Scottish & Southern Electricity Networks

TRANSMISSION

Hurlie 400kV Substation Environmental Impact Assessment - Appendix 12.3

Hurlie Substation Phase 1 Peat Survey Report

November 2024

CONTENTS

LIST OF ABBREVIATIONS

DTM- Digital Terrain Model
ha - hectares
kV- Kilovolt
LUC- Land Use Consultants
NPF4- National Planning Framework 4

1. INTRODUCTION

1.1 The Proposals

1.1.1 This appendix presents information relevant to the proposed Hurlie 400 kV substation development (Proposed Development). It should be read in conjunction with **Chapter 12: Hydrology, Hydrogeology, Geology And Soils** and **Chapter 3: Description of the Proposed Development** (**Volume 2**). The Proposed Development is located entirely within the Site (**Figure 1.1** in **Chapter 1: Introduction** in **Volume 2**).

1.1.2 This appendix is supported by the following figures:

- Figure 12.4: Carbon and Peatland (Volume 3 of this EIA Report); and
- Figure 12.5: Peat Probe Depths and Core Sample Locations (Volume 3 of this EIA Report).

1.2 Purpose and Scope of Report

1.2.1 Kaya Consulting Limited was commissioned by SSEN Transmission, via Land Use Consultants (LUC), to undertake a peat depth and coring survey for the proposed Hurlie substation development Site at Fetteresso, west of Stonehaven in the Aberdeenshire Council area. The purpose of the survey was to establish an understanding of the peat depths and spatial coverage within the Site to aid in the design process.

1.2.2 The Site covers an area of approximately ~250 hectares (ha) and comprises young, mature and felled forestry

1.2.3 The terrain across the Site is relatively consistent with gentle slopes, forming a low altitude plateau to the immediate east of Hill of Trusta.

1.2.4 The survey comprised surveying a 100 m grid across the area proposed for infrastructure within the Site boundary, along with coring at ~5% of probe locations. (**Figure 12.5**).

1.2.5 **Photos 1** and **2** present an overview of the existing site conditions.

Photo 1: Site Overview 1

Photo 2: Site Overview 2

2. METHODOLOGY

2.1 Desk-Based Initial Assessment

2.1.1 The Carbon and Peatland Map 2016 (Scottish Natural Heritage (now NatureScot), 2016) was consulted prior to the survey. The map contains information on the likely peatland classes present within the survey area. The Carbon and Peatland map was developed to be used as "a high-level planning tool to promote consistency and clarity in the preparation of spatial frameworks by planning authorities".

2.1.2 Within the Carbon and Peatland map, Class 1 and Class 2 peatlands are identified as areas of "nationally important carbon-rich soils, deep peat and priority peatland habitat". Class 1 peatlands are also "likely to be of high conservation value" and Class 2 "of potentially high conservation value and restoration potential".

2.1.3 The Carbon and Peatland classes within the Site are shown in **Figure 12.4** and indicates that the majority of the Proposed Development area is comprised of Class 4 with a small area of Mineral Soil (Class 0) in the north and a small area of Class 5 peat in the east. The relevant Class descriptions are below:

- Class 4 – Area unlikely to be associated with peatland habitat or wet and acidic type. Area unlikely to include carbon-rich soils. Indicative vegetation is heath with some peatland.
- Class 5 – 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. Peat soil, with no peatland vegetation.

2.1.4 The results of the desk-based assessment indicate that peat is likely to be present within the Site.

2.2 Survey Methodology

2.2.1 The survey methodology follows current guidance in Scotland (Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only).

2.2.2 The field survey was undertaken by a team of two with the appropriate experience of assessing hydrology, hydrogeology, geology, soil, and peat for infrastructure in upland environments.

2.3 Survey Dates and Conditions

2.3.1 The survey was undertaken on the 31 August 2023 and 1 September 2023. Weather conditions during the survey were dry, sunny weather with little wind. The Site is covered in extremely dense forestry, with several areas of windblown trees and very difficult ground conditions.

