Blair Hill Wind Farm

Technical Appendix 10.4

Outline Peat Management Plan

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Contents

1 Introduction

1.1 Background

1.1.1 This Stage 1 (Outline) Peat Management Plan (PMP) has been prepared by ITPEnergised on behalf of Renewable Energy Systems Ltd (RES) (the Applicant) for the proposed Blair Hill Wind Farm (the Proposed Development), located in Dumfries and Galloway (D&G) Council area, approximately 2.7 km north of the town of Newton Stewart, shown in Drawing 1.

1.1.2 The Proposed Development will comprise 14 three-bladed horizontal axis wind turbines and associated infrastructure, shown in Drawing 2.

1.1.3 The PMP has been undertaken by Dr. Chris Marshall, Principal Consultant at ITPEnergised. Chris holds a BSc(hons) Environmental Geology, an MSc in Geochemistry and a PhD in Earth Sciences, with 8 years of experience in peatland condition and restoration monitoring and assessment including peer reviewed scientific papers, policy documents, governmental reports and membership of scientific and technical advisory groups.

1.1.4 The PMP was reviewed by David Nisbet, Head of Geology & Peat at ITPEnergised. David has a BSc in Earth Science and 12 years' experience in geology and environmental consultancy. David has led geology and peat assessments on many renewable energy and electrical transmission projects across the United Kingdom and Ireland, including PLHRA, Peat Management, Engineering Geological Assessment and Carbon Balance calculations.

1.2 Objectives

1.2.1 The aim of the Outline PMP, undertaken in accordance with generally accepted best practice guidance [1,2,3,4,5] is to ensure that there has been systematic consideration of peat management and a quantitative assessment takes place throughout the development process. The PMP is required to show:

- How, through site investigation and iterative design, the Proposed Development has been structured and designed to minimise, so far as reasonably practicable, the quantity of peat which will be extracted;
- That volumes of peat anticipated to be excavated by the Proposed Development have been considered; and
- How excavated peat will be managed.

2 Ground Conditions

2.1 Definitions of Peat

2.1.1 Peat is defined as an organic soil comprising the partly decomposed plant remains that have accumulated in-situ, rather than being deposited by sedimentation. When peat forming plants die, they do not decay completely as their remains become waterlogged due to regular rainfall. The effect of waterlogging is to exclude air and hence limit the

[1] Scottish Renewables, SEPA (2012). Developments on Peatland: Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste, Version 1.

[2] SEPA (May 2017). SEPA Regulatory Position Statement – Developments on Peat and Off-site Uses of Waste Peat) SEPA Guidance., WST-G-052. Version 1.

[3] Scottish Renewables, Scottish Natural Heritage, SEPA, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland Science, AECoW (2019). Good Practice During Wind Farm Construction, 4th Edition.

[4] Scottish Government, Scottish Natural Heritage, SEPA (2017). Guidance on Developments on Peatland: Site Surveys.

[5] Energy Consents Unit Scottish Government (2017). Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments.

degree of decomposition. Consequently, instead of decaying to carbon dioxide and water, the partially decomposed material is incorporated into the underlying material and the peat 'grows' in situ.

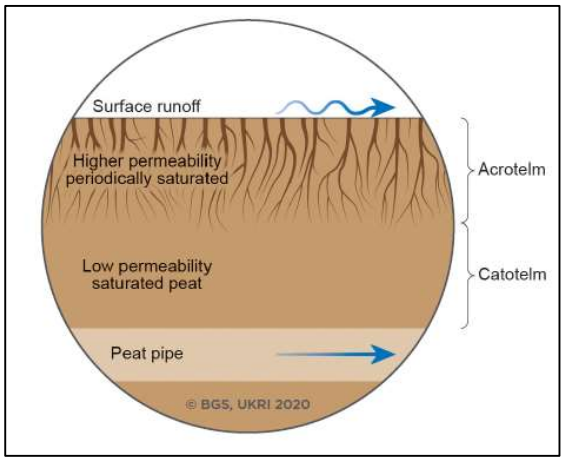
2.1.2 The Scottish Government Peat Landslide Hazard Best Practice Guide (2017) uses the following Joint Nature Conservation Committee (JNCC) report 455 'Towards an Assessment of the State of UK Peatlands' definition for classification of peat deposits:

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

2.1.3 There are two principal types of peat:

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

Plate 2-1 Typical Peat Profile



2.2 Peat Depth Assessment

2.2.1 Peat probing was undertaken across several phases, Phase I was undertaken in October and November 2023 and Phase II was undertaken in March 2024. Additional probing to survey a proposed bridge was undertaken in April 2024.

