Environmental Impact Assessment Report

Teindland Wind Farm

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1. Introduction

Fairhurst were instructed by Envams, to carry out Phase 2 Peat Probing followed by an assessment of peat slide risk and the preparation of a peat management plan for Teindland Windfarm. The proposed development includes the construction of 12 wind turbines, a Battery Energy Storage System and a combination of new and re-aligned access tracks.

The site is situated within Moray, Northern Scotland centred on NJ 29229 54492, approximately 2km north of Rothes and 7km southeast of Elgin. The site currently comprises 1050Ha upland forested plantation managed by Forestry Land Scotland (FLS). The proposed development plan is presented within Appendix A.

This report provides the findings of this assessment and presents the peat management plan. It is understood that this report will be utilised in support of planning.

1.1 Objectives & Scope

The main objective of this Report is to confirm the extent and thickness of peat present across the site, to establish if there are significant peat slide risks requiring mitigation as well as outlining the peat management plan to be adopted during the construction of the wind farm. This Report will inform design and be utilised in support of Planning.

The results noted significant peat deposits to be localised within the site, whereby they have largely been pre-emptively mitigated through avoidance. On this basis, it has been established that a separate more detailed Peat Sliding Risk Assessment is not required. This report provides justification for this approach.

The assessment undertaken takes cognisance of Scottish Government Peat Landslide Hazard and Risk Assessment: Best Practice Guide for Proposed Electricity Generation Developments (April 2017), Scottish Environmental Protection Agency (SEPA) Guidance.

1.2 Peat Classification & Considerations in Peat Slide Risk

Peat is an organic soil comprising the decayed organic remains of wetland plants. It accumulates where the rate of deposition of dry vegetative matter exceeds its rate of decay, with physical, chemical, and biological processes associated with wetland conditions, which would allow the decaying matter to retain some of its plant structures for extended periods of time[1].

The Scottish Government[2] characterises the peat as follows:

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

In addition, peat classification is aided by its classification in accordance with the Von Post Humification Scale. This scale is a measurement of the degree of decomposition of dead plant matter, using

[1]A risk-based approach to peatland restoration and peat instability. Mills, A. J. and Rushton, D. 2023. NatureScot Research Report 1259.
[2] Peat Landslide Hazard and Risk Assessment: Best Practice Guide for Proposed Electricity Generation Developments. Second edition, 2017. Scottish Government.

parameters such as fibre integrity, colour and viscosity of the exudate, and the presence of colloidal particles. The scale ranges from 1 (10% or undecomposed) to 10 (100% decomposed / colloidal). Most shallow to moderate depths peats (1m to 2m) will typically have humification values of H7 to H8 at their base. This classification effects how the peat will behave and hence how it should be treated/managed within developments.

An important factor in assessing the instability risks associated with peat is the slope angle. The table below provides a summary of the Peat Landslide Hazard and Risk Assessment (PLHRA) document as prepared by the Scottish Government.

Table 1: Peat landslides types and key controlling parameters, taken from Peat Landslide Hazard and Risk Assessment: Best Practice Guide for Proposed Electricity Generation Developments (After Dykes and Warburton, 2007a).

Peat landslide type	Definition	Typical slope range	Typical peat thickness
Bog burst	Failure of a raised bog (i.e. bog peat) involving the break-out and evacuation of (semi-) liquid basal peat	2° – 5°	2m – 5m
Bog flow	Failure of a blanket bog involving the break-out and evacuation of semi-liquid highly humified basal peat from a clearly defined source area	2° – 5°	2m – 5m
Bog slide	Failure of a blanket bog involving sliding of intact peat on a shearing surface within the basal peat	5° – 8°	1m – 3m
Peat slide	Failure of a blanket bog involving sliding of intact peat on a shearing surface at the interface between the peat and the mineral substrate material or immediately adjacent to the underlying substrate	5° – 8° (inferred)	1m – 3m (inferred)
Peaty debris slide	Shallow translational failure of a hillslope with a mantle of blanket peat in which failure occurs by shearing wholly within the mineral substrate and at a depth below the interface with the base of the peat such that the peat is only a secondary influence on the failure	4.5° – 32°	<1.5m
Peat flow	Failure of any other type of peat deposit (fen, transitional mire, basin bog) by any mechanism, including flow failure in any type of peat caused by head-loading	Any of the above	Any of the above

1.3 Geographical, Geological, Hydrology Setting

General Setting & Topography

The site is situated within Teindland Woods which is an area of upland forestry plantation. The topography of the site is relatively gradual, with the elevation ranging between ~170m and ~250m AOD. The lowest point is situated to the north of the site, corresponding to the main access road into the site (access via B9103 towards the east of the site), situated at 95m AOD. Within the site, five named high points are noted on the Ordnance Survey 1:25,000 map, referred to as Hill of Orbliston (150m) situated towards the north of the site, Findlay's Seat (262m) situated within the centre of the site, Hunt Hill (261m)

situated towards the west of Findlay's Seat, Feith Wood (198m) towards the southeast of the site, and Teindhall Hill (253m), situated towards the southwest of the site.

The elevations of the proposed wind turbines can be summarised by Table 3 as provided below.

Table 2: Wind Turbines Elevation Level derived from Digital Elevation Model (DEM).

Wind Turbine	E	N	Elevation (approximate)	Closest high point (distance to peak)
1	328975.29	855376.79	188m	Hill of Orbliston (630m NE)
2	328542.81	854715.1	191m	Findlay's Seat (980m SW)
3	329214.39	853690.88	178m	Findlay's Seat (600m W)
4	329575.34	853251.81	178m	Feith Wood (570m E)
5	328597.93	853271.4	182m	Findlay's Seat (570m NW)
6	328301.88	853740.98	176m	Findlay's Seat (0m)
7	327650.47	853876.78	177m	Hunt Hill (200m NW)
8	327475.59	854326.63	184m	Hunt Hill (300m SE)
9	327961.71	853139.98	185m	Findlay's Seat (740m NE)
10	328775.35	852676.81	175m	Findlay's Seat (1200m NW)
11	328138.7	852710.72	180m	Teindhall Hill (890m SW)
12	328350.31	852176.78	164m	Teindhall Hill (580m SW)

Geology

Superficial Geology

According to the British Geological Survey (BGS) Online GeoIndex, the majority of the site is recorded to be underlain by Glacial Till of Devensian Age. The BGS also recorded three areas of peat to be situated within the overall proposed development boundary, recorded to be present below wind turbines 3 and 7, and within close proximity to turbines 1, 2 and 8. The substrate underlying the peat is therefore likely to comprise of Glacial Till (often stiff cohesive material but may also comprise granular material. No superficial geology was recorded in an area spanning north to south below turbines 6 and 9. Where no superficial geology was recorded, the substrate is likely to comprise bedrock.

