

Glenouther Wind Farm

EIA Report

Technical Appendix 9.2: Peat Survey Report

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1 Introduction

Kaya Consulting Ltd was commissioned by Wind Power North Four Ltd. (hereafter referred to as the Applicant) through LUC to undertake a peat depth survey for the proposed Glenouther Wind Farm (hereafter referred to as the Proposed Development).

The Proposed Development is located on Glenouther Moor, to the immediate south of Corsehouse reservoir, and approximately 4.5 km north-east of Stewarton (hereafter referred to as 'the Site'). The Site itself is wholly within East Ayrshire.

The Site is located on a large area of commercial forestry with some open areas of blanket bog habitat and measures an area of ~ 2 km². The topography across much of the area to the west and south is generally flat, owing to its position on the Glenouther Moor blanket bog. The terrain is incised by the Swinzie Burn and other small watercourses. The northern area of the Site sits higher at a maximum elevation of 236 m AOD (Above Ordnance Datum).

This report covers the methodology and output of the Phase 1 (preliminary, low-density survey) and the Phase 2 (detailed, high-density) peat surveys undertaken at the Site. The purpose of the surveys was to establish an understanding of the peat depths at the Site to optimise Site design and layout to minimise both the extent of disruption to peatlands and the quantity of peat excavated.

The Phase 1 survey comprised surveying a 100 m grid across the full area proposed for infrastructure within the Site boundary. The results of the Phase 1 survey helped inform the initial layout of the Proposed Development.

The Phase 2 survey used a 10 m grid to cover areas in detail where there will be infrastructure associated with the Proposed Development. This includes the footprint of the turbine locations, working areas (including hardstandings), construction compound and substation. A 20 m grid was used within a 40 m buffer of proposed infrastructure to aid with micro-siting considerations during the design process. Additional survey, at 25 m intervals with 10 m offsets, was undertaken on the proposed access tracks.

This document should be read in conjunction with Chapter 9: Hydrology, Hydrogeology, Geology and Peat and Technical Appendix 9.3: Outline Peat Management Plan of the EIA Report.

2 Methodology

2.1 Desk-based Initial Assessment

The Carbon and Peatland Map (NatureScot, 2016) was consulted prior to the peat 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”.

The Carbon and Peatland map for the Site is shown in **Figure 9.6: NatureScot Peatland Classification** (see Volume 3a: Figures of EIA Report) which shows that the Site is predominantly comprised of Class 5, with some smaller areas of Class 1 and Class 4. The relevant Class descriptions are below:

- Class 1 comprise nationally important carbon-rich soils, deep peat and priority peatland habitat. Class 1 areas are likely to be of high conservation value. None of the Proposed Infrastructure lies within a Class 1 area, with Class 1 being found only along the eastern Site boundary and the north-western corner of the Site.
- Class 4 areas are unlikely to be associated with peatland habitats or wet and acidic type. Class 4 areas are predominantly mineral soil with some peat soil. The only area of Class 4 within the Site lies on higher ground along the northern Site boundary, encompassing a small part of the northern section of the temporary hardstanding for Turbine 3.
- Class 5 comprises areas where soil information takes precedence over vegetation data. Typically, no peatland habitat is recorded. This Class is often used to designate areas where peat has been planted over with commercial forestry, as is the case with the Site. In this circumstance, the underlying peat deposits can be of significant depth despite the degraded quality of the habitat. Class 5 comprises the majority of the Site, with the vast majority of the Proposed Development lying within this area.

The British Geology Survey (BGS) superficial deposits mapping shows the Site to be nearly entirely dominated by quaternary peat deposits (see **Figure 9.4: Superficial and Bedrock Geology** in Volume 3a of the EIA Report). Peat soils within the Site are lacustrine and palustrine in origin. They comprise accumulated and detrital organic material, forming beds and lenses within lagoons, bogs and swamps. Small sections of the Site are comprised of glacial till and alluvial deposits along the bed of the Swinzie Burn, as well as a small area along the northern Site boundary.

The results of the desk-based assessment indicated that peat was likely to be present within the boundaries of the Site.

2.2 Phase 1 Survey Methodology

The survey methodology followed current guidance in Scotland (Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only). The Phase 1 peat survey was conducted by MacArthur Green (part of SLR) for the Applicant and provided to Kaya Consulting.