2.2.2 The surveys were carried out following best practice guidance for development on peatland[4].

2.2.3 The thickness of the peat/soils was assessed using a graduated fibre glass peat probe. This was pushed vertically into the peat/soil to refusal and the depth recorded using a handheld Trimble Global Positioning System instrument (GPS), reaching an accuracy of <1.5 m.

2.2.4 Alongside desk-based information, the 'feel' on refusal was used to interpret the underlying substrate. The following criteria was used in the field:

- Solid and abrupt refusal – Rock;
- Solid but less abrupt refusal with grinding or crunching sound – Granular (sands, gravel, weathered rock); and

- Gentle refusal – Cohesive (Clay/Silt).

2.2.5 A summary of the peat depths encountered during probing is detailed in Table 2-1 below and within Drawing 3a and 3b.

Table 2-1 Distribution of Peat Depth Recorded at the Site

Peat Depth Interval (m)	Number of Occurrences	% of Probes
Nil	46	1.5
0.01 to 0.49	2513	82.4
0.50 to 1.00	342	11.2
1.01 to 1.50	85	2.8
1.51 to 2.00	42	1.4
2.01 to 2.50	7	0.2
2.51 to 3.00	8	0.3
3.01 to 3.50	2	0.1
3.51 to 4.00	3	0.1
Total	3048	100

2.2.6 The Scotland Carbon and Peatland Map indicates that much of the Site is underlain by class 3, 4 and 5 peat soils reflecting a complex of peat, peaty soils and mineral soil. Limited areas of class 1 & 2 peatland (peatland or areas with high potential to be restored to peatland & peatland with some heath) lie to the north and south of the Site are also indicated. These areas broadly correspond to areas identified as peat by British Geological Survey (MGS) superficial deposit mapping. Much of the central part of the Site is currently covered by forestry plantation.

2.2.7 The results of peat probing show that peat deposits are limited, with 83.9% of probe locations identifying thin peaty soils (<0.5 m). A further 11.2% of the site is underlain by peat deposits (<1 m thick). Just 4.9% of the Site contains deep peat (>1m) deposits, with a maximum depth of 4 m.

2.2.8 The proposed infrastructure generally avoids areas of deep peat by design.

Table 2-2 Peat/Soil Depth at Infrastructure Locations

Infrastructure Element	Average Probe Depth (m)
T1	0.27 ± 0.16
T1 Temporary Hardstand	0.27 ± 0.17
T2	0.73 ± 0.56
T2 Temporary Hardstand	0.64± 0.39
T3	0.44 ± 0.20
T3 Temporary Hardstand	0.38 ± 0.23
T4	0.71 ± 0.60
T4 Temporary Hardstand	0.53 ± 0.29
T5	0.36 ± 0.23
T5 Temporary Hardstand	0.42 ± 0.21
T6	0.61 ± 0.25

Infrastructure Element	Average Probe Depth (m)
T6 Temporary Hardstand	0.68± 0.39
T7	0.23 ± 0.07
T7 Temporary Hardstand	0.19 ± 0.05
T8	0.52 ± 0.23
T8 Temporary Hardstand	0.35± 0.08
T9	0.39 ± 0.18
T9 Temporary Hardstand	0.43 ± 0.11
T10	0.26 ± 0.13
T10 Temporary Hardstand	0.26 ± 0.08
T11	0.24 ± 0.08
T11 Temporary Hardstand	0.28 ± 0.04
T12	0.31 ± 0.24
T12 Temporary Hardstand	0.20 ± 0.09
T13	0.21 ± 0.13
T13 Temporary Hardstand	0.25 ± 0.09
T14	0.24 ± 0.14
T14 Temporary Hardstand	0.18 ± 0.04
Temporary Batching Plant	0.47 ± 0.16
Temporary Construction Compound	0.37 ± 0.12
Control Building and Substation Compound with Hardstand Area	0.44 ± 0.21
Borrow Pit Search Area 1	0.30 ± 0.16
Borrow Pit Search Area 2	0.23 ± 0.12
Borrow Pit Search Area 3	0.25 ± 0.15
Borrow Pit Search Area 4	0.52 ± 0.30
Borrow Pit Search Area 5	0.35 ± 0.12
New Access Track - T14 – T11 - T12 Access - Substation layby - T12 Layby - T10 Access - T8 Access - T9 Access - T7 Access - T5 Access - T6 Access - T1-4 Access	 - 0.25 ± 0.15 - 0.22 ± 0.20 - 0.39 ± 0.21 - 0.33 ± 0.12 - 0.39 ± 0.20 - 0.35 ± 0.17 - 0.42 ± 0.18 - 0.11 ± 0.03 - 0.39 ± 0.28 - 0.75 ± 0.27 - 0.36 ± 0.25
Upgraded Access Track - T11 to Substation	 - 0.15 ± 0.07

Infrastructure Element	Average Probe Depth (m)
- Site Access	- 0.20 ± 0.14
- North of T7	- 0.47 ± 0.28

3 Outline Peat Management Plan

3.1.1 This Outline PMP considers the excavation of peat and organic soils across the site resulting from construction of the Proposed Development. It considers the potential for minimising excavation and disturbance to avoid or reduce any unnecessary surplus of soil and peat.