Soil Composition

Soil maps provided by the Scottish Government outlined the majority of the Teindland Woods to be consisting of Mineral Podzols (humus-iron), with its parent material derived from Upper Old Red Sandstone sediments with limited areas of peat. The southern end of the site comprises Peaty Gleyed Podzols, derived from the same parent material as the Mineral Podzols, along with acid metamorphic rocks. Towards the northwest of the site, the soils are classified as Mineral Gleys, comprising of noncalcareous gleys with peaty gleys, composed of the same parent material. The eastern side of the site is classed as Brown Soil (moderately acidic).

Gleys are soils described to be periodically or permanently waterlogged and have a lack of oxygen within their pore spaces through which the grey colour arises within the soil. As such, Gleys are poorly drained material.

Podzols are described as acidic soils with a grey leached layer just below the surface and bright orangey-brown coloured subsoils and/or dark brown to black, organic rich subsoils. The Mineral Podzol

is described to be imperfectly drained, where the Peaty Gleyed Podzol is described as freely draining below the iron layer.

Solid Geology

According to the British Geological Survey (BGS) 1:25,000 series Sheet NJ25/35 (Fochabers), the northern part of the proposed area is underlain by the Spey Conglomerate formation with sporadic thin pebbly sandstone beds. The southern portion of the site is underlain by Psammite, part of the Grampian Group.

Hydrology

There are numerous small watercourses situated within the proposed development area in accordance with the Ordnance Survey 1:25,000 map. Towards the north, flowing down towards the south / southeast, there is Cushley Burn, a tributary to Carra Burn. Carra Burn has another two unnamed watercourses joining, flowing from the southern centre of the site towards the north, 230m towards the northwest of Henderson's Well (329744.2,854482.1). Towards the southeast of the site flowing towards the south, there is Feith Burn. The burn that issues from the centre of the site, flowing towards the south is referred to as Burn of Garbity. It has three additional unnamed watercourses that joins up to this burn. Towards the west of the site, the Whities Stripe burn is a tributary to Sauchenbush Burn, flowing from the north towards the south. A spring is also noted to be present adjacent to the Whities Stripe burn. An additional three unnamed water courses join up to the Sauchenbush Burn. Bordering the western site boundary, Gawrie Burn is situated, flowing in a north to southward direction. Other minor unmarked watercourses may be present across site.

A small loch, sizing 150m length x 50m width 250m is recorded towards the south of the access track centred at E329468.9, N855641.3.

Scottish Environment Protection Agency (SEPA)'s online available Flood Maps highlights that there are numerous localised pockets considered to have a high likelihood of surface water flooding. The aforementioned burns are demonstrated to be correlated with the high likelihood of surface water flooding, highlighting that the flooding is contained within the riparian zones of the onsite watercourses and within the forestry blocks, considered to likely be a consequence of commercial forestry operations.

2. Peat Probing

Phase 1 Peat probing was undertaken and reported by Locogen Consulting Ltd in August 2021. The Phase 1 Peat Probing was undertaken on an approximate 100m grid across the proposed red line boundary at the time of investigation and included 415No. probes undertaken with adoxin rods.

The Phase 1 data was utilised by Fairhurst to scope additional Phase 2 probing which was undertaken in November 2024. The Phase 2 Peat Probing included 182No. probes undertaken with a 10mmø metal rod. Russian corers were used with plastic casing to sample peat where encountered. The Phase 2 Peat Probing was scoped to include coverage within areas of the revised layout not covered by the Phase 1 Probing. The probing was initially undertaken on an approximate 100m grid, with a tighter grid where peat was recorded in proximity to the proposed development.

The peat probing location plan, incorporating both Phase 1 and Phase 2 probes and resultant depths can be found on drawings in Appendix A.

Phase 1 Peat Probing (Locogen Consulting Results)

Peat probing was generally undertaken on a 100m grid across the site. The majority of the peat depths were recorded to be less than 0.5m. Two areas were noted to contain deeper peat with depths of more than 1m and as deep as 4m. Drawings 161624-PC-9103 and 161624-PC-9104 outline the Peat Probing Depth and the Peat Heat Map, respectively. The results of the probing of the 2 areas of deeper peat are as follows:

Area 1

Area 1 is situated towards the northwest of the site between Findlay's Seat and Hunt Hill (centred on E328069.9, N854151.3). This area of peat coincides with an area of peat recorded by the BGS. This area of peat is located topographically lower than the proposed wind turbines and therefore unlikely to have an effect on the proposed wind farm. Peat was recorded to have a minimum depth of 0.5m around the boundaries of the area, with a maximum depth of 4m (E328024.4, N854085.6). The deep peat is situated on a shallow slope angle (generally $\lesssim$2°).

Towards the south of Area 1, the existing access track situated between wind turbine 6 and 7 (crossing through Area 1) typically records peat / peaty soils to be between 0.3m and 0.7m depth. However, one peat probe recorded deep peat to be 3.4m deep (E327918.0, N853684.0), located downslope from an existing access track. The existing track is to remain largely unchanged. It has been reported by others that the track is considered to be in good condition and suitable for the proposed development. It is considered, however, that the current access track is potentially constructed on top of the peat, and therefore it is important that its presence is acknowledged within the detailed track design. It is noted that sections either side of the existing track are to be re-aligned/improved and as such peat may be encountered local to this area.

No samples were collected as part of this phase.

Area 2

Area 2 refers to the area of peat to the west of Hunt Hill (centred: E327262.2, N854032.9). This area is also situated on land at a topographically lower level than the proposed wind turbines. Peat was recorded to range in thickness between 0.5m and 0.7m, with two probes recording depths of 1.1m and 2m. This area is noted to have an increased angle between 4° and up to 12°.

No samples were collected as part of this phase.

Outwith Area 1 and 2

Outwith Areas 1 and 2, an additional individual 10 Phase 1 Peat Probes recorded localised pockets of peat depths of over 0.5m, typically ranging between 0.5m and 0.7m. A peat probe recorded peat (1.2m depth) within the assumed basin of Whities Stripe burn, southwest of Area 1. The probe is situated on a topographically lower level than the access track to (Turbine 7) and given its localised nature is not considered to be a risk to the proposed wind farm development.

Where the BGS recorded peat to be present at the location correlating with Wind Turbine 3, the probing results showed no depths to be greater than 0.30m, thus peat at this location is likely to be shallow overburden/peaty soils. Similarly, the additional area of peat that was highlighted by the BGS between Turbine 1 and 2 did not record overburden depths greater than 0.3m.

