# APPENDIX 8-1 SOIL AND PEAT MANAGEMENT PLAN

# 1. SOIL AND PEAT MANAGEMENT PLAN

## 1.1 Introduction

### The Proposed Development

1.1.1 WSP was commissioned by Scottish and Southern Electricity Networks Transmission (SSEN Transmission), hereafter referred to as 'the Applicant', in 2022 to produce a Soil and Peat Management Plan (SPMP) to support the proposed construction and operation of a new 70 m 132 kilovolts (kV) overhead transmission line (OHL) and approximately 900 m of underground cable (UGC) (the 'Proposed Development').

1.1.2 The Proposed Development is located between the proposed Corriegarth 2 Windfarm Substation and a Connection Point on the existing 132kV transmission line between Corriegarth Windfarm Substation and the wider transmission network, see **Figure 1-1**.

1.1.3 The assessment is based upon the land within the Proposed Development and professional judgement and experience of assessing similar developments in similar environments. The following terms are used across this Report.

- Site – the Proposed Development.
- Study Area – includes the Site and extends 250 m beyond the Proposed Development, which enables consideration of features outwith the Site, such as watercourses or assets.

1.1.4 The proposed OHL would include three low profile trident H poles, which would approximately span for 70 m. The OHL would be composed of one cable sealing end structure, one intermediate suspension structure, and a tie in pole terminal structure. The pole configuration, height and the distance between poles will therefore only be fully determined after a detailed alignment survey and design. The Proposed Development will also include approximately 900 m of UGC.

1.1.5 Approximately 110 m of new access track will be required to facilitate installation and operation of the OHL and will be included in the s37 application. All other tracks would be removed upon completion of the Proposed Development with land being reinstated to as close as possible to its former condition.

1.1.6 The Site's current land use is heathland and moorland or rough hill pasture. Peat (regarded to be peat where depth is greater than 0.5 m) is recorded throughout the Site.

1.1.7 The foundations for each low-profile trident H pole will typically be installed via the use of a tracked excavator to excavate a trench approximately 2 m wide, 4 m in length, and 2.5 m deep, into which the poles will be installed before the excavated material is reinstated. Where suitable turves are available, they will be stripped and stored separately from sub-soils to be reused in final reinstatement.

1.1.8 During peat probing surveys undertaken by EnergyLine on the 2nd November 2021, it was established that peat was present within the Site. As a result, this work was commissioned to establish peat characteristics, depths and extent.

1.1.9 In its regulatory position statement Developments on Peat[1], the Scottish Environment Protection Agency (SEPA) state that *"developments on peat should seek to minimise peat excavation and*

[1] Scottish Environment Protection Agency (2010a). Regulatory Position Statement – Developments on Peat. [online] Available at: https://www.sepa.org.uk/media/143822/peat_position_statement.pdf [Accessed in March 2022].

*disturbance to prevent the unnecessary production of waste soils and peat"*. On the basis that peat excavation to some extent will be likely, this SPMP examines the volume of soil and peat likely to be excavated during the construction process, and the potential for minimising excavation and identifying volumes for re-use. It is recognised that while re-use of any peat and soil during the construction process represents the preferred option, any such use should be carefully considered regarding risks to the environment or human health.

## 1.2 Scope of Work

1.2.1 During the construction phase of the Proposed Development there will be a need to excavate soil (which may include peat) for infrastructure such as poles and underground cable. Where there is not a defined use for this material during the construction process, excess material will be considered as waste and will need to be disposed of in accordance with regulatory requirements.

1.2.2 This SPMP defines the likely excavation volume based on the Proposed Development's layout and dimensions and underlying peat conditions and evaluates options to minimise/re-use excavated volumes. Whilst there may be minor amendments to the Proposed Development's layout (through micro siting of infrastructure by a maximum of 25 m (s37 proposal) and 15 m (UGC proposal) from their current positions), this strategy ensures that appropriate plans for excavation, storage, re-use, and (if necessary) disposal of soil and peat have been considered in advance of the construction phase. The findings of this SPMP will be used by the appointed Principal Contractor as a basis for preparing the detailed construction SPMP, as part of an Construction Environmental Management Plan (CEMP) during construction.