3.2 Methodology

Design Principles

3.2.1 The Scottish Environmental Protection Agency (SEPA) has provided the following hierarchy of design principles to minimise the impacts associated with the excavation of peat.

- **Prevention**: The best management option for waste peat is to prevent or limit its production. This can be done through design, positioning infrastructure in shallower peat or through consideration of alternative construction methods or engineering solutions e.g., floated roads or piling solutions;
- **Reuse** (on site or offsite for peatland restoration): Using excavated peat in construction or reinstatement (where suitable) e.g., restoration of temporary hardstand areas, verge reinstatement, screening bunds, peatland restoration etc;
- **Recycling/Recovery/Treatment**: Where peat cannot be reused on site or off site for restoration, it may be used for agricultural benefit or treated/blended with other materials to form a soil substitute or used in other relevant works. This use would require a waste management licence or registration as an exempt activity and compliance with the legal requirements;
- **Storage**: Temporary storage of peat on site (for example, during short periods in the construction phase) and then re-use. Should the peat become unsuitable for reuse during storage, it would be classed as a waste material;
- **Disposal (Waste)**: Only after all other options have been explored and discounted would this option be considered.

3.2.2 Three main stages within the development process are defined within the guidance and describe what data should be gathered and assessed to inform the site specific PMP:

- **Stage 1**: Environmental Impact Assessment (EIA);
- **Stage 2**: Post-consent/pre-construction; and
- **Stage 3**: Construction.

3.2.3 This report has been prepared in accordance with the requirements for Stage 1. In line with the above guidance, a detailed PMP would be prepared post-consent, in advance of construction and would be informed by detailed ground investigation.

4 Potential Sources of Peat During Construction

4.1.1 Reasonable efforts to minimise impact on peat and requirement for excavation of peat – while taking account of other constraints – have been made in the design process, informed by desk study, walkover observations and targeted peat depth survey work.

4.1.2 The following activities are likely to generate excavation of peat during the construction process:

- Access Tracks;
- Wind Turbine Foundations;
- Crane Hardstands;
- Substation and Construction Compounds;
- Borrow Pits; and
- Cable Trenching.

4.2 Access Tracks

4.2.1 As shown in Drawing 3, the majority of proposed new access tracks are not sited on areas of peat, with an average depth of 0.34 m. General guidance suggests that tracks should be floated on areas of peat greater than 1 m. No excavation is required on floated tracks and therefore there is no associated peat excavation. At the Proposed Development site, no tracks are sited across areas where peat depth greater than 1 m has been recorded, therefore no floated track sections are proposed.

4.2.2 Appropriate drainage will be designed to mitigate disruption to natural hydrological drainage pathways.

4.2.3 Excavated access tracks in peat require complete excavation to a competent substrate. This peat would require storage ahead of reuse alongside the track in appropriate locations. Good practice in association with excavated tracks is as follows:

- Trackside ditches should capture surface water (within the acrotelm) before it reaches the road;
- Any additional interceptor drains associated with the track construction should be shallow and flat bottomed (and preferably entirely within the acrotelm to limit drawdown of the water table); and
- Any stripped peat turves should be placed back in the invert and sides of the ditch to stabilise the banks and assist regeneration post track construction.

4.2.4 Access tracks are permanent infrastructure and therefore any excavated peat would be considered a loss, unless it can be re-used elsewhere on the site.

4.3 Wind Turbine Foundations

4.3.1 Wind turbines in peatland would generally require full and permanent excavation of peat and soils to competent strata. Temporary excavation from a wider diameter would also likely be required to gain access to the base of the excavation.

4.3.2 Any peat excavated would be considered a loss, unless it can be re-used elsewhere on site.

4.3.3 All turbines are located on peaty soils (<0.5 m), apart from T2 (mean depth 0.73 m), T4 (mean depth 0.73 m) and T6 (mean depth 0.61 m).

4.4 Crane Hardstands

4.4.1 Similarly, crane hardstands require excavation to a competent stratum, with any excavated peat considered a loss if it cannot be reused on site. All hard standings have avoided peat and are located on soils <0.5 m thick, excluding T2 (mean depth 0.64 m), T4 (mean depth 0.53 m) and T6 (mean depth 0.68 m).