Phase 2

Phase 2 peat was scoped to ensure the peat probing encompassed all areas of the proposed development and to decrease the grid spacing of probes within recorded peat areas. Conditions were recorded to be consistent with the Phase 1 Peat Probing, recording the majority of peat depths to be less than 0.5m. Two additional areas of deeper peat were however identified. These areas are discussed below and are shown on drawing 161624-PC-9103 and 16124-PC-9104.

Area 3

An additional pocket of deeper peat was noted to be present towards the south of the access track leading to the transformer / battery storage area, noted as Area 3 on drawing 161624-PC-9103 and 161624-PC-9104, centred on E329926.2, N853780.9). Peat in this area was recorded to extend to 3.6m depth from surface and appears to be contained within a gully. A sample was collected using a Russian Corer at 1.55m to 2.05m depth, describing the deep peat to consist of very soft dark brown slightly clayey pseudo fibrous PEAT. The laboratory result classed the sample to be H7 (out of 10) on the Von Post Classification Scale: “Highly Decomposed Peat containing a lot of amorphous material with very faintly recognisable plant structures”. The peat appears to taper out towards the north of the track to a depth of 0.5m or less and therefore can be classified as peaty soils to the north. The majority of the deep peat is situated on a slope angle between 0° and 2°. The area of peat towards the south of the track is bound by the gully, which has slope angles steeper than 15° towards the west of the area and typically situated between 4° and 15° on the east of the area. North of the track, where shallower peat is present, the slope angles are typically within 2° to 4°, increasing to angles of 4° to 8°. The slope dips towards the track.

It has been reported by others that the existing access track north of Area 3 is in good condition and suitable for the proposed development, and therefore is to remain largely unchanged. It is however considered that the current access track is potentially constructed on top of the peat and it is therefore important that its presence is acknowledged within the detailed track design. It is noted that sections of this track to the east and west of the existing track are to be re-aligned/improved and peat may be encountered local to this area.

Area 4

Deeper peat, although shallower than Area 3 was also encountered within the area referred to as Area 4 on drawing 161624-PC-9103 and 161624-PC-9104, centred on E328569.81, N853030.58. The peat in this area was recorded to be up to 1.2m depth and was also recorded to be confined to a gully with no peat recorded outwith the gully. An existing access track to turbine 2 is situated 100m south of the gully, however, the current design states this road will be realigned to suit turbine 2. A sample was taken

between 0.5m and 1.0m depth, comprising very soft dark brown slightly clayey pseudo fibrous PEAT. The peat was classified as H7 (out of 10) on the Von Post Classification Scale: "Highly Decomposed Peat containing a lot of amorphous material with very faintly recognisable plant structures". The peat situated in this area recorded slope angles to sit generally between 2° and 8°, increasing to between 8° and 15° where peat tapered out towards the outer extents of the gully.

Outwith Areas 3 & 4

Outwith Areas 3 and 4, no other significant areas of peat were recorded. Four probes recording peat at sporadic locations, often only surpassing the 'peaty soils' threshold by a maximum of 0.20m, typically recording depths between 0.55m and 0.70m. This peat was generally on down slope areas in relation to the current proposed turbines.

Substrate

The BGS Superficial layer within the GeoIndex highlighted the presence of glacial till across the majority of the site. It is considered that, where deep peat has been encountered within Areas 1 to 4, that this is most likely underlain by glacial till.

Where no superficial geology has been recorded by BGS, it is considered that the overburden / peaty soils are underlain by the Spey Conglomerate formation. Wind Turbines 6, 9, and 11 (and their associated access tracks) are considered to have no superficial geology, situated adjacent towards the east of Area 1. The probes progressed within the area considered to have no superficial geology extend to a maximum depth of 0.6m, likely considered to be thick overburden if not peaty soils.

Recorded Peat recorded at Proposed Turbine Locations

Table 4 below provides a breakdown of the maximum peat depths in proximity to the proposed turbines. Given the recorded depth these deposits are considered to be representative of peaty soils/ topsoil and therefore are not considered to represent a constraint to the proposed turbine layout.

Table 3: Wind Turbines Maximum Peat Depth within the proposed area and within its surrounding area.

Wind Turbine	E	N	Max Peat Depth (m)	Max Peat Depth within ~150m (m)
1	328975.29	855376.79	0.2	0.35
2	328542.81	854715.1	0.2	0.2
3	329214.39	853690.88	0.2	0.2
4	329575.34	853251.81	0.3	0.2
5	328597.93	853271.4	0.1	0.2
6	328301.88	853740.98	0.1	0.5
7	327650.47	853876.78	0.6	0.6
8	327475.59	854326.63	0.4	0.6
9	327961.71	853139.98	0.4	0.7
10	328775.35	852676.81	0.3	0.35
11	328138.7	852710.72	0.3	0.4
12	328350.31	852176.78	0.2	0.4

3. Peat Slide Risk

Given the minimal depths established over much of the site, and upon review the prevailing conditions determined through geology and superficial mapping, the shallower peat depths outwith the Areas 1 to 4 will largely be considered as peaty soil/overburden deposits and thus are of negligible risk in terms of slide potential. The risk is based on the substrate, the slope angle, and the depth of the peat, as described in the table below. It should be noted that the majority of the deep peat identified area situated on a shallow slope gradient.

Table 4: Peat Slide Risk Rating

Potential stability risk	Description	Action
Very low risk	Slope:<2°; or sloping away from proposed design Depth: <0.5m (peaty / organic soils) Substrate: Sand/gravel, rock substrate, or very stiff glacial till	No mitigation required. See Peat Management Plan as per section 4.2 to be followed in the event peat is encountered in areas outwith the probing undertaken.
Low risk	Slope: 2° ≤ 4° Depth: 0.5m – 1.5m (thin peat) Substrate: Sand/gravel, rock substrate, or very stiff glacial till	No mitigation required but with additional considerations to be adopted within design. Peat Management Plan as per section 4.2 to be followed.
Medium risk	Slope: 4° ≤ 8° Depth: 0.5m – 1.5m (thin peat), >1.5m (deep peat) Substrate: Sand/gravel, rock substrate, or very stiff glacial till, or clay, or not proven	Additional mitigation required to either avoid or remove peat OR further additional detailed ground investigation/ slide risk assessment required.
High Risk	Slope: 8° ≤ 15° or above Depth: 0.5m – 1.5m (thin peat) situated on steep slopes, >1.5m (deep peat) Substrate: Any of the above or not proven. Any evidence of slip material or evidence of previous	The area should be avoided. If unavoidable, detailed investigation and quantitative assessment required to determine stability and sensitivity to minor changes in strength and groundwater regime combined with long-term monitoring.

Further discussion on Areas 1 to 4 is provided below.