1.2.3 This SPMP has followed the criteria laid out in the following guidance documents: Promoting the sustainable re-use of greenfield soils in construction (NatureScot (formerly known as Scottish Natural Heritage (SNH)))[2]; Regulatory Position Statement – Developments on Peat**Error! Bookmark not defined.**; and Developments on Peatland Guidance – Waste[3].

## 1.3 Methodology

1.3.1 Soil mapping[4] indicates the Site is predominantly underlain by rankers, peaty podzols, with subalpine soils present to the south.

1.3.2 Based on NatureScot mapping[5], Classes 4 and 0 cover the majority of Study Area. Classes 4 and 0 are not classified as priority peatland habitat. Class 2 '*nationally important carbon-rich soils, deep peat and priority peatland habitat*' covers 22.6 % of the Study Area. Two small areas of Class 1 '*nationally important carbon-rich soils, deep peat and priority peatland habitat*' are noted to the east and west of the Site, which cover 6.4 % of the Study Area. A peat depth survey was undertaken (as shown on **Figures 1-2 and 1-3** which supersedes the higher-level characterisation from NatureScot Carbon and Peatland Map dataset[5] see.

---

[2] SNH (NatureScot) and Forestry Civil Engineering (2010). Floating Roads on Peat. [online] Available at: http://www.roadex.org/wp-content/uploads/2014/01/FCE-SNH-Floating-Roads-on-Peat-report.pdf [Accessed in March 2022].

[3] Scottish Environment Protection Agency (2010b). Development on Peatland Guidance – Waste. [online] Available at: http://www.sepa.org.uk/media/144152/development_on_peatland_guidance_final_august_2010.pdf or via http://www.sepa.org.uk/environment/energy/renewable/ [Accessed in March 2022].

[4] James Hutton Institute (1982). Soil and Land Capability for Agriculture Maps and Handbook. [online]. Available at: https://www.hutton.ac.uk/learning/natural-resource-datasets/soilshutton/soils-maps-scotland [Accessed in March 2022].

[5] NatureScot (2016). Carbon and Peatland Map. NatureScot. [online] Available at: https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/soils/carbon-and-peatland-2016-map [Accessed in March 2022].

1.3.3 Excavated soil and peat management during the construction process falls into four main categories as follows:

- Excavation – at the location of all Site infrastructure, including trident H poles, underground cable, new tracks and tracks to be upgraded;
- Re-use – including re-use as part of the engineering fill around the trident H poles, underground cable trenches, new tracks and tracks to be upgraded, plus reinstating, backfilling and landscaping adjacent to the excavations. There may be options for further re-use of excavated material onsite;
- Storage – limited to the short-term storage of excavated material before re-use; and
- Disposal – where there is an excess of excavated material following reasonable opportunities for re-use in line with good practice, there may be a need for disposal of that material to a licensed waste facility.

## 1.4 Results

### Peat Depth Surveys

1.4.1 The Soil Survey of Scotland[4] and Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments[6], both indicate a minimum depth for soil to be defined as peat of 0.5 m. This threshold has been used to distinguish between peat and other soils throughout this report.

1.4.2 Peat depth surveys were undertaken in 2nd November 2021 focussing on the proposed pole locations.

1.4.3 The collected data from the surveys are summarised in **Table 1**. Of the 76 records within the Site, the average peat depth was 0.51 m. 40.8% of the points probed had a peat depth result of less than 0.50 m (i.e. less than threshold depth to be classified as peat), with 88.2% of the results less than 1.00 m and 100.0% less than 1.50 m. The peat depth results are mapped and presented as **Figure 1-3** of the Environmental Appraisal (EA).

**Table 1: Results of the Peat Probing Surveys within the Site**

| Peat/Soil Depth Range (m) | Number of locations surveyed | Percentage of locations surveyed | Average depth in range (m) |
|---|---|---|---|
| 0.00 to <0.50 | 31 | 40.8% | 0.23 |
| ≥0.50 to <1.00 | 36 | 47.4% | 0.62 |
| ≥1.00 to <1.50 | 9 | 11.8% | 1.01 |
| ≥1.50 to <2.00 | 0 | 0.0% | N/A |
| ≥2.00 to <2.50 | 0 | 0.0% | N/A |
| ≥2.50 to <4.00 | 0 | 0.0% | N/A |
| ≥4.00 | 0 | 0.0% | N/A |
| **Total / Aggregate** | **76** | **100.0%** | **0.51** |

[6] Scottish Government (2017). Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Second Edition). [online] Available at: http://www.gov.scot/Publications/2017/04/8868 [Accessed in February 2022].

