Appendix 6A
Peat Management Plan

RWE Renewables UK Onshore Wind Ltd

Enoch Hill II Wind Farm

Appendix 6A Outline Peat Management Plan

August 2023

Report for

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1	First Issue	April 2023
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Contents

1. Introduction

1.1 Background

RWE Renewables UK Onshore Wind Ltd ('the Applicant') is seeking to apply for planning permission under the Town and Country Planning (Scotland) Act 1997 (as amended) for the proposed Enoch Hill 2 Wind Farm ('the Proposed Development'). The Proposed Development occupies a land ('the Development Site') located in East Ayrshire approximately 6km to the south-west of New Cumnock and approximately 9km east of Dalmellington, just to the north of the border with Dumfries and Galloway. The Proposed Development would consist of 2 no. wind turbines plus associated crane pads, approximately 8 km of new or upgraded wind farm tracks, a battery storage facility, a temporary construction compound and an electrical control building / substation compound[1]. This Outline Peat Management Plan ('Outline PMP') quantifies the potential volume of peat that is expected to be excavated for the Proposed Development, identifies temporary storage requirements and potential uses of excavated peat for subsequent reinstatement / potential restoration. A range of control measures is proposed to ensure that the peat is protected as far as practically possible during excavation, transportation, temporary storage and subsequent reinstatement/ potential restoration. The Outline PMP also sets out a range of monitoring and inspection protocols.

It is expected that the final PMP would form part of an overarching Construction Environmental Management Plan ('CEMP'). To this end, it is expected that this Outline PMP would subsequently be updated as necessary following detailed design and be used by environmental managers and site contractors as the basis to control, record and audit environmental management activities relating to peat conditions and to ensure that peat remains in good condition for future re-use within the Development Site.

The methods set out in this Outline PMP have been developed in line with good practice including:

- Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste (Scottish Renewables *et al*., 2012).
- Good Practice During Wind Farm Construction (Scottish Renewables *et al*., 2019).
- Guidance on Developments on Peatland – Peatland Survey (Scottish Government *et al*., 2017).
- SEPA Regulatory Position Statement – Developments on Peat.
- Floating Roads on Peat (Forestry Civil Engineering and Scottish Natural Heritage, 2010).
- Developments on Peat and Off –Site Uses of Waste Peat (SEPA Guidance WST-G-052, 2017).
- Peatland Action: Peat depth and peat condition survey guidance and recording form guidance 2021-22 (NatureScot).

[1] Located within the temporary construction compound footprint once this is vacated.

1.2 Baseline Peat Resource

Site Overview

Published geological mapping of superficial soils indicates the Development Site is partially underlain by peat.

The Carbon and Peatland Map (Scottish Natural Heritage, 2016) identifies that the Development Site is in a Class 5 area, defined as "*carbon-rich soils and deep peat but with no peatland vegetation*".

For the purposes of this PMP, peat is sub-divided into three categories that form a continuum based upon peat depth as follows:

- **Peaty (Carbon-Rich) Soils** where the depth of the organic horizon is less than 0.5m;
- **Peat** where the depth of the organic horizon is between 0.5m and 1.00m; and
- **Deep Peat** where the depth of the organic horizon is greater than 1.00m deep. This accords with the definition in the Scottish Government's *Guidance on Developments on Peatland - Site Surveys*. The definition of deep peat in Scotland being more than 1m deep is also referenced in the JNCC Report No. 445: Towards an assessment of the state of UK peatlands (JNCC, 2011).

A full description of the vegetation within the Development Site is provided in the EIA Report **Chapter 11: Ecology**. In summary, the Development Site is dominated by coniferous plantation woodland with open areas and rides comprising a mix of blanket mire, rush pasture, acid flush and acid grassland plant communities.

There were no geomorphological features of note associated with the peatland within the Development Site (peat pipes, peat hags and gullies for example).

The natural morphology of the Development Site has been disturbed by forestry, with linear drainage clearly visible in forested areas.

Hierarchy of Peat Management

A hierarchy of peat management is provided in guidance issued by SEPA (2017):

- Prevention – prevent or minimise peat excavation/disturbance through considered design that avoids or minimises wind farm infrastructure within areas of peat. Where avoidance is not possible, minimise excavation of peat using engineering solutions such as floating roads.
- Re-Use– re-use extracted peat close to its original location in the reinstatement of temporary infrastructure, road verges and borrow pits. Peat may also be used where appropriate to improve or restore peatland habitats.
- Recycle/Recover/Treat – while the priority should always be to prevent and re-use peat on site there may be situations in which there may still be a surplus of excavated peat. Where demonstrated that it is suitable for use peat, may be blended, dewatered, or treated to improve its properties to support re-use on site.
- Temporary storage – store the peat temporarily during construction prior to re-use in on site reinstatement / restoration activities.
- Disposal - Disposal of peat, particularly catotelmic peat, can lead to a number of issues due to its very low tensile strength and high-water content. Where landfill on-site is identified as the preferred option for the disposal of waste peat it will be

necessary to obtain a Pollution Prevention and Control permit from SEPA prior to the commencement of any landfill operations on-site. In such cases the operator should contact their local SEPA office to discuss their proposals.

This hierarchy of peat management has been followed throughout the design of the Proposed Development and will continue during construction through micrositing, to prevent or minimise excavation of peat wherever possible. However, it is recognised that complete avoidance will not be possible.

This Outline PMP therefore quantifies the expected volumes based upon information collated to date, identifies suitable options for re-use of excavated peat and sets out a range of methods and control measures to ensure that peat resources are protected as far as possible during construction.