Area 1

Area 1 is noted to contain deep peat. This area is situated predominantly below the slope instability threshold for (deep) peat (<2°). Towards the south of this area, the peat shallows out to between 0.5m and 1.0m where the slope angle increases to between 4° and 8°.

Area 1 was recorded during Phase 1 Peat Probing and any slide risk associated with this area has been mitigated by avoidance of the hazard with the proposed wind farm layout altered so that no turbines or infrastructure are proposed within Area 1. The closest turbines to Area 1 are turbine 6, 7, and 8, at a distance of 180m to northwest, 130m to southeast, and 240m to northeast, respectively. These three turbines are situated uphill from Area 1, and as such, the deeper peat areas as described are thus avoided.

A ~200m section of existing track crosses through Area 1 and is to remain largely unchanged given that it has been reported by others to be in good condition and suitable for the proposed development. It is considered that the current access track situated between Turbine 6 and 7 could potentially be constructed on top of peat, and therefore it is important that its presence is acknowledged within the detailed track design to ensure that it is suitable for its intended traffic loading. This stretch of existing road is situated in a depression in relation to the two turbines, though situated at the same elevation or higher in relation to the peat. The deepest peat recorded within <50m of the existing track was 0.6m, however, 66m towards the southwest of the track, peat extended to 3.4m depth. This probe of deep peat is situated at a lower elevation than the existing track and thus unlikely to affect the proposed layout.

The proposed access tracks for Turbine 6 and 7, and also for Turbine 8, are outwith an area that recorded deep peat. These tracks are situated 50m and 130m from Area 1, respectively, as well as at a higher topographical level.

It can therefore be concluded that Area 1 is considered to be **very low risk** with respect to peat slide to the proposed development and as such no further mitigation in this regard is required.

Area 2

Area 2 is noted to contain peat (>0.5m and <2.0m depth), situated within the slope instability threshold for peat >2° as described in Table 2. The angle was denoted to be as steep as 8° in areas with recorded peat. As with Area 1, the peat was recorded during Phase 1 Peat Probing and the risks have been since been mitigated by avoidance of the hazard. The proposed wind farm layout has been altered so that no turbines or infrastructure are situated within Area 2. The closest point of the proposed access track is ~130m towards the east, where Turbine 8 is situated ~140m towards the east and Turbine 6 is situated ~250m towards the east from Area 2.

As with Area 1, proposed Turbines 8 and 6 are currently proposed uphill from Area 2. Therefore, in the unlikely event that an instability event were to occur, the slide would 'flow' away from the proposed turbines. It can therefore be concluded that, although Area 2 is considered to have a higher likelihood of instability given its slope angle, the area is to be considered **very low risk** with respect to peat slide risk to the proposed development, and as such, no further mitigation in this regard is required.

Area 3

The peat (>0.5m and <3.2m depth) within Area 3 is situated within a gully to the south of the access track leading to the transformer / battery storage area, though tapers out towards the track to the north. The slope angle is noted to be predominantly below the peat failure threshold of 2°. Where peat was noted to be >2°, the slope angle was only marginally above 2°. In addition, the deep peat is confined by a gully, situated downslope from the proposed development. In the unlikely event that a peat failure was to occur, it is likely that this will be confined to the gully within which it is situated. The closest Wind Turbine (4) is situated 400m towards the southwest of the site and uphill from the gully in question.

It is considered that the access track to the north of the gully has potentially been constructed on top of the peat. No significant alterations to this track are currently proposed given it has been reported by others to be in good condition and suitable for the proposed development. The potential presence of peat beneath the track should however be carried forward to the detailed track design to ensure that the design is suitable for the proposed traffic loads. Nevertheless, based on the information presented, the deep peat within Area 3 is considered to be a **very low risk** to with respect to peat slide to the proposed development and as such no further mitigation in this regard is required.

Area 4

Lastly, Area 4 noted the presence of peat within a gully. The peat was found to be localised within this gully to a recorded depth of between 0.7m and 1.2m. South of this area is the proposed access track for Wind Turbine 10, situated ~65m towards the south. Turbine 10 is situated ~400m towards the southeast of the site. The slope angles are noted to be between 4° and 8°, with the gully dipping towards the track. The probes within closer proximity to the access track did however record overburden depths to be ~0.1m, thus the peat significantly tapers out towards the access track. The gully is situated at a higher level than the proposed access track. Taking this into account along with the slope angles and size of area, the potential for the failure to impact the proposed development is considered to be **low risk**.

Overall Statement on Peat Slide Risk

Based on the above assessment, it is considered that there is low to very low risk of peat slides to the proposed development layout, whereby no specific design mitigation is required. The risks in Areas 1 and 2 have largely been mitigated by avoidance. In Areas 3 and 4, the risks are mitigated by the fact that the peat is confined by its topography (within gullies).

It is noted that peat may be present beneath the existing access tracks within Area 1 and to the north of Area 3. While no changes are currently proposed to these tracks, the presence of peat should be carried forward to the detailed design to confirm the current access track is suitable for the proposed traffic loadings. In addition, a proposed new access track is present south of Area 4, where a track is proposed to cross the gully within which the Area 4 peat is likely contained. There is a potential for shallow peat to be encountered in this area, although it is expected that this would be of limited risk given that the probes undertaken in proximity to the proposed access track recorded peat to be ~0.2m.

It is acknowledged that peaty soils/overburden are present across the windfarm. These soils are however recorded to be of limited thickness and therefore are not considered to pose additional slide risk to the proposed development. Their presence will have to be acknowledged/confirmed as part of the detailed design with appropriate soil management plans put in place to mitigate any additional risk to construction.

On the basis of the above assessment, a more detailed peat slide risk assessment is not considered to be required.

4. Mitigation

As noted in Section 3, the results of the peat slide risk assessment have confirmed that no significant peat slide risks exist at the site. Despite this, peat is still present in certain areas of the wider site and thus including a discussion with regards to mitigation is considered appropriate. The National Planning Framework 4 (NPF4) and the Scottish Government Guidance on Peat Landslide Hazard and Risk Assessments for Proposed Electricity Generation Developments outlines the mitigation hierarchy to which all development proposals should adhere to:

- Avoid – by removing the impact at the outset.
- Minimise – by reducing the impact.
- Restore – by repairing damaged habitats.
- Offset – by compensating for residual impact that remains, with preference to onsite over offsite measures.
- Enhance – Biodiversity, including by restoring degraded habitats and building and strengthening networks.

Figure 1.1 and Section 1.7 in the Scottish Government Guidance highlights the option to exit the hazard assessment process where minimal peat cover is identified and confirmed by site reconnaissance. Teindland is considered to have minimal peat cover in proximity to the proposed development, and where present in the wider area is considered to have a low to very low risk to the proposed design whereby no more detailed peat slide risk is considered to be required.

