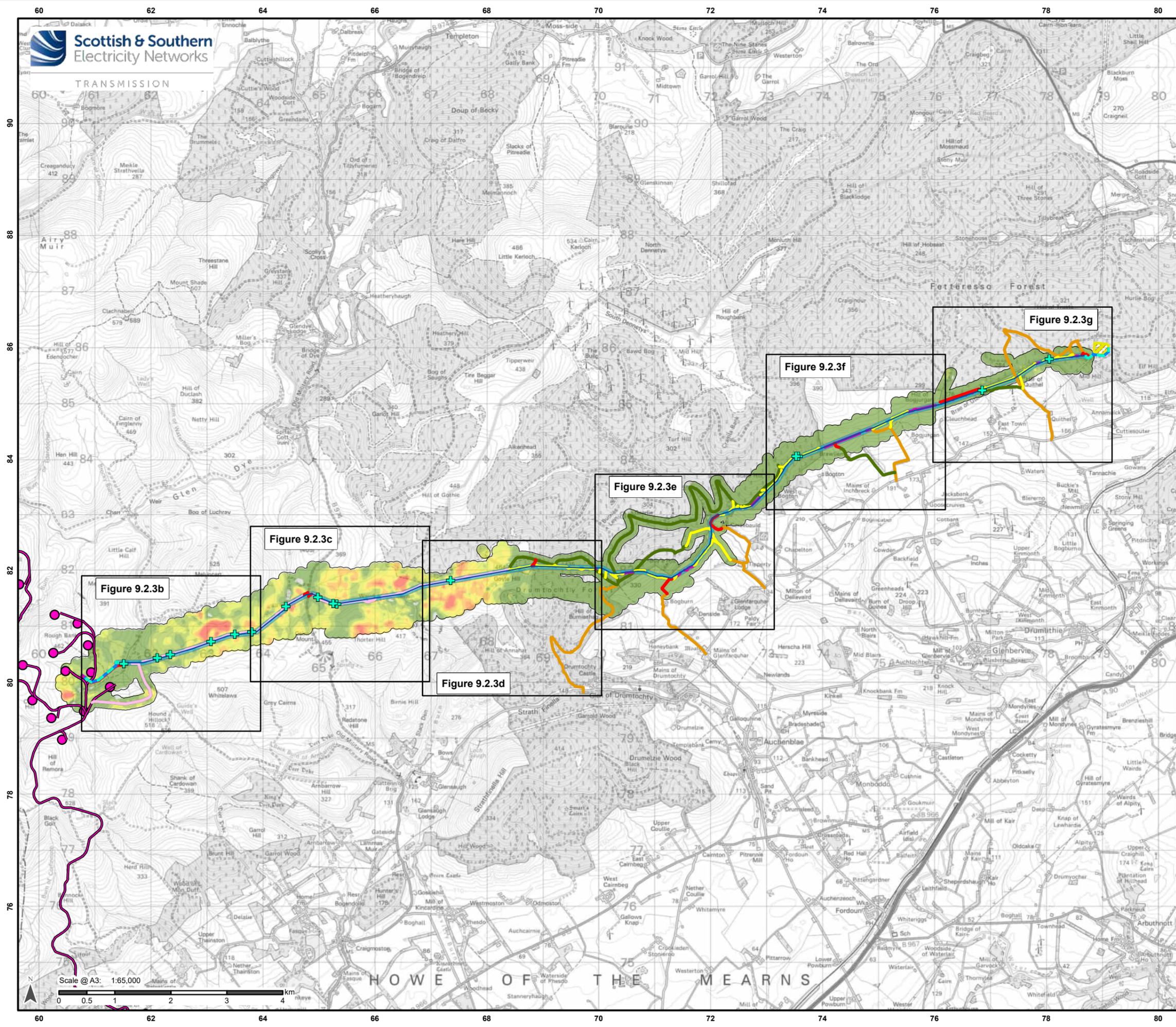
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Appendix 9.1: Peat Management Plan Site Layout
Figure 9.2.2d