4.5 Borrow Pits

4.5.1 The borrow pit search areas have been selected based on their morphology and anticipated proximity of bedrock to surface. Any excavated peat would require to be reused on site, most likely in the restoration and landscaping of the borrow pits post construction. There is no peat (>0.5 m) expected at all proposed borrow pit location with the exception of Borrow pit search area 4 (mean depth 0.52 m). Detailed ground investigation will be undertaken ahead of construction, following which preferred locations would be selected and detailed borrow pit design(s) would be developed (avoiding peat extraction).

4.6 Cable Trenching

4.6.1 Electric cabling would typically be buried/ducted in trenches alongside the proposed track network, where practicable. Should cables be buried within existing peat, excavated peat would generally be replaced at its point of origin and therefore not considered a loss.

5 Proposed Mitigation During Construction

5.1.1 There are four main types of impact on peat which can occur during construction. These are:

- Loss of structural integrity and peat strength, due to stripping off or damaging the surface vegetation turf, excavation, handling and transporting peat (particularly wet, subsurface peat);
- Erosion and gullying, caused by exposure and desiccation of bare peat surfaces primarily caused by water erosion, due to surface runoff after rainfall;
- Contamination, caused by leaks, spillages or inappropriate laydown of materials; and
- Peat slide, caused by laying wet peat on top of wet peat, laying other heavy materials (including excavated mineral soil or other construction materials) on top of wet peat or by inappropriate stockpiling, such as attempting to create stockpiles of peat that are too high, without bunding, engineering or geotechnical support.

5.1.2 A range of methods and control measures are described below which are designed to prevent these impacts from occurring. This best practice guidance should be adhered to throughout the construction phase.

5.2 Peat Excavation and Handling

5.2.1 As described previously there are two distinct layers of peat; the acrotelm (including the vegetated turves) and the catotelm. These distinct layers should be recognised during peat excavation and reuse activities.

5.3 Excavation

5.3.1 If peat is to be reused or reinstated with the intention that its supported habitat continues to be viable, the following good practice applies:

- Peat will be excavated as turves, including the acrotelm (surface vegetation) and a layer of adjoining catotelm (more humified peat) or as blocks of catotelmic peat;
- The acrotelm will not be separated from its underlying peat, if possible, the full depth of acrotelm layers from the top surface of the peat deposit should be excavated together;
- Turves will be as large as possible to minimise desiccation during storage;
- Peat derived from previously afforested areas will be transported and stored separately due to the high likelihood of disturbance/mixing of the peat structure

during afforestation and felling alongside enhanced decomposition. There is also likely to be more limited surface vegetation within these turves;
- Basal peats are likely to be enriched in mineral matter and therefore will be excavated separate to the turves where depth allows;
- Mineral soils will be transported and stored separately to reduce the risk of contamination of excavated peat; and
- The timing of excavation of peat will avoid periods of very wet weather and multiple handling of peat will be avoided to reduce the risk of peat losing its structural integrity.

5.4 Temporary Storage

5.4.1 Peat storage will only be required where reinstatement is not immediately possible, and all stored peat will be reinstated at the end of the construction phase. To ensure that the storage locations are suitable in terms of environment, construction practicality and safety, the precise location of temporary peat stockpiles will be determined at a site level following consideration and assessment of suitable areas by the Environmental Clerk of Works (ECoW)/Environmental Clerk of Works (EnvCoW), Geotechnical Engineer and contractor using the guiding principles below:

- Peat turves will be stored in wet conditions or irrigated to prevent desiccation (once dry, peat will not rewet);
- Vegetated turves will not be stacked on top of each other to avoid damage to seeds/vegetation;
- Stockpiling of peat will be in large volumes to minimise exposure to wind and sun but with due consideration for slope stability;
- Excavated peat and topsoil will be stored to a maximum of 1 m thickness (unless otherwise agreed by the Geotechnical Engineer);
- Stockpiles of peat will be isolated from any surface drains and a minimum of 50 m from watercourses, and stockpiles will not be located on areas of deep peat, in order to avoid increasing peat slide risks associated with additional loading;
- Stockpiles will include appropriate bunding to minimise any pollution risks where required. Excavated topsoil would be stored on geotextile matting to a maximum of 1 m thickness;
- Stores of non-turf (catotelm) peat will be bladed off to reduce the surface area and desiccation of the stored peat; and
- Areas of steep peat/storage will be monitored during periods of wet weather, or during snow melt, to identify early signs of peat instability.

5.5 Temporary Storage around Infrastructure

5.5.1 Where peat cannot be transferred immediately to an appropriate restoration area, short term storage will be required. The following good practice applies:

- Peat will be stored around the perimeter at sufficient distance from the cut face to prevent overburden induced failure;
- Local gullies, drainage lines, wet ground and steep slopes will be avoided;
- Stored upper turves (incorporating vegetation) will be organised and identified according to National Vegetation Classification (NVC) community (assisted by ECoW) for reinstatement adjacent to like communities in the intact surrounding peat blanket;
- Drying of stored peat will be avoided by irrigation (although this is unlikely to be significant for peat materials stored less than 2 months).