A discussion of the mitigation that has/should be applied is provided below.

4.1 Design Mitigation

A discussion on the relevant mitigation to the proposed windfarm at Teindland is provided below:

Avoid

Where possible, peat should remain in place to avoid conducting works in these sensitive areas.

The proposed development has completely avoided disturbance of the deep peat deposits as recorded by the Phase 1 and Phase 2 Peat Probing. While it is noted that existing access tracks are present in proximity to Areas 1 and 3, these tracks are already in place and as such no disturbance of the deep peat deposits in these areas is proposed. Furthermore, probes undertaken closest to the access tracks in these areas have recorded peat thicknesses to be shallower suggesting that peat is tapering out towards these features, further supporting the fact that deep peat deposits are avoided by the proposed wind farm development.

Minimise

Given that the peat probing results have confirmed that the proposed wind farm development has avoided the recorded deep peat deposits, no further specific mitigation to minimise impact is considered to be required.

Though it is considered that significant peat is unlikely to be encountered during the construction of the access tracks and turbines, some sporadic peat may still be present throughout the site that has not been recorded by the probing to date. In the event that peat is encountered, it is considered that the

most suitable mitigation against the risk of settlement is the removal of peat from the development area or in the unlikely event of encountering deeper peat (>1.5m depth) the construction of a floating road.

Restore / Enhance

If peat deposits are encountered during construction works, these should be retained on site for use within peatland restoration works in the wider site. It is understood that as part of the works on the site, despite disturbance having been avoided, there is a desire to enhance the peatland habitats recorded in Areas 1 and 2 of the site. The specific design and details of peat restoration works are to be confirmed with FLS and their habitat specialists in due course.

It should be noted that peaty soil/topsoil will be encountered across the development area and a suitable methodology for the storage and use of these soils during future re-instatement or an alternative use will have to be explored through the development of a general soil management plan.

Forestry Research Plots are present on site as presented in 161624-PC-9102. Area 1 peat overlaps with a research plot, situated ~250m north of Wind Turbine 9, centred on E328060.0, N853531.9. Six additional research plots are present within the site. Between Wind Turbine 2, 3 and 6, there is a forestry research plot situated outwith the site boundary (i.e., no development proposed within this plot), centred on E328692.2, N853976.6. Wind Turbine 2 is situated ~170m north of the research plot, where Wind Turbine 6 is situated 100m towards the southeast and Wind Turbine 3 situated adjacent to it. Another forestry plot is situated adjacent to a proposed access track between Wind Turbine 5 (70m north) and bordering the access track (E328540.21, N853435.14). Four additional plots are situated towards the north of the site within the site boundary but away from the design, centred on E329144.4, N856196.7; E329852.2, N856311.7; E329776.6, N856562.7 and E330121.4, N855050.3.

The current design does not overlap with any of the Forestry Research Plots present on site. If there are design changes and these will overlap with such plot, consultation with FLS should be sought.

4.2 Peat Management During Construction

Whilst it is considered that the existing deep peat deposits will not be disturbed by the proposed development, it is considered important to outline an appropriate management plan to be followed in the event that peat or peaty soils are encountered during construction. The peat management is based on the SEPA Good Practice guidelines, stating that these should be followed if peat is to be reused or reinstated with the intention that the habitat it supports continues to be valuable. Peat reuse, reinstatement and / or restoration should always be considered where possible.

The main objectives of the Peat Management are to outline how any peat if encountered is expected to be excavated and managed during the construction of the wind farm.

Excavation

Where peat is excavated, the following should apply:

- Excavated peat should be excavated as turves, including the acrotelm (surface vegetation) and a layer of adjoining catotelm (humified peat) typically up to 300mm 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
- Contamination of excavated peat with substrate materials should be avoided

- Consider the timing of excavation activities to avoid very wet weather, to minimise the likelihood of excavated peat remoulding into peat slurry (with potential consequences off site)

Storage

Excavated peat can temporarily be stored, though consideration should be given to the risk of dehydration given that once it is dried, it will not rewet. The following should be adhered to when storing peat:

- No peat will be placed on access track verges where the local topography is steep and / or a watercourse is in close proximity
- Peat turves should be stored in wet conditions, for example, within waterlogged former excavations, or should be irrigated in order to prevent desiccation. Peat should therefore be laid only to a thickness and slopes that maintains hydrological conditions and to prevent drying out. Peat will not be used as a thin layer or on steeper non-peat slopes as this promotes dehydration. Low verges and landscaping will be formed to permit surface water to drain off the access tracks
- Peat should be stockpiled in large volumes to minimise exposure to wind and sun which can lead to desiccation, but with due consideration for slope stability
- Excavated topsoils should be stored on geotextile matting to a maximum of 1.00m thickness
- Stores of non-turf (catotelm) peat should be bladed off to reduce the surface area and desiccation of the stored peat
- Peat storage areas and areas of steep peat should be monitored during periods of very wet weather, or during snowmelt, to identify early signs of peat instability

Transport

Movement of excavated turves should be kept to a minimum, and it is preferable to transport peat intended for translocation to its destination at the time of excavation. If vehicles 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.

Reuse and Restoration

Reuse and restoration of the excavated / disturbed peat should be sought where possible as this will promote biodiversity, wildlife, and improves the carbon balance of the development. The following is recommended:

- The evaluation of the potential for peat to be reused and restored for areas within the site for their suitability should be in consultation with FLS and their habitat specialists. Areas 1 and 2 are considered to be potentially suitable habitats for enhancement, however, the exact details of proposed enhancement works are to be agreed with FLS prior to reuse and restoration
- Reuse and restoration should be conducted concurrently with construction, rather than at its conclusion
- Reuse, restoration, and revegetation works should be undertaken outside winter months

Monitoring

Where peat habitat restoration is to be implemented, monitoring might be required to ensure the restoration continues to have a positive impact on the habitat as this often is a slow process. Monitoring

refers to the ongoing restoration measures and inspection of the integrity of the proposed scheme. This should be placed around major scheme components within peat to check for water table drawdown.

Settlement of floating tracks – if constructed – during and post-construction should also be monitored to determine if consolidation is occurring as expected, and to identify signs of lateral displacement. This would apply to the existing tracks thought to have been constructed above peat.

Comprehensive inspection and maintenance records should be kept for all floating tracks on site to enable reasons for track degradation to be identified.

There should be a commitment to the monitoring of rehabilitating peatland through the life of the development, given the typical timescale for peat restoration projects to achieve their objectives (from 5 to 30 years).