The following methods were employed for the Phase 1 peat survey:

- 378 peat probe depths were recorded across the Site on a 100 m by 100 m grid.

- The peat survey was carried out using an extendable fibreglass utility probe capable of sampling up to 10 m depth. The peat base is established when the probe can no longer be passed or encounters sufficient resistance.
- The peatland condition was retrospectively assigned to each point using satellite imagery and on-Site ground truthing at each probing location. The peatland condition categories were based on those used in the NatureScot (2016) Peatland Condition Survey guidance. The peatland condition categories were:
 - Actively eroding
 - Drained
 - Forested / previously forested
 - Modified
 - Near natural
 - Not peatland

2.3 Phase 2 Survey Methodology

The survey methodology followed the same guidance as noted above for the Phase 1 survey.

The Phase 2 survey used a 10 m grid to cover areas in detail where there will be infrastructure associated with the Proposed Development. This includes the footprint of the turbine locations and working areas (including hardstandings). A 20 m grid was used to support micro-siting considerations during the design process. Additional survey, at 25 m intervals with 10 m offsets was undertaken on the proposed access tracks.

The following methods were employed for the Phase 2 peat survey:

- 1,784 peat probe depths were recorded across the Site.
- The peat survey was carried out using an extendable fibreglass utility probe capable of sampling up to 5 m depth. The peat base is established when the probe can no longer be passed or encounters sufficient resistance.
- Peat cores were taken using a hand auger capable of sampling up to 1 m. Cores were taken at each proposed turbine location, construction compound and substation compound.
- 13 cores were taken during the survey, with Von Post Humification Scale and BS5930 soil description recorded for each soil horizon, where applicable.
- The peatland condition was assessed at each probing location. The peatland condition categories were based on those used in the NatureScot (2016) Peatland Condition Survey guidance. The peatland condition categories were:
 - Actively eroding
 - Drained
 - Forested / previously forested
 - Modified
 - Near natural
 - Not peatland

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

2.4 Survey Dates

The Phase 1 peat survey was undertaken during the period Thursday 12th of September to Thursday 19th of September 2024 (excluding the intervening weekend).

The Phase 2 peat survey was undertaken during the period Wednesday 27th of August to Friday 29th of August 2025. The weather during the survey was sunny and dry with some scattered showers throughout.

Additional Phase 2 peat survey was carried out on the 22nd of January 2026 to survey additional areas as part of an updated design iteration. The weather was showery and overcast. Antecedent rainfall conditions were very wet in the days prior to the Phase 2 survey.

3 Survey Results

3.1 Peat Depths

Table 1 show the results obtained across the Phase 1 and Phase 2 peat surveys. A total of 2,162 probes were collected across the two surveys.

Guidance from NatureScot (2023) defines carbon-rich soils as peat soils and peaty soils. Peat soils in Scotland are defined as soil with a surface peat layer with more than 60% organic matter and of at least 50 cm thickness. Peaty soils can have a shallower peat layer (<50 cm) at the surface (NatureScot, 2023).

The combined results of the Phase 1 and Phase 2 surveys are:

- 3.0% of probes were recorded as having a depth of less than or equal to 30 cm. These probes are not classified as peat.
- 6.2% of probes were recorded as having a depth of between 30 – 50 cm. These probes are classified as organo-mineral soils and not formally considered to be peat.
- 24.8% of probes were recorded as having a peat depth of between 50 – 100 cm.
- 65.9% of the probes were recorded as having a peat depth of over 100 cm.
- The deepest probe depth recorded on the Site was 820 cm.

Figure 9.7: Peat Depths in Volume 3a of the EIA Report shows the spatial distribution of the peat depths over the Site. The deepest peat was found in the north of the site during the Phase 1 survey and lies within the open, unforested areas at the centre of Glenouther Moor. The shallowest areas of peat lie at the south of the Site near the fluvial area of the Swinzie Burn.