5.5.2 Where longer term storage is required (>2months) the following good practice applies:

- Peat generated will be transported directly to its allocated restoration area to minimise the volume being stockpiled, with the possibility of drying out;

- Stores of catotelmic peat will be bladed off to reduce surface area and minimise desiccation; and
- Monitoring of large areas after wet weather or snow melt.

5.6 Transport

5.6.1 Movement of turves will be kept to a minimum once excavated, and therefore it is preferable to transport peat planned for translocation and reinstatement to its destination at time of excavation.

5.6.2 If HGVs are used for transporting non-peat material and excavated peat, measures will be taken to minimise the risk of cross-contamination.

5.7 Handling

5.7.1 A detailed storage and handling plan will be prepared by the Principal Contractor as part of the construction phase PMP, including:

- Best estimate excavation volume at each infrastructure location (including peat volume split into acrotelm or 'turf' and catotelm);
- Volume to be stored locally and volume to be transferred directly on excavation to restoration areas elsewhere to minimise handling;
- Location and size of storage area relative to natural peat morphology and drainage features; and
- Irrigation requirements and methods to minimise desiccation of excavated peat during short term storage.

5.7.2 These parameters will be determined by the contractor prior to construction.

5.8 Reinstatement and Restoration of Construction Disturbed Areas

- Undertake reinstatement/relocation and revegetation works as soon as possible;
- Where required, consider exclusion of livestock from areas of site undergoing restoration;
- As far as is reasonably practicable, restoration will be carried out concurrently with construction rather than at its conclusion; and
- To ensure safe reuse, all peatland restoration works will be subject to assessment by a geotechnical specialist, ensuring that emplacement of peat will not increase the likelihood of peat instability.

6 Site Based Excavation and Management Assessment

6.1.1 This outline PMP has been undertaken as part of the Environmental Impact Assessment for the Proposed Development. The PMP aims to ensure that:

- there is a clear understanding of any peat on site;
- the total volume of peat that may be excavated is known;
- the design avoids areas of deep peat where possible; and
- the reuse of excavated materials is certain and minimised where possible, in line with industry good practice and guidance.

6.1.2 The volumes of peat detailed within this report are to be considered indicative at this stage. The total excavation volumes are based on a series of assumptions for the Proposed

Development and peat depth data averaged across discrete areas of the development. Such parameters can still vary over small scale and therefore topographic changes in the bedrock profile, historical ground disturbance etc. may impact the total accuracy of the volume calculations.

6.2 Estimated Peat Extraction and Reuse Volumes

6.2.1 Encompassing all data gathered from peat probing, aerial photography reviews and site walkovers, the total predicted volume of excavated materials has been calculated, with estimates of reuse (see Table 6-1).

6.2.2 The total peaty soil/peat volumes are based on a series of assumptions for the Proposed Development and peat depth data averaged across discrete areas of the development. Such parameters can still vary over small scale and therefore topographic changes in the bedrock profile, historical ground disturbance etc. may impact the total accuracy of the volume calculations.

Reuse

6.2.3 This section of the PMP includes methods for dealing with peat which could potentially be classified as waste (only if the material cannot be reused).

6.2.4 Excavated peat from the construction process will be reused in the following ways:

- Reinstatement of temporary infrastructure;
- Appropriate landscaping of new infrastructure e.g., track sides, hardstand etc.
- Donor material for Forest to Bog restoration including for furrow blocking, reprofiling and ground smoothing activities (not included within reuse calculations at this stage).

Table 6-1 Excavation Materials Management Plan

Infrastructure Location	Average Probe Depth (m)	Estimated Volume of Excavated Peat (m^3)	Estimated Volume of Potential Peat Reuse (m^3)	Hierarchy Adherence*	Assumptions
Tracks					
Excavated Track (New) Approximately 8.5 km of excavated track within the main turbine array.	0.36	Acrotelm: 760 Catotelm 665 Total: 1,425	Acrotelm: 5,414.3 Catotelm: 3,542.9 Total: 8,857.2	Avoidance was the first level of screening, to avoid peat (>0.5 m). Routing has been planned on shallow peat or peaty/mineral soils where possible, with only the section of track to T6 crossing areas where average probe depth exceeds 0.5 m.	Several sections of proposed new track are not sited on peat soils (>0.5 m) and are not included in the excavation calculations. Assumes 5m track width. Sections of the route may require cut and fill and these slopes would require restoration to minimise visual impact. Verge restoration either side of tracks. Assumes 1.2 m wide verge with a maximum height of 1 m, grading down to ground level (average 0.5 m). Acrotelm and turves should be used for the upper 0.3 m. Track restoration is only proposed along sections of the route where information indicates potential for peat and carbon-rich soils or peatland vegetation.
Upgraded Track Approximately 3 km of upgraded access track within the turbine array	0.27	Acrotelm: 160 Catotelm: 28 Total: 188	Acrotelm: 1,080 Catotelm: 720 Total: 1,800	Avoidance was the first level of screening, to avoid areas of peat. Routing has utilised existing tracks where possible, minimising the	Several sections of proposed track upgrades are not sited on peat soils (>0.5 m) and are not included in the excavation calculations. Assumes up to 2m widening.