## Estimates for Excavation and Re-use of All Material

*Excavation*

1.4.4 Excavation dimensions are based on the design information within **Chapter 2: Proposed Development** of the EA and shown on **Figure 1-1 Location Plan**.

1.4.5 The dimensions for the three trident H poles trenches, including a new cable sealing end wood pole, are approximately 2 m wide, 4 m in length, and 2.5 m deep. The excavated material equates to approximately 80 $m^3$ of excavated material (assumption is four trenches require to be created, two of which are to accommodate the cable sealing end structure). Based on the average peat depth within 25 m of the poles (0.25 m), the material is expected to be non-peat soils.

1.4.6 In areas of soft ground and / or very deep peat where firm ground cannot be found, foundations for H-pole structures with two windstays may be added to the foundations to maximise stability of the structure by supporting the structure with wider foundations. It is recognised that this will be a supplementary measure and will involve additional shallow excavations, depending on ground investigation results.

1.4.7 The dimensions for the underground cable are 2 m wide, 900 m in length, and 2 m deep. The total excavated material volume estimate is 3,600 $m^3$. Based on average peat depth within 30 m of the proposed UGC, 0.51 m, 900 $m^3$ will be peat. A construction corridor surrounding the trench is assumed to be up to 30 m wide. This will require a temporary access track and temporary excavated material storage The proposed underground cable trench dimensions are subject to change at detailed design stage.

1.4.8 The new permanent access track is assumed to be 110 m long and 5 m wide to allow for bidirectional transit of any vehicle types. This technique requires excavation of surface deposits and backfilling with aggregate to produce a final track level at, or close to, the existing surface level. The average peat depth within 25 m of the new access track is 0.30 m.Given the topography, the expected excavation depth is 0.80 m. This results in a total estimated excavated material volume of 440 $m^3$, of which 275 $m^3$ will be non-peat soils and 165 $m^3$ peat.

1.4.9 A temporary access track and compound will be required to facilitate the construction works alongside the UGC. The final position of the construction compound infrastructure items will be determined by the Principal Contractor following detailed design and further ground investigation. The temporary access track and compound will be removed and reinstated as part of the construction reinstatement works and have therefore not been considered as part of the assessment.

1.4.10 Subject to gradients and ground conditions, preference will be given to lower impact access solutions including the use of low pressure tracked personnel vehicles and temporary floating track solutions in boggy / soft ground areas to reduce any damage to, and compaction of the ground. These journeys would be kept to a minimum to minimise disruption to habitats along the Proposed Development.

**Table 2: Estimated earthwork volumes**

| Infrastructure | Number | Width | Length | Depth | Peat | Non-peat soils |
|---|---|---|---|---|---|---|
| Trident H Poles | 3 | 2 m | 4 m | 2.50 m | 0 $m^3$ | 80 $m^3$ |
| Trident H Poles<br>New Permanent Access Track | 1 | 5 m | 110 m | 0.80 m | 165 $m^3$ | 275 $m^3$ |
| Underground Cable | 1 | 2 m | 900 m | 2.00 m | 900 $m^3$ | 2,700 $m^3$ |

| Infrastructure | Number | Width | Length | Depth | Peat | Non-peat soils |
|---|---|---|---|---|---|---|
| | **Total** | | | | **1,065 $m^3$** | **3,055 $m^3$** |

*Re-use*

1.4.11 All excavated material (including peat and non-peat soils) from the installation of the trident H poles (80 $m^3$), and underground cable (3,600 $m^3$) will be re-used for reinstatement surrounding the poles and within and surrounding the underground cable trench.

1.4.12 It is anticipated that the volume of material excavated for the new permanent access track can be entirely reused for a variety of purposes, including infilling depressions and levelling-out gradients as part of the cut and fill track construction process, plus potentially to create low peaty soil banks (0.50 m maximum height). As a result, based on a 5 m wide new permanent access track, the balance between excavation and re-use will be zero.

1.4.13 There is also potential for excavated peat to be used for habitat restoration on or locally to the Site. Soil mapping suggests that the majority of the Site is underlain by rankers, peaty podzols. This potential re-use option has not been quantified but will provide an additional method to retain and beneficially re-use material.