Table 1: Peat depth summary

Peat depth range (cm)	Phase 1 Survey	Phase 2 Survey	Combined	Combined Percentage of total probes
>30	4	61	65	3.0
30 - 50	18	117	135	6.2
50 - 100	41	496	537	24.8
100 - 200	63	487	550	25.4
200 - 300	73	428	501	23.2
300 - 400	62	149	211	9.8
400 - 500	52	46	98	4.5
500 - 600	38	0	38	1.8
600 - 700	23	0	23	1.1
700 - 800	3	0	3	0.1
800 - 900	1	0	1	0.0
Total	378	1784	2162	100

3.2 Peat Cores

Figure 9.7: Peat Depths in Volume 3a of the EIA Report shows the distribution of the 13 soil cores taken across the Site as part of the peat survey. The cores were collected using a hand auger corer capable of sampling to depths of up to 1 m. Core samples were taken at turbine locations for multiple design iterations as well as at construction and substation compounds. Representative cores are shown in **Photos 1 - 3**.

Of the 13 cores collected, all were found to contain carbon-rich soils. Of these, 11 cores were found to have peat thickness of 50 cm or greater and are therefore classified as 'peat soils', as per the 2023 NatureScot guidance, while the remaining two are classed as 'peaty soils'. Of the 11 peat soil cores taken, two were too amorphous to core properly as they could not be cored past 50 cm due to the presence of highly amorphous peat past this depth.

Table 2 shows the peat depth and composition of the cores taken, while **Table 3** details the BS5930 and Von Post soil descriptions for each cored soil horizon, where applicable.

All of the peat soil cores taken consisted of catotelmic peat, with the water table sitting directly at or just below the ground surface level. The antecedent rainfall conditions were very wet in the run up to the Phase 2 surveys. The Site was noted to be very water-logged and wet during all surveys conducted. The majority of cores taken were of high fibrous content with little to no woody material.

Photo 2: IL7_T2



Photo 1: IL7_T4



Photo 3: IL5_T3



Table 2: Total peat depth and composition across the 13 cores

Core ID	Eastings	Northings	Peat Soil Present	Peaty Soil Present	Total Peat Depth - cm
IL5_CC	248635	648572	Yes	No	100
IL5_SS	248638	648570	Yes	No	85
IL5_T1	248746	648503	Yes	No	290*
IL5_T2	247644	648793	Yes	No	210*
IL5_T3	248028	648675	Yes	No	270*
IL5_T4	248030	648673	Yes	No	70
IL5_T5	248239	649121	Yes	No	100
IL7_T1	247630	648827	Yes	No	280*
IL7_H1	248289	648378	No	Yes	N/A
IL7_SS	247719	648335	No	Yes	N/A
IL7_T2	248549	648494	Yes	No	230*
IL7_T3	247603	648856	Yes	No	280*
IL7_T4	247980	648763	Yes	No	160*

**Peat depth derived from peat probe data where core depth was over 1 m*

Table 3: Soil descriptions for the 13 cores – Von Post scale and BS5930:1999

Core ID	Easting	Northing	Horizon 1 - cm	Horizon 2 - cm	Horizon 3 - cm	Horizon 4 - cm	Von Post	BS5930
IL5_CC	248635	648572	30	30	20	20	H3 – H6	Orange brown, firm, plastic PEAT with moderate root content
IL5_SS	248638	648570	35	50	-	-	H6 – H9	Dark brown, amorphous, malleable, plastic PEAT. Thin gravelly CLAY at base.
IL5_T1	248746	648503	290*	-	-	-	Peat too amorphous to core – H10	Very amorphous, highly humified, waterlogged brown PEAT
IL5_T2	247644	648793	30	50	130*	-	H7 – H10	Orange-brown, highly amorphous PEAT with some root content
IL5_T3	248028	648675	20	250*	-	-	H8	Brown, highly amorphous, waterlogged PEAT with high root content
IL5_T4	248030	648673	40	30	-	-	H1	Black-brown, very firm PEAT. Thin CLAY layer at base underlain by GRAVEL.
IL5_T5	248239	649121	60	40	-	-	H2	Horizon 1 - dark brown, sticky, plastic, stiff PEAT. Horizon 2 - light grey/brown, stiff, plastic peaty CLAY
IL7_T1	248289	648378	280*	-	-	-	Peat too amorphous to core – H10	Very amorphous, highly humified, waterlogged brown PEAT

Core ID	Easting	Northing	Horizon 1 - cm	Horizon 2 - cm	Horizon 3 - cm	Horizon 4 - cm	Von Post	BS5930
IL7_H1	247719	648335	20	30	-	-	H8	Horizon 1 - Amorphous, humified, saturated ORGANIC soil. H2 - +30cm fine, grey/light brown gravelly CLAY
IL7_SS	247630	648827	35	-	-	-	H1	Firm, plastic dark brown ORGANIC soil with root material. Stiff grey CLAY underlying
IL7_T2	248549	648494	230*	-	-	-	H10	Highly amorphous, humified, dark brown PEAT
IL7_T3	247603	648856	280*	-	-	-	H10	Highly humified, highly amorphous, saturated brown PEAT
IL7_T4	247980	648763	160*	-	-	-	H8	Highly amorphous, humified brown PEAT

**Peat depth derived from peat probe data where core depth was over 1 m*

3.3 Peatland Condition

Table 4 show the results of the peatland condition assessment obtained during the peat survey.