Infrastructure Location	Average Probe Depth (m)	Estimated Volume of Excavated Peat (m^3)	Estimated Volume of Potential Peat Reuse (m^3)	Hierarchy Adherence*	Assumptions
				need for additional excavation.	Verge restoration on one side of track. Assumes 1.2 m wide verge with a maximum height of 1 m, grading down to ground level (average 0.5 m).
Turning Heads	0.36	Acrotelm: 576 Catotelm: n/a Total: 576	Acrotelm: 320 Catotelm: n/a Total: 320	Avoidance was the first level of screening, to avoid areas of peat.	Reuse has been partly accounted for within the access track sections described above. Assumes verge restoration along 30 m stretch of outer side of turning head (the additional length not already accounted for). Acrotelm and turves should be used for the upper 0.3 m, restoration must not impact existing, unexcavated peat.
Cable Trenching Approximately 11.7 km of cabling, of which 8.4 km is within the turbine array, with the majority of the remainder following the existing tracks.	0.34	Acrotelm: 11,908.5 Catotelm: n/a Total: 11,908.5	Acrotelm: 11,908.5 Catotelm: n/a Total: 11,908.5	Cable trenches generally following the proposed track layout which was designed to avoid peat where possible.	Any materials excavated during cable installation would be appropriately stored locally and trenches would be re-instated immediately once cables have been installed. In areas where the cable route is on rock, the site may require excavation of rock or laying cable in upfilled sections to minimise the excavation of rock. Only turbines sited on peat (>0.5 m) have been included within excavation calculations. At turbine foundations topsoil would be stripped keeping top 200 mm of turf

Infrastructure Location	Average Probe Depth (m)	Estimated Volume of Excavated Peat (m^3)	Estimated Volume of Potential Peat Reuse (m^3)	Hierarchy Adherence*	Assumptions
					intact. This would be stored adjacent to the base working area and would be limited to 1m height. Assumes base circumference of 78.54 x 0.8 high (average) x 1.2m wide. Acrotelm (turves) for upper 0.3m.
Turbine Foundations Assumed base of 25m diameter.	0.40	Acrotelm: 785 Catotelm: 475.9 Total: 1,260.9	Acrotelm: 157.08 Catotelm: 94.25 Total: 251.33	Avoidance was the first level of screening, to avoid areas of peat. Turbines are generally sited on shallow peat/peaty soils overlying glacial soils.	Only turbines sited on peat (>0.5 m) have been included within excavation calculations. At turbine foundations topsoil would be stripped keeping top 200 mm of turf intact. This would be stored adjacent to the base working area and would be limited to 1m height. Assumes base circumference of 78.54 x 0.8 high (average) x 1.2m wide. Acrotelm (turves) for upper 0.3m.
Hardstands (Permanent)	0.42	Acrotelm: 7,200 Catotelm: 4,140 Total: 11,340	Acrotelm: 243 Catotelm: n/a Total: 243	Crane hardstand locations have been influenced by the turbine design iteration to avoid peat and steep slopes. Orientation and location of crane hardstands have been designed to avoid peat so far as practicable.	Only hardstands sited on peat (>0.5 m) have been included within excavation calculations. Assumes restoration along 3 sides of hardstand - 3m wide batter x 1m high at highest end, grading down to ground level (0.3m average height). All acrotelm.