*Storage*

1.4.14 It is expected that prior to construction commencing, in accordance with the CEMP, the contractor will provide a plan detailing potential locations for temporary storage and an outline programme indicating the duration and quantity of stored peat and measures to mitigate and/or capture sediment runoff from stored material. At all times the primary objectives will be to minimise both the time and volume of temporary storage and to prevent sedimentation of any watercourse or waterbody. Where practical, excavated peat will immediately be used locally for reinstatement and/or landscaping.

1.4.15 Good practice methods include careful removal of vegetated turves, short timescales between lifting and replacement of turves (with a 6-week reinstatement objective) and ensuring stored turves are kept in good condition (including watering when weather conditions could lead to desiccation). Revegetation of bare soil with native vegetation will be undertaken as soon as practicable. Excavated material will be re-used as close to excavation location as practicable and as soon as possible.

1.4.16 The contractor will follow standard good practice with regards to soil/peat storage[7] as stated in the CEMP. This will include temporary storage of materials at a minimum distance of 10 m from any watercourses and 50 m from any watercourse identified on Ordnance Survey 50,000 scale mapping, with soil mounds and restoration depths no higher than 2 m and with stable banking.

1.4.17 Elements of the management and re-use of excavated material will require approval from statutory stakeholders, including SEPA, taking account of reducing erosion/compaction, protecting the soils from pollution and retaining/enhancing soil functionality as a resource.

1.4.18 This report does not include long term material storage, e.g. for decommissioning purposes, as none is proposed or required.

[7] CIRIA (2006). Control of water pollution from linear construction projects: technical guidance. Publication C648; Construction Industry Research and Information Association, London.

## 1.5 Summary and Conclusions

1.5.1 A number of areas of excavation, reinstatement and re-use around infrastructure that could be carried out during construction are listed below. It is recognised that there is a degree of professional judgement involved in quantifying assumptions.

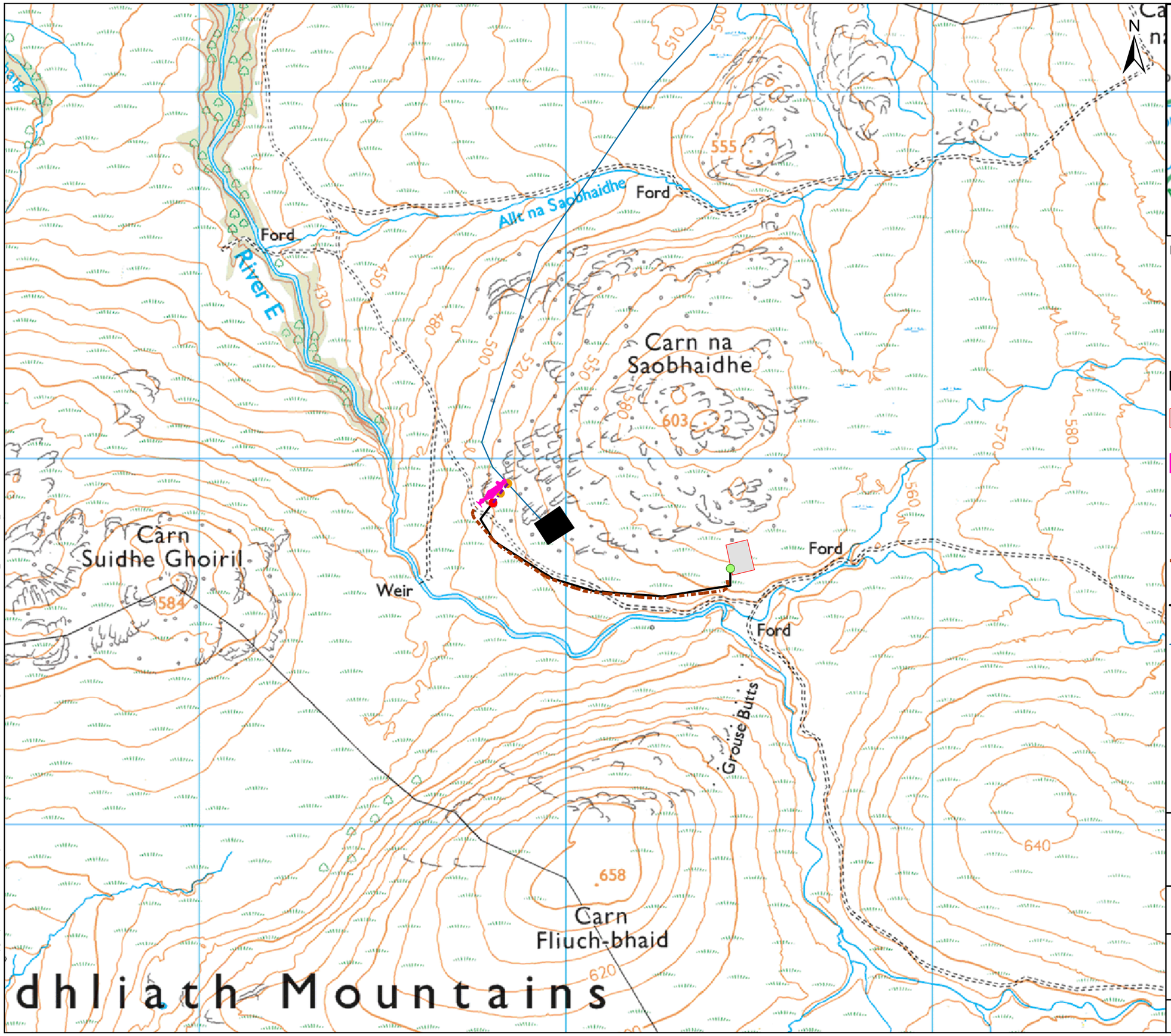
1.5.2 There are a number of opportunities to reduce the extent of excavation and/or increase the extent of re-use opportunities as good practice measures. These include:

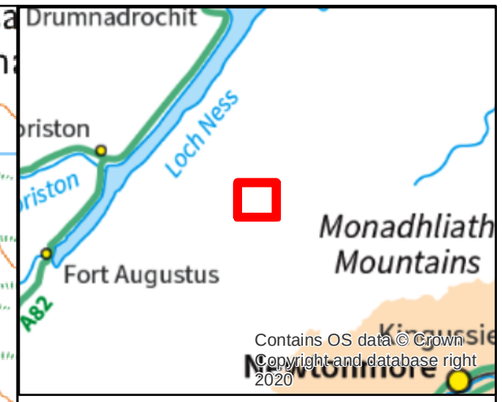
- reducing excavation depth required for Site infrastructure;
- avoiding excavation of the new access track by using less intrusive methods to achieve a sufficient degree of levelling;
- re-use of all excavated material for engineering fill and landscaping; and
- appropriate re-use of excavated material for reinstatement and profiling of the track verges on disturbed ground.

1.5.3 Applying the reasonable assumptions discussed above, it is expected there will be sufficient re-use opportunities to balance excavation values.

1.5.4 It is considered that all excavated material could be re-used (i.e. balance) with no material needing to be brought onto Site for restoration. All excavated material will be re-used nearby and in as short a timeframe as is feasible during the construction phase.

In the event that there is an excess of excavated material, application of additional options at the detailed design and construction phases will be required, as outlined above, in order to avoid off-Site disposal. Furthermore, if no Site use is available, off-Site re-use options should be explored, with appropriate disposal as waste considered only as the final option, in line with the “waste hierarchy”[3] and discussion with SEPA.




**Key**

- CORRIEGARTH 2 WINDFARM CONNECTION POINT
- NEW CABLE SEALING END WOOD POLE
- NEW TRIDENT WOOD POLE
- EXISTING CORRIEGARTH WINDFARM SUBSTATION
- PROPOSED CORRIEGARTH 2 WINDFARM SUBSTATION
- PERMANENT OVERHEAD LINE ACCESS TRACK (INCLUDING EARTHWORKS)
- PROPOSED 132kV CONNECTION OVERHEAD LINE
- PROPOSED TEMPORARY ACCESS TRACK
- PROPOSED 132KV CONNECTION UNDERGROUND CABLE
- EXISTING OVERHEAD LINE

0 0.25 0.5 km

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: Corriegarth 2 Windfarm Grid Connection