5. Conclusion

Four areas have been highlighted to contain deep peat, referred to as Areas 1 to 4, observing depths of between 0.6m and 4.0m. Further details are provided in Table 6 below:

Table 6: Summary of Peat Assessment

Area	Location (distance to nearest turbine/access track)	Peat Thickness (Range (m))	Description (Type)	Mitigation	Risk to Proposed Wind Farm
1	Existing access track crosses area Wind Turbine 8 (130m W)	0.5m – 4.0m	Peat and Deep Peat (no samples taken)	Avoidance – Proposed Turbines located 130m to southeast (Wind Turbine 8). Existing access track situated between Wind Turbines 6 and 7 crossing Area 1 but no amendments proposed within current design.	Very Low
2	Proposed track (130m E), Wind Turbine 8 (~140m E)	0.5m – 2.0m	Peat and Deep Peat (no samples taken)	Avoidance – Proposed Turbines and access tracks situated on a higher elevation, therefore the design has avoided the peat.	Very Low
3	Existing access track crosses area Wind Turbine 4 (400m SE)	0.5m – 3.4m	Peat and Deep Peat; (H7 (Von Post))	Minimise – Peat confined to existing gully. Existing access track potentially goes over peat but risks of further disturbance mitigated by re-alignment of track either site. Potential settlement risk to be taken forward to detailed track design. Potential for localised peat to be encountered in proximity – peat management plan to be followed.	Very Low
4	Proposed Track (65m S) Wind Turbine 4 (400m SE)	0.5m – 1.2m	Peat; (H7 (Von Post))	Avoidance - Peat appears to be confined to existing gully and current layout avoids Area of peat, however the peat is located upslope of the proposed access track. Also potential for localised peat to be encountered in proximity – peat management plan to be followed.	Low

Where existing access tracks are assumed to be within an area of peat (i.e., at Areas 1 and 3), it is assumed that the track has been constructed on top of the peat present. The current design does not entail realignment of the track within the peat. A detailed inspection and subsequent track design will be required to assess settlement and to ensure that the proposed traffic loads can be accommodated.

Some sporadic peat may still be present throughout the site between probing locations that may be disturbed/encountered by the construction works. Any peat encountered should be retained on site and utilised in restoration and enhancement of the existing deep peat habitats in agreement with FLS and their habitat specialists.

In the event that peat is encountered, the peat management protocols outlined in Section 4.2 of this Report should be followed.

Detailed ground investigation will be required to inform the detailed design of the proposed turbine bases/foundations and access roads going forward.

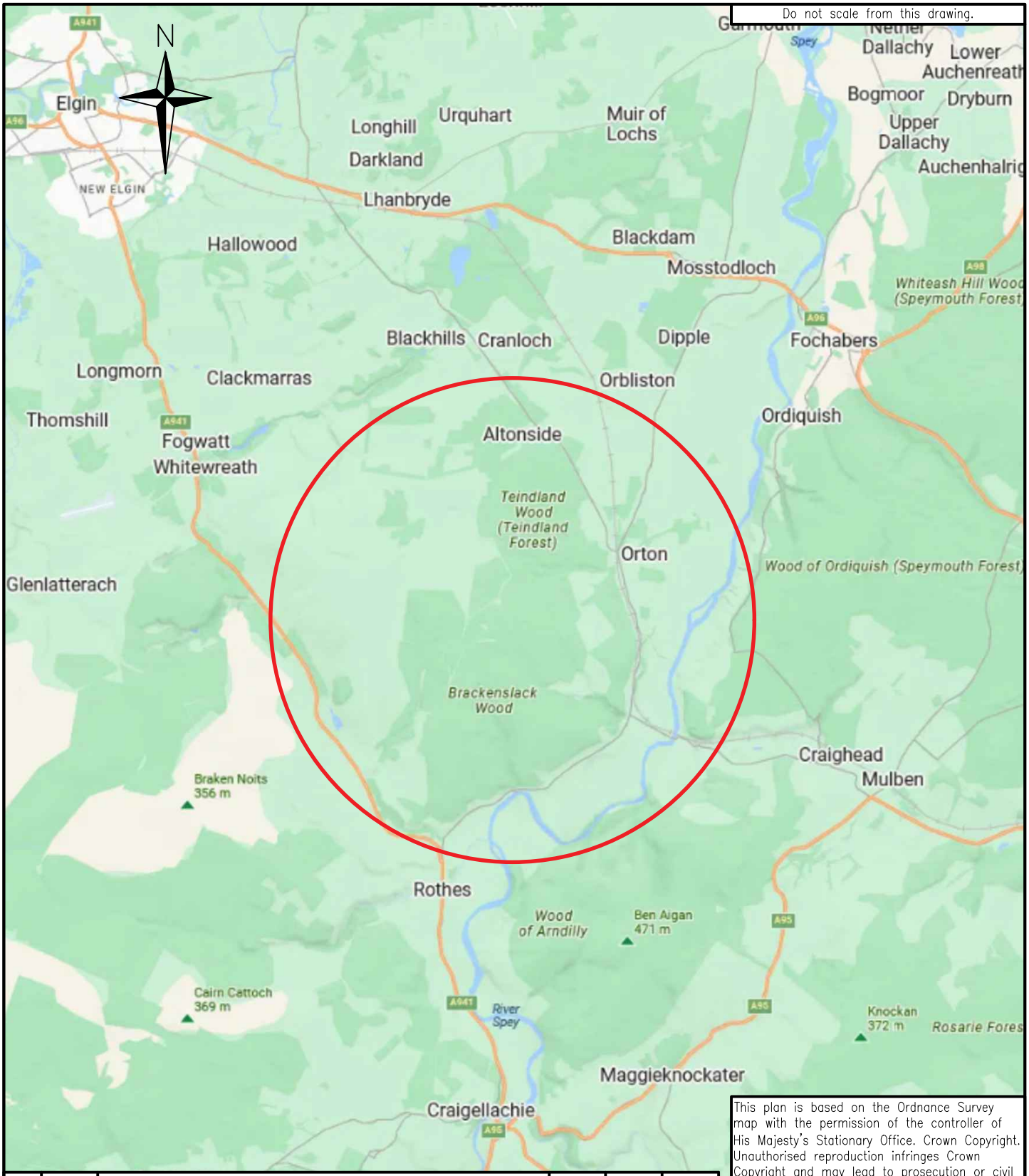
6. References

- Peat Landslide Hazard and Risk Assessment: Best Practice Guide for Proposed Electricity Generation Developments, Second edition, 2017. Scottish Government
- Ordnance Survey Terrain Model supplied by client
- Ordnance Survey - online
- A risk-based approach to peatland restoration and peat instability. Mills, A.J and Rushton, D. 2023 NatureScot Research Report 1259
- British Geological Survey - online GeoIndex and available online mapping
- https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/Scotland's Environment

Appendix A

Drawings

Do not scale from this drawing.