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Legend

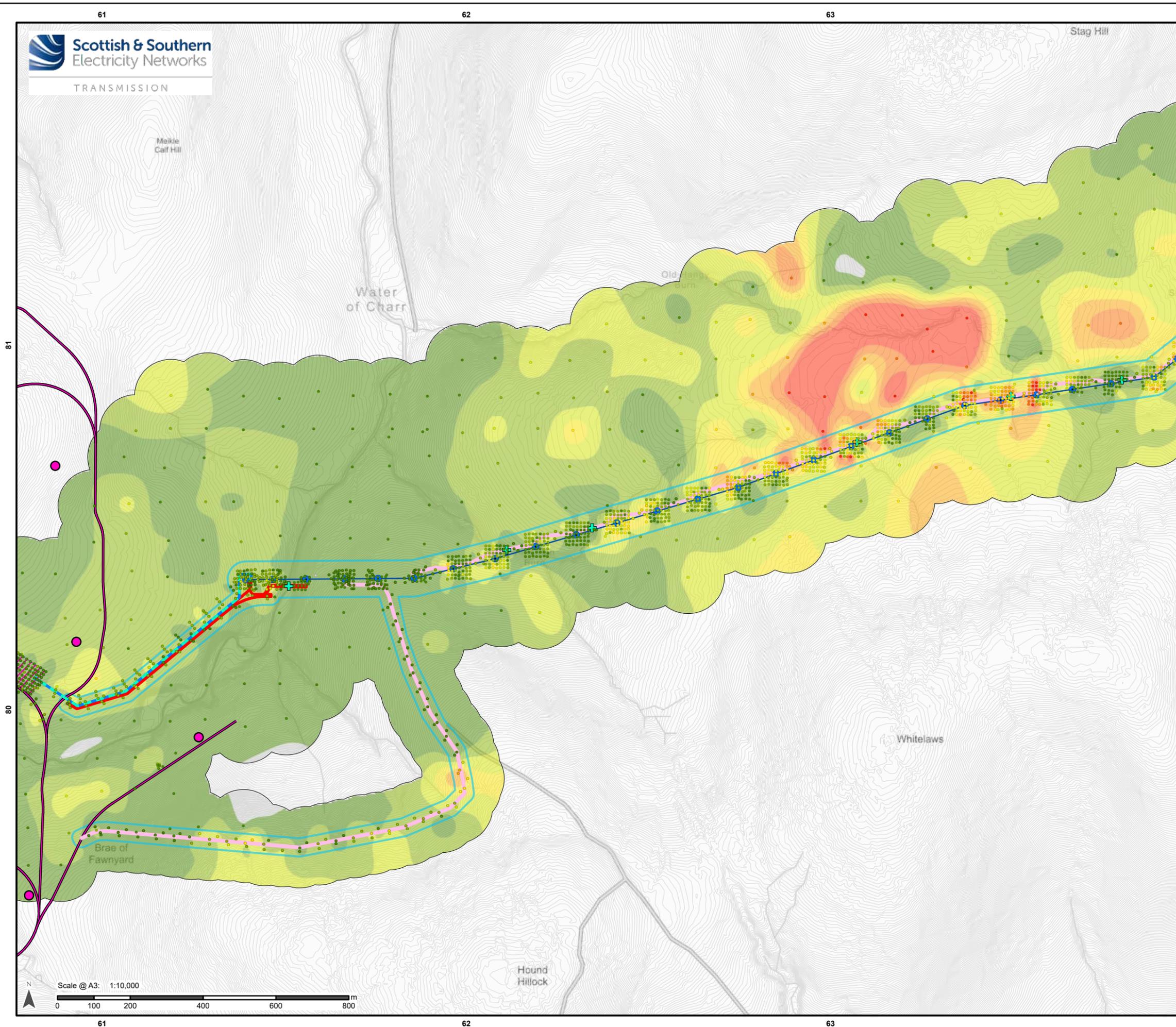
- S.37 Overhead Line (OHL) Works**
- Proposed OHL Alignment
- Ancillary Development**
- Proposed Permanent Track
 - Proposed Temporary Trackway Panel
 - Proposed Temporary New Stone Track
 - Existing Track
 - Existing Track to be Upgraded
 - Proposed ATV Route
 - Proposed Permanent Bridge or Culvert
- Limit of Deviation**
- Proposed OHL and Access Track Limit of Deviation (LoD)
- Permitted Development**
- Indicative 132 kV Underground Cable Alignment
- Existing and Consented Development**
- Existing Fetteresso Substation
 - Glendye 132 kV Substation
 - Glendye Wind Farm Access
 - Glendye Wind Farm Turbine
- Peat Depth (m)**
- 0
 - 0 - 0.5
 - 0.5 - 1
 - 1 - 1.5
 - 1.5 - 2
 - 2 - 2.5
 - 2.5 - 3
 - > 3

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Title: EIA Report
Appendix 9.2: Peat Management Plan
Peat Depth Detailed
Figure 9.2.3a

Drawn by: QF Date: 08/10/2025



Legend

S.37 Overhead Line (OHL) Works

- Proposed OHL Pole Location
- Proposed OHL Alignment

Ancillary Development

- Proposed Permanent Track
- Proposed Temporary New Stone Track
- Proposed CSE Hardstanding Area
- Proposed Permanent Bridge or Culvert

Limit of Deviation

- Proposed OHL and Access Track Limit of Deviation (LoD)

Permitted Development

- Indicative 132 kV Underground Cable Alignment

Consented Development

- Glendye 132 kV Substation
- Glendye Wind Farm Access
- Glendye Wind Farm Turbine

Peat Probe Depth (m)

- 0
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- > 3

Peat Depth (m)

- 0
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- > 3

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Title: EIA Report
 Appendix 9.2: Peat Management Plan
 Peat Depth Detailed
 Figure 9.2.3b

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