Title: Figure 1-1 Location Plan

Date: 19 July 2022 Scale: 10,000 @ A3

Drawn: MAL Checked: DT Approved: JB

Date Saved: 19/07/2022

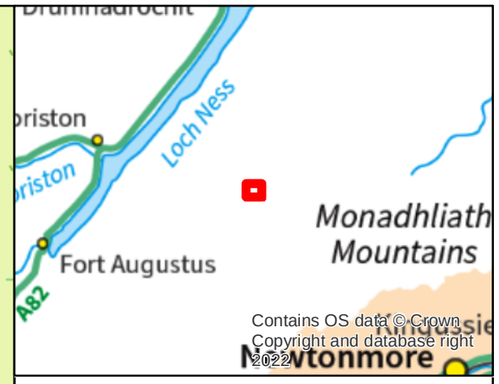
Carn na Saobhaidhe
603m

Weir

River E

567m

Grouse Butts




**Key**

- PEAT-PROBING LOCATION
- CORRIEGARTH 2 WINDFARM CONNECTION POINT
- EXISTING WOOD POLE
- NEW CABLE SEALING END WOOD POLE
- NEW TRIDENT WOOD POLE
- EXISTING CORRIEGARTH WINDFARM SUBSTATION
- PROPOSED CORRIEGARTH 2 WINDFARM SUBSTATION
- PERMANENT EARTHWORKS FOR ACCESS TRACK
- PERMANENT OVERHEAD LINE ACCESS TRACK
- PROPOSED DEVELOPMENT 250M BUFFER
- PROPOSED 132KV CONNECTION OVERHEAD LINE
- PROPOSED TEMPORARY ACCESS TRACK
- PROPOSED 132KV CONNECTION UNDERGROUND CABLE
- EXISTING OVERHEAD LINE

NATURESCOT CARBON AND PEATLAND MAP - IMPORTANCE

- CLASS 1
- CLASS 2

NATIONAL SOIL MAP OF SCOTLAND: GENERALISED SOIL TYPE

- RANKERS, PEATY PODZOLS; SOME HUMUS-IRON PODZOLS AND PEATY GLEYS
- SUBALPINE SOILS; SOME PEAT, RANKERS AND ALPINE SOILS

0 50 100 150 200 250 Metres

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: Corriegarth 2 Windfarm Grid Connection

Title: Figure 1-2 Soil and Peat Constraints

Date: 19 July 2022 Scale: 4,000 @ A3

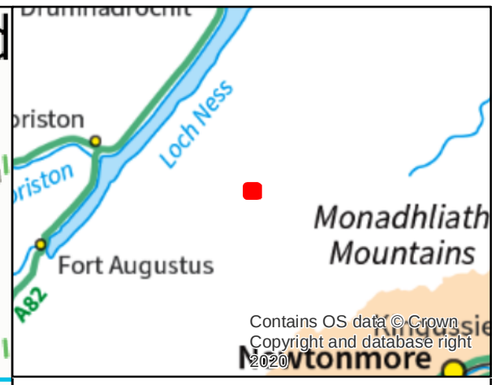
Drawn: MAL Checked: DT Approved: JB

Document Path: \\uk.wspgroup.com\Central Data\Projects\70090xx\70090409 - LT000300 Corriegarth Extension\03 WIP\GIS\MXD\8-2_SoilPeatConstraints_220719.mxd

Carn na Saobhaid

603m

River E




**Key**

PEAT DEPTH (M)

- 0.0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- CORRIEGARTH 2 WINDFARM CONNECTION POINT
- EXISTING WOOD POLE
- NEW CABLE SEALING END WOOD POLE
- NEW TRIDENT WOOD POLE
- EXISTING CORRIEGARTH WINDFARM SUBSTATION
- PROPOSED CORRIEGARTH 2 WINDFARM SUBSTATION
- PERMANENT OVERHEAD LINE ACCESS TRACK
- PERMANENT EARTHWORKS FOR ACCESS TRACK
- PROPOSED 132KV CONNECTION OVERHEAD LINE
- PROPOSED TEMPORARY ACCESS TRACK
- PROPOSED 132KV CONNECTION UNDERGROUND CABLE
- EXISTING OVERHEAD LINE

0 50 100 150 Metres

Client: Scottish & Southern Electricity Networks TRANSMISSION

Project: Corriegarth 2 Windfarm Grid Connection

Title: Figure 1-3 Peat Depth

Date: 19 July 2022 Scale: 2,500 @ A3

Drawn: MAL Checked: DT Approved: JB

Date Saved: 19/07/2022

Document Path: \\uk.wspgroup.com\Central Data\Projects\70090xx\70090409 - LT000300 Corriegarth Extension\03 WIP\GIS\MXD\8-3_Peat Depth Constraints_220719.mxd