Infrastructure Location	Average Probe Depth (m)	Estimated Volume of Excavated Peat (m^3)	Estimated Volume of Potential Peat Reuse (m^3)	Hierarchy Adherence*	Assumptions
Hardstands (Temporary) - Blade Laydown and Ancillary Areas	0.38	Acrotelm: 2,061 Catotelm: 824.4 Total: 2,885.4	Acrotelm: 2,061 Catotelm: 824.4 Total: 2,885.4	Crane hardstand locations have been influenced by the turbine design iteration to avoid r peat and steep slopes. Orientation and location of crane hardstands have been designed to avoid peat.	Only hardstands sited on peat (>0.5 m) have been included within excavation calculations. Given temporary nature of blade laydown and ancillary areas, any material excavated would be stored locally and re-instated on completion.
Control Building and substation	0.4	Acrotelm: 2,560 Catotelm: 256 Total: 2,816	Acrotelm: 73.5 Catotelm: 49.0 Total: 122.5	Avoidance was the first level of screening, to avoid areas of peat.	Assumes restoration / landscaping around circumference (excluding track side) of compound. Acrotelm (turves) for upper 0.3m.
Temporary Batching Plant	0.47	Acrotelm: 1600 Catotelm: 280 Total: 1,880	Acrotelm: 1600 Catotelm: 280 Total: 1,880	Avoidance was the first level of screening, to avoid areas of peat.	Given temporary nature of Batching Plant, any material excavated would be stored locally and re-instated on completion.
Temporary Construction Compound	0.37	Acrotelm: 1,504.42 Catotelm: n/a Total: 1,504.42	Acrotelm: 1,504.42 Catotelm: n/a Total: 1,504.42	Avoidance was the first level of screening, to avoid areas of peat.	Given temporary nature of construction compound, any material excavated would be stored locally and re-instated on completion.

Infrastructure Location	Average Probe Depth (m)	Estimated Volume of Excavated Peat (m^3)	Estimated Volume of Potential Peat Reuse (m^3)	Hierarchy Adherence*	Assumptions
Borrow Pits					
BP1	0.3	Acrotelm: n/a Catotelm: n/a Total: 0	Acrotelm: 1,440 Catotelm: 1,440 Total: 2,880	Avoidance of peat - borrow pits were sited in locations avoiding thick peat, where bedrock is expected to be near surface. Each borrow pit would be designed following ground investigation (avoiding peat extraction), with dimensions reduced from the search area which is considered the maximum extent. For the purposes of this assessment, we have assumed a typical extraction footprint of 60 m x 60 m.	No peat anticipated to be extracted but peat soils are considered suitable for re-use (subject to review during detailed design stage following ground investigation). Assumes fill of 0.8 m. Maximum of 0.7m catotelm given likely high water content and low strength.
BP2	0.23	Acrotelm: n/a Catotelm: n/a Total: 0	Acrotelm: 1,440 Catotelm: 1,440 Total: 2,880	Avoidance of peat - borrow pits were sited in locations avoiding thick peat, where bedrock is expected to be near surface. Each borrow pit would be designed following ground investigation	No peat anticipated to be extracted but peat soils are considered suitable for re-use (subject to review during detailed design stage following ground investigation). Assumes fill of 0.8 m. Maximum of 0.7m catotelm given likely high water content and low strength.

Infrastructure Location	Average Probe Depth (m)	Estimated Volume of Excavated Peat (m^3)	Estimated Volume of Potential Peat Reuse (m^3)	Hierarchy Adherence*	Assumptions
				(avoiding peat extraction), with dimensions reduced from the search area which is considered the maximum extent. For the purposes of this assessment, we have assumed a typical extraction footprint of 60 m x 60 m.	
BP3	0.25	Acrotelm: n/a Catotelm: n/a Total: 0	Acrotelm: 1,440 Catotelm: 1,440 Total: 2,880	Avoidance of peat - borrow pits were sited in locations avoiding thick peat, where bedrock is expected to be near surface. Each borrow pit would be designed following ground investigation (avoiding peat extraction), with dimensions reduced from the search area which is considered the maximum extent. For the purposes of this assessment, we have assumed a typical	No peat anticipated to be extracted but peat soils are considered suitable for re-use (subject to review during detailed design stage following ground investigation). Assumes fill of 0.8 m. Maximum of 0.7m catotelm given likely high water content and low strength.

Infrastructure Location	Average Probe Depth (m)	Estimated Volume of Excavated Peat (m^3)	Estimated Volume of Potential Peat Reuse (m^3)	Hierarchy Adherence*	Assumptions
				extraction footprint of 60 m x 60 m.	
BP4	0.52	Acrotelm: 1,440 Catotelm: 432 Total: 1,872	Acrotelm: 1,440 Catotelm: 1,440 Total: 2,880	Avoidance of peat - borrow pits were sited in locations avoiding thick peat, where bedrock is expected to be near surface. Each borrow pit would be designed following ground investigation (avoiding peat extraction), with dimensions reduced from the search area which is considered the maximum extent. For the purposes of this assessment, we have assumed a typical extraction footprint of 60 m x 60 m.	Assumes fill of 0.8 m. Maximum of 0.7m catotelm given likely high water content and low strength.
BP5	0.35	Acrotelm: n/a Catotelm: n/a Total: 0	Acrotelm: 1,440 Catotelm: 1,440 Total: 2,880	Avoidance of peat - borrow pits were sited in locations avoiding thick peat, where bedrock is expected to be near surface. Each borrow pit would be designed following	No peat anticipated to be extracted but peat soils are considered suitable for re-use (subject to review during detailed design stage following ground investigation). Assumes fill of 0.8 m. Maximum of 0.7m catotelm given likely high water content and low strength.