2.4 Phase 1 Probe Survey

2.4.1 The following methods were employed:

- The Site was sampled using a 100m systematic grid. The survey points were aligned to best fit the Ordnance Survey National Grid reference grid. The grid was generated using QGIS software.
- A total of 269 sampling points were surveyed and the depths at each probe location are presented in **Figure 12.5: Peat Probe Depths and Core Location**.
- The peat survey was carried out using an extendable fibreglass utility probe capable of sampling to 5m.
- 12 cores were taken at representative locations around the Site (~5% of probes) to characterize the soil profile and determine if the soils are peat.
- Where a small area of deeper peat was recorded during coring (at core location 2) additional spot probes (not on the 100m grid) were taken to delineate and assess the area and depth of peat.

3. RESULTS

3.1 Probe Depths

A summary of the probe depth data is presented in **Table 1** and the histogram below it. The probe depth data is presented spatially in **Figure 12.5**.

3.1.1 The Scottish Government guidance document on peat landslide hazard and risk assessment (Scottish Government, 2017) defines peat as a soil greater than 0.5m in depth, with an organic matter content of more than 60%. Soils of less than 0.5m depth are classified as organo-mineral soils, with soils less than 0.25m not classified as peat. This is further evidenced by JNCC (2011), SNH (Bruneau, et al, 2014) and the James Hutton Institute (2019).

3.1.2 In summary:

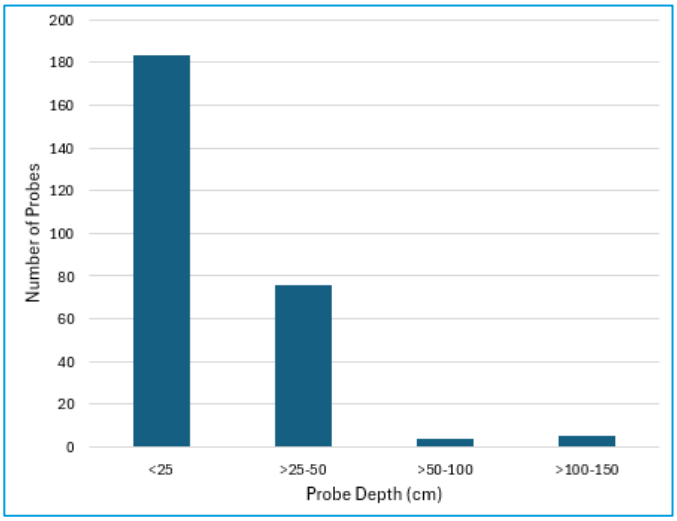
- 68.4% of probes were recorded as having a depth of less than or equal to 25cm. These probes are not classified as peat.
- 28.2% of probes were recorded as having a peat depth of between >25-50cm. These probes are classified as organo-mineral soils and not formally considered to be peat.
- 1.5% of probes were recorded as having a peat depth of between >50-100cm.
- 1.9% of the probes were recorded as having a peat depth of >100cm.

3.1.3 It should be noted that these probe depth distributions are not directly representative of the peat coverage over the Site, as additional probes were sampled to delineate the small area of peat found on the eastern edge of the Site.

3.1.4 Overall, the soil encountered is predominantly mineral soil, containing some peaty material. The soil is less than 50cm and is therefore not considered to be peat. A small, well defined, area of peat along the upper reaches of the Burn of Baulks was observed in the east of the Site (**Figure 12.5**).

Table 1: Probe Depth Summary

Probe Depth Range (cm)	Number of Probes	Percentage of Total Probes
<25cm	184	68.4%
>25-50	76	28.2%
>50-100	4	1.5%
>100-150	5	1.9%
Total	**269**	**100%**



3.2 Peat Cores

3.2.1 **Table 2: Collected Core Data** shows the information collected from the peat coring.

3.2.2 A consistent approach was taken to core sampling, with a core taken in the deepest part of suspected peat or peaty soil. Areas containing peat identified in the survey had been heavily modified by forestry plantation, and as a result the acrotelm and catotelm layers in the cores were often poorly defined. Generally, the cores indicated that there is very little peat across the Site. In the two cores (cores 2 and 3) where peat was suspected , the core indicated that the peat was heavily modified and of extremely poor quality, incohesive and oxidised.