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Rev.	Date	Description	Drawn	Checked	Approved

Envams

Project Title:

TEINDLAND WINDFARM PEAT ASSESSMENT AND MANAGEMENT PLAN

Drawing Title:

SITE LOCATION PLAN

FAIRHURST

4th Floor, 300 Bath Street,
GLASGOW, G2 4JR
Tel: 0141 204 8800

Scale at A4:	Status:	
NTS	For Information	
Drawn:	**Checked:**	**Approved:**
CMCC	IDG	KW
Date:	**Date:**	**Date:**
24/02/25	24/02/25	24/02/25

Drawing No.: 161624/9101

Revision: –

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N

EXISTING ACCESS TRACK

CONSTRUCTION COMPOUND AREA

SITE BOUNDARY

FORESTRY RESEARCH PLOTS

AREA 1

AREA 2

FORESTRY RESEARCH PLOT

MET MAST

FORESTRY RESEARCH PLOTS

AREA 3

TRANSFORMER LOCATION

BESS LOCATION

AREA 4

1 2 3 4 5 6 7 8 9 10 11

LEGEND

PROPOSED WIND TURBINE ACCESS ROUTE ALIGNED ON EXISTING FORESTRY TRACKS : (EXISTING TRACK TO BE CONFIRMED IF SUITABLE)

PROPOSED WIND TURBINE ACCESS ROUTE : (NEW TRACK)

ACCESS ROUTES : (NORTH / SOUTH OPTIONS)

PROPOSED WIND TURBINE TOWER LOCATION — easting / northing

INDICATIVE LAYDOWN ORIENTATION. SIZE T.B.C. ON MANUFACTURES REQUIREMENTS

SCOTTISH WATER CRUSHLEY SENSITIVITY AREA

KEYHOLE LEGEND

106.1m radius KEYHOLE (200m Tip Height) DENOTED THUS :

71.4m radius KEYHOLE (230m Tip Height) DENOTED THUS :

FORESTRY TREE LEGEND

UNSTABLE DENOTED THUS :

MODERATELY STABLE DENOTED THUS :

STABLE DENOTED THUS :

Rev.	Date	Description	Drawn	Checked	Approved
A	06/05/25	UPDATED TURBINE NUMBERING.	AC	IDG	KW

Notes:

Client: Envams

Project Title: TEINDLAND WIND FARM PEAT ASSESSMENT

Drawing Title: PROPOSED DEVELOPMENT PLAN

FAIRHURST
4th Floor, 300 Bath Street,
GLASGOW, G2 4JR
Tel: 0141 204 8800

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1:10000	For Information	
Drawn: CMCC	Checked: IDG	Approved: KW
Date: 24/02/25	Date: 24/02/25	Date: 24/02/25

Drawing No.: 161624/9102 Revision: A

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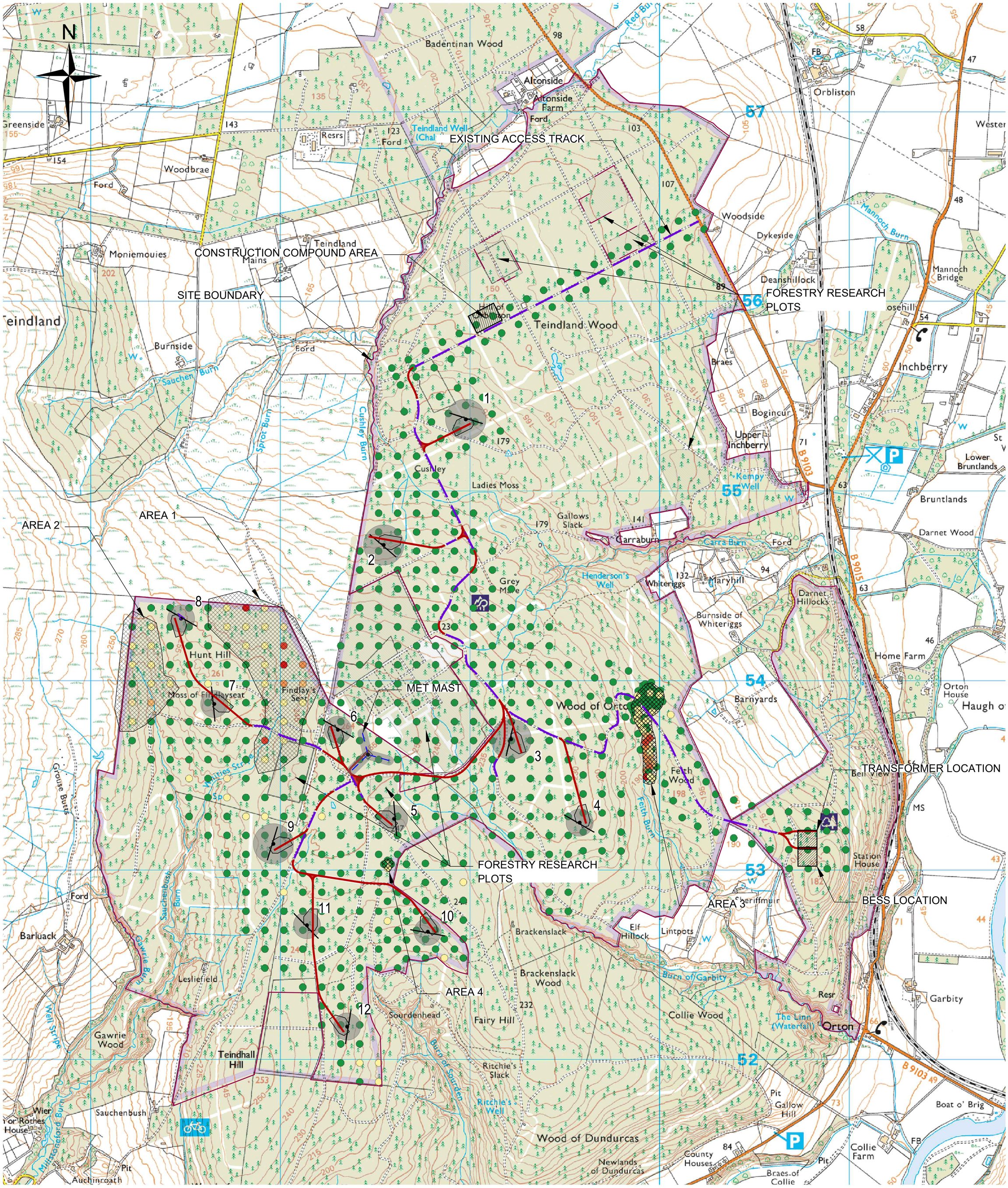

LEGEND

PROPOSED WIND TURBINE ACCESS ROUTE ALIGNED ON EXISTING FORESTRY TRACKS : (EXISTING TRACK TO BE CONFIRMED IF SUITABLE)

PROPOSED WIND TURBINE ACCESS ROUTE : (NEW TRACK)

ACCESS ROUTES : (NORTH / SOUTH OPTIONS)

INDICATIVE LAYDOWN ORIENTATION.