Infrastructure Location	Average Probe Depth (m)	Estimated Volume of Excavated Peat (m^3)	Estimated Volume of Potential Peat Reuse (m^3)	Hierarchy Adherence*	Assumptions
				ground investigation (avoiding peat extraction), with dimensions reduced from the search area which is considered the maximum extent. For the purposes of this assessment, we have assumed a typical extraction footprint of 60 m x 60 m.	
TOTAL		Acrotelm: 30,439.7 Catotelm: 7,101.3 Total: 37,541	Acrotelm: 32,014.2 Catotelm: 11,886.1 Total: 43,900.8		

*As detailed in Section 3.2, in line with best practice guidance[1]

6.2.5 The majority of the soils excavated on site are expected to comprise mineral and peaty soils, with some acrotelmic peat. Catotelmic peat is not expected to be excavated in large quantities during construction of the Proposed Development. It is likely that acrotelmic peat excavated from previously afforested and felled areas is likely to be more degraded and mixed peat profile where peat has been overturned during ploughing.

6.2.6 The volumes calculated for reuse proposals represent the potential opportunities for reinstatement of excavated peat. Based on the values indicated, the opportunity for reuse exceeds the volume of material to be excavated, therefore there is a balance of materials expected with no surplus peat anticipated to be generated on site (i.e. no waste) – see Annex 2. There is no requirement to import donor peat onto the site for reinstatement of construction disturbed areas. Should further post-consent ground investigation information become available, the calculations would require revision.

7 Monitoring and Inspection

7.1.1 The construction phase of the development would be supported by a Geotechnical Engineer and ECoW/EnvCoW or other suitably qualified person. There would be frequent, routine, and regular inspections of peat in all stockpiles and temporary storage areas as part of the PMP audit process. Inspections would assess in situ peat physical conditions, integrity of containment and temporary drainage conditions, and they would seek to confirm that stockpile design and management was adequate to prevent erosion and peat slide. These inspections would take place weekly (at a minimum) during stockpile creation and storage.

7.1.2 Should any problems be observed during regular visual inspections of peat stockpiles, this would invoke implementation of an appropriate corrective action which would be recorded and monitored for effectiveness. Types of corrective actions would include, but would not necessarily be limited to:

- modification of temporary drainage;
- additional or modified bunding;
- incorporating of sediment fencing if required; and
- light re-grading to correct any areas of surface erosion, etc.

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

- Peat surface, peat profile and peat consistency conditions would be carried out as part of ground investigations prior to the start of construction. This information would provide detailed information on the baseline conditions for each part of the infrastructure footprint.
- Restored peat conditions would be inspected immediately after restoration to ensure that the methods detailed in the PMP had been correctly implemented and to inform any corrective actions should they be required.
- The physical condition of peat would be retained as carefully as possible both at the peat storage and the peat restoration stages. This is particularly important for vegetation establishment.
- Within 3 months of completion of works in any area, the ECoW/EnvCoW inspects the reinstatement efforts to determine satisfactory placement of sub-soil, topsoil and turves.
- The ECoW (or other qualified person) undertakes a final inspection of all reinstated areas at the end of the first growing season following completion of reinstatement.
- The ECoW/EnvCoW should complete a daily diary of onsite activities which would be compiled within a monthly ECoW report which will include information relating to peat reinstatement, these reports will be available at the request of the Planning Authority.

8 Conclusion

8.1.1 The Outline PMP has been developed in line with best practice guidance. The PMP addresses the following peat related issues:

- The depth of peaty soils/peat deposits at site;
- The volumes of peaty soils/peat that are predicted to be excavated and its suitability for reuse;
- The capacity to reuse the peat onsite; and
- Peat handling and temporary storage.

8.1.2 A series of good practice standards detailed within this report relating to excavation, handling and storage of peat should be utilised to maintain the structural integrity of excavated peat and its suitability for reuse.

8.1.3 It has been concluded that all the materials to be excavated on site would fall into the non-waste classification as all of the topsoil and peaty soils would be re-used on site. Based on the probing exercise and observations on site, the excavated materials are likely to comprise predominately organic topsoil and acrotelmic peat, with limited catotelmic deposits present. Thick peat deposits are limited across the site and have been avoided by design.

8.1.4 All excavated material is expected to be entirely reusable, with no surplus of peat (waste) anticipated. No import of donor peat is required to reinstate construction disturbed areas.

8.1.5 The figures detailed within this report are to be considered indicative at this stage. Post consent, the Outline PMP and Construction Environmental Management Plan (CEMP) will be updated with information gathered during detailed ground investigation.

Annex 1 – Drawings

Annex 2 – Excavated Materials Calculator