3.2.3 The areas cored were all found to be underlain with stony clay or gravels with some area of bedrock.

3.2.4 Representative examples of the cores taken are shown in **Photo 3**.

Table 2: Collected Core Data

Core ID	Peat	Core Depth	Acrotelm Thickness (cm)	Catotelm Thickness (cm)	Von Post	Notes
1	No	15	0	0	NA	Organic Soil
2	Yes	110	10	100	H4-H5	Modified
3	Yes	100	10	90	H4-H5	Modified
4	No	30	0	0	NA	Organic Soil
5	No	15	0	0	NA	Organic Soil
6	No	10	0	0	NA	Organic Soil
7	No	10	0	0	NA	Dry Soil
8	No	10	0	0	NA	Organic Soil
9	No	5	0	0	NA	Peaty Soil
10	No	30	0	0	NA	Peaty Soil 30cm
11	No	15	0	0	NA	Organic Soil
12	No	15	0	0	NA	Dry Soil

3.2.5 **Table 2: Collected Core Data** demonstrates that the soils within the Site are mainly organo-mineral soils and the majority of the Site is not considered to comprise peat or carbon rich soils. There is a very small exception where peat is present.

3.2.6 The exception is a small area (0.92 ha) of peat in the east of the Site which extends some 230m x 40m, as shown in **Figure 12. 5**. This area is close to the upper reach of the Burn of Baulks and lies within area classed as Class 5 peat by the NatureScot (2016) Carbon and Peatland map. It is noted that the area of deeper peat does not correspond to the extent of Class 5 shown in the Carbon and Peatland map. The appearance, texture and Von Post assessment of the peat indicates that it is not likely to be of suitable quality or abundance for re-location or restoration.

3.2.7 The area of peat was considered during the early design of the Proposed Development and the substation platform and associated infrastructure has been located to avoid disturbing this area, ensuring no peat is impacted by the Proposed Development.

3.3 Peatland Condition

3.3.1 The Site is composed mainly of plantation forestry, of varying stages of maturity. The forestry has had a significant impact on the soil, due to several factors such as transpiration of the trees, artificial drainage and the physical disturbance of the soil. Therefore, the peatland condition within the Site has been designated a mixture of ‘Forestry/Previously Forested’ and ‘Modified’ due to human influences degrading any peat which may have once dominated the Site. **Photo 4** demonstrates the current land use and is representative of the condition of much of the Proposed Development.

Photo 3: Examples of cores taken during the survey

Photo 4: Forestry within the Site

4. SUMMARY

4.1.1 Kaya Consulting Limited was commissioned by SSEN Transmission, via LUC, to undertake a probe depth survey for the proposed Hurlie substation development at Fetteresso, west of Stonehaven in the Aberdeenshire Council area.

4.1.2 This report covers the methodology and output of all the peat survey undertaken at the Proposed Development area. The purpose of the survey was to establish an understanding of the soil depths and peat distribution at the Proposed Development. The findings of the survey will help optimise the design and layout to minimise both the extent of disruption to peatlands and the quantity of peat excavated.

4.1.3 A total of 269 probes were collected across the Phase 1 probe survey for the Proposed Development and the results summarised below:

- 68.4% of probes were recorded as having a depth of less than or equal to 25cm. These probes are not classified as peat;
- 28.2% of probes were recorded as having a peat depth of between >25-50cm. These probes are classified as organo-mineral soils and not formally considered to be peat;
- 1.5% of probes were recorded as having a peat depth of between >50-100cm; and
- 1.9% of the probes were recorded as having a peat depth of >100cm.

4.1.4 A total of 12 cores were taken across the survey area. Generally, the cores indicated that there is very little peat across the Proposed Development and the two cores (cores 2 and 3) where peat was present indicated that the peat was heavily modified and of extremely poor quality, incohesive and be oxidised.

4.1.5 Overall, from the combination of probe depth and core data, it is indicated that most of the Site is comprised of mineral soils, with peaty material. Although there is some peaty material within these soils, the soil does not appear to be carbon-rich and is shallow.

4.1.6 In the context of NPF4 and subsequent NatureScot (2023) guidance, it is considered that the majority of the Site is not peat, and the soils are not considered to be carbon rich soils, as would be expected given the indicative Class 4 classification by NatureScot (2016) mapping.

4.1.7 The exception is the small area of peat that was delineated in the east of the Site, which is peat. It is noted that this small area of peat has been avoided through the design of the Proposed Development.

5. REFERENCES

- Bruneau, P.M.C & Johnson, S.M. (2014). Scotland's peatland - definitions & information resources. Scottish Natural Heritage Commissioned Report No 701.
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