PEAT DEPTHS

- < 0.5m
- 0.5m - 1.0m
- 1.0m - 1.5m
- 1.5m - 2.0m
- 2.0m - 2.5m
- 2.5m - 3.0m
- 3.0m - 3.5m
- > 3.5m

AREAS OF PEAT

Rev.	Date	Description	Drawn	Checked	Approved
A	06/05/25	UPDATED TURBINE NUMBERING.	AC	IDG	KW

Notes:
1. PHASE 1 PEAT PROBING UNDERTAKEN IN AUGUST 2021. PHASE 2 PEAT PROBING UNDERTAKEN IN NOVEMBER 2024. RESULTS OF BOTH PHASES AS SHOWN.

Client: Envams

Project Title: TEINDLAND WIND FARM PEAT ASSESSMENT

Drawing Title: PEAT PROBE DEPTH

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Drawing No.: 161624/9103 Revision: A

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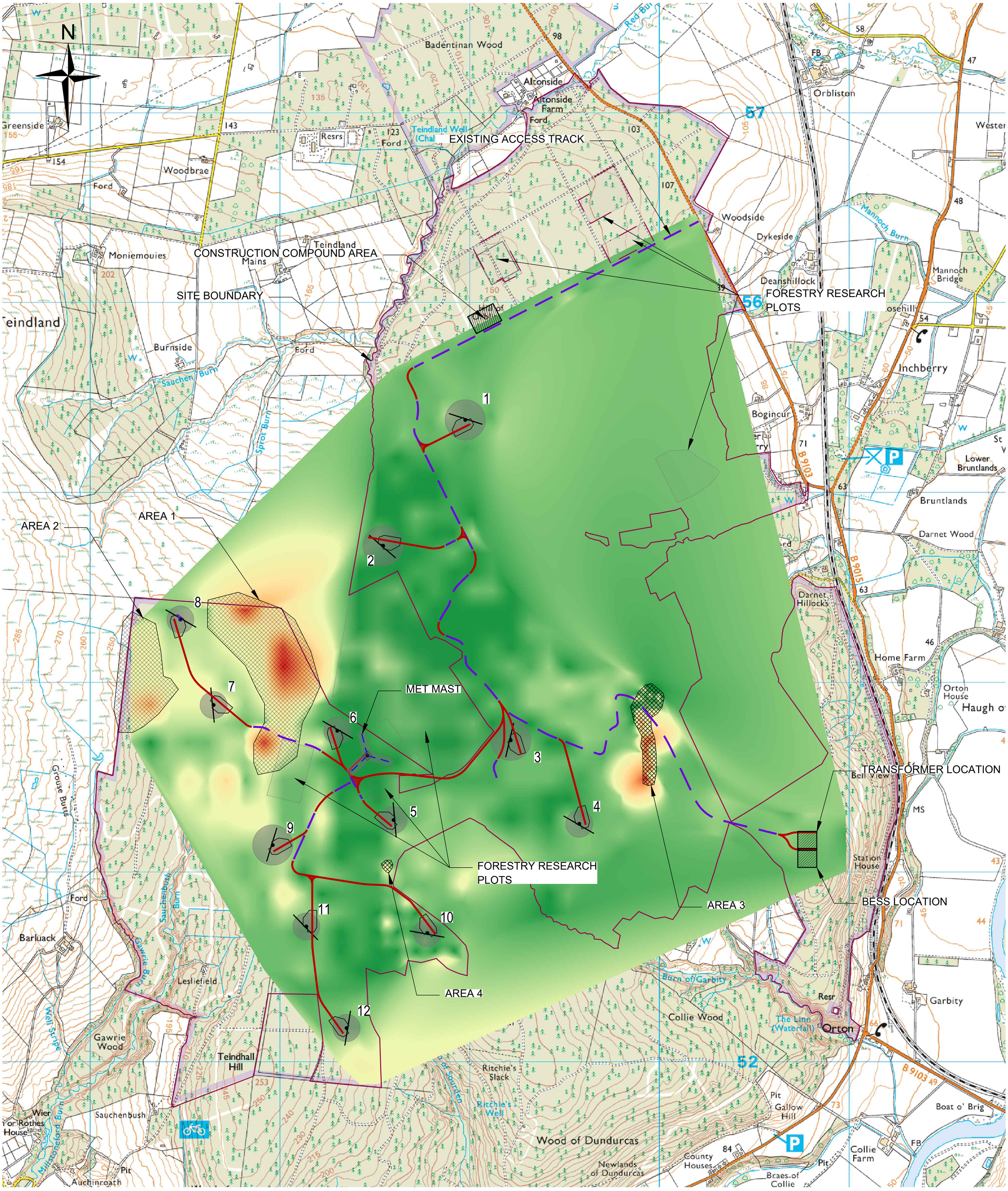

LEGEND

PROPOSED WIND TURBINE ACCESS ROUTE ALIGNED ON EXISTING FORESTRY TRACKS : (EXISTING TRACK TO BE CONFIRMED IF SUITABLE)

PROPOSED WIND TURBINE ACCESS ROUTE : (NEW TRACK)

ACCESS ROUTES : (NORTH / SOUTH OPTIONS)

INDICATIVE LAYDOWN ORIENTATION.

PEAT DEPTH

- 0.0m
- 0.5m - 1.0m
- 1.0m - 1.5m
- 1.5m - 2.0m
- 2.0m - 2.5m
- 2.5m - 3.0m
- > 3.0m

AREAS OF PEAT

Rev.	Date	Description	Drawn	Checked	Approved
A	06/05/25	UPDATED TURBINE NUMBERING.	AC	IDG	KW

Notes:
THE PEAT HEAT MAP IS BASED ON THE PROBING AS DEPICTED ON DRAWING 161624-PC-9103.

Client:
Envams

Project Title:
TEINDLAND WIND FARM PEAT ASSESSMENT

Drawing Title:
PEAT HEAT MAP AND LOCATION OF CONFIRMED PEAT AREAS

FAIRHURST
4th Floor, 300 Bath Street,
GLASGOW, G2 4JR
Tel: 0141 204 8800

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Date:	Date:	Date:	
24/02/25	24/02/25	24/02/25	
Drawing No.:			Revision:
161624/9104			A

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