The majority of the Site is afforested by commercial conifer plantation – see **Photo 4**. Based on condition assessment at each probed location, 98% of the Site was classed as ‘Forested / Previously forested’. Unforested areas (comprising 1% of the probed locations classified as ‘Modified’) are restricted to the open section at the centre of Glenouther Moor and a few clearings located north of the Swinzie Burn - see **Photo 5**. Partitioned areas between forestry blocks are classified as forested, as these areas are narrow and encroachment of conifer saplings is common – see **Photo 6**.

The ‘Not Peatland’ class corresponds to a small section of the existing M74 service road, just east of the Site boundary and comprised roughly 1% of the locations surveyed. This was surveyed as part of an earlier iteration of the Site boundary and the data is included for completeness, however it is noted that the service road is now outside the final redline boundary of the Site.

Table 4: Phase 2 peatland condition assessment based on the peat survey

Peatland Condition	Number of probes	Percentage of total probes
Actively eroding	0	0
Drained: Artificial	0	0
Drained: Hagg / gully	0	0
Forested / previously forested	2116	98
Modified	21	1
Near natural	0	0
Not peatland	25	1
Total	2162	100.0

Photo 4: Afforested peaty area close to Turbine 1



Photo 5: Forest clearing with modified peatland



Photo 6: Forestry partition/firebreak with encroaching saplings



4 Summary

This report covers the methodology and output of the Phase 1 (preliminary, low-density survey), and the Phase 2 (detailed, high-density) peat surveys undertaken at the Site. The purpose of the surveys was to establish an understanding of the peat depths at the Site to optimise the design and layout of the Proposed Development, and thereby minimise both the extent of disruption to peatlands and the quantity of peat excavated. A total of 2,162 probes were taken across the Site.

The results of the peat survey are summarised below and are shown in **Figure 9.7** of Volume 3a of the EIA Report:

- 3.0% of probes were recorded as having a depth of less than or equal to 30 cm. These probes are not classified as peat.
- 6.2% of probes were recorded as having a depth of between 30 – 50 cm. These probes are classified as organo-mineral soils and not formally considered to be peat.
- 24.8% of probes were recorded as having a peat depth of between 50 – 100 cm.
- 65.9% of the probes were recorded as having a peat depth of over 100 cm.
- The deepest probe depth recorded on the Site was 820 cm.

The deepest peat was found in the north of the Site during the Phase 1 survey and lies within the open, unforested areas at the centre of Glenouther Moor. The shallowest areas of peat lie at the south of the site near the fluvial area of the Swinzie Burn.

Analysis of 13 peat cores taken across the Site confirmed that the majority of the Site is comprised of peat soils (defined as peat), with shallower peaty soils (defined as not peat) located close to the Swinzie Burn to the south of the Site.

The surveyed area was found to consist predominantly of commercial forestry, with 98% of assessed locations classed as 'Forested / Previously forested'. A marginal proportion of probed locations (~ 1%) were found to be 'Modified' peatland and were located within unforested clearing areas.

5 References

British Standards Institution (1999) BS5930:1999 Code of practice for Site investigations. Available online at <https://knowledge.bsigroup.com/products/code-of-practice-for-Site-investigations>

NatureScot (2023) Advising on peatland, carbon-rich soils and priority peatland habitats in development management, November 2023. Available online at <https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management>

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

Scottish Natural Heritage, [now NatureScot] (2016). Carbon and Peatland 2016 map. Available online at https://map.environment.gov.scot/Soil_maps/?layer=10

Scottish Natural Heritage, [now NatureScot] (2016). Peatland ACTION - Peatland Condition Assessment – Leaflet. Available online at <https://www.nature.scot/doc/peatland-action-how-do-i-assess-condition-my-peatland>