1.3 Topography

The primary influence of topography in relation to peat and built infrastructure is in controlling the direction and rate of water flow, and in terms of slope angle, acting as a fundamental control on peat stability. The 'main' part of the Development Site[2] is dominated by Strandlud Hill, with elevations ranging between approximately 370m and 531m above Ordnance Datum ('AOD'). The elevation generally declines from the south-west o to the north-east.

As detailed within **Chapter 3: Project Description** and **Chapter 13: Geology, Hydrology and Hydrogeology** the number of watercourse crossings has been minimised. Up to 6 culverts, comprising one new culvert and five upgrades as detailed in **Table 13.11** of **Chapter 13: Geology, Hydrology and Hydrogeology**, are required and works would seek to minimise potential effects taking account of topographic, hydrological and ecological attributes at each proposed crossing point.

1.4 Potential Impacts on Peat during Construction

Principal types of adverse effect on peat that could potentially occur due to the construction of the Proposed Development are:

- **Loss of structural integrity and peat strength**. This could result from a wide range of practices such as:
  - Removing the surface vegetation turf;
  - Excavation, handling and transporting peat (particularly wet, subsurface peat);
  - Trafficking of heavy plant and vehicles across areas consisting of peat and organic surface horizons and vegetation turf;
  - Laydown of materials (including excavated peat and mineral soil) on peat and peatland vegetation; and
  - During the reinstatement of pre-construction peatland and heathland habitats.
- **Erosion and gullying**. This is principally caused by the potential exposure of bare peat surfaces – primarily caused by water erosion, due to surface runoff after rainfall.
- **Contamination**. This is principally caused by potential leaks, spillages or inappropriate laydown of materials.

[2] This is the western part of the Development Site where turbines, battery storage and other wind farm infrastructure would be located. This main part of the site is linked to Afton Road to the east via an existing access track that runs through Pencloe Forest.

- **Peat slide**. This can result from activities such as 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.
- **Interruption of peat hydrology**. The principal cause of this is likely to be poorly planned and implemented construction activities, leading to changes in water flows resulting in a potential indirect adverse effect upon vegetation, notably blanket bog and/or flushes.

Section 3 of this Outline PMP sets out a range of control measures that are designed to prevent these effects from occurring.

2. Peat Balance

2.1 Excavated Peat

Various peat probing surveys have been undertaken to inform the design:

- A Phase 1 peat depth survey was undertaken in 2017, across a 100m x 100m grid as far as possible. However, due to dense forestry around Strandlud Hill, a reduced survey was undertaken targeting the accessible locations only.
- During a Phase 2 survey carried out in 2019, where peat was found to be >0.5m in the Phase 1 survey, the following scope of works was undertaken:
  - 1 no. probe at 50m intervals along all access roads;
  - 2 no. probes 10m perpendicular to either side of the track where the peat depth was >1.0m; and
  - Probes on a 25m grid at the turbine locations where peat was <1.0m reduced to a 10m grid where peat was >1.0m.
- A supplementary Phase 2 survey was carried out in February 2023 to cover the redesigned access track route on the main part of the site, the battery storage compound and an alternative construction compound location, in accordance with the following scope of works:
  - 1 no. probe at 50m intervals along all access tracks;
  - 1 no. probe 10m perpendicular to each side of the track only where peat depths were >0.5m; and
  - a star of transects at 10m intervals covering the micro-siting buffer.

Full details of the peat probing methodology are provided in the **Peat Slide Risk Assessment (Appendix 13B)**. The distribution of sample sites and peat depths are displayed in **Figure 2.1** and an interpolated peat depth map is provided as **Figure 2.2**.

Volumes of peat to be excavated have been calculated for this Outline PMP by determining the mean peat depth from all sample probes within each specific sector of access track or other infrastructure component and multiplying this by the surface area of the component.

The design of the Proposed Development has been informed by peat probing survey results. In particular, the proposed infrastructure has been located to avoid areas of deepest peat where possible and considering other constraints. This approach has helped to minimise the volume of peat that would need to be excavated to accommodate the Proposed Development.

Volumes of stripped and excavated peat have been calculated based upon the averages of measured peat depths at each location, combined with the expected footprint of infrastructure of the Proposed Development (see **Figures 2.1 and 2.2**).

Table 2.1 summarises the estimated volumes of peat and peaty soils that will need to be excavated, with a more detailed breakdown of the calculation for each element presented in **Appendix A** of this Outline PMP.

Table 2.1 Anticipated Peat Excavation Volumes

Infrastructure	Peaty soils (m^3)	Acrotelmic Peat (m^3)	Catotelmic Peat (m^3)	Volume (m^3)	Assumptions on the indicative area requiring excavation[3]
Turbine foundations (2 no)	459	0	0	459	17m diameter circular base excavation, typical foundation depth 3m and foundation batter angle 45°. Area of excavation 908m^2 at each turbine.
Crane pads (2 no)	83	653	253	989	Excavated area 1,350m^2 for each crane pad.
Auxiliary crane pads (2 no)	15	198	62	275	Excavated area 400m^2 for each auxiliary crane pad.
Blade laydown areas (2 no)	722	0	0	722	Excavated area 1,250m^2 for each blade working area.
Control building & substation compound	77	0	0	77	Excavated area 1,400m^2.
Battery storage compound	0	0	0	0	Excavated area 2,500m^2 (to be created on half of the temporary construction compound).
Temporary construction compound	619	0	0	619	Excavated area 5,000m^2.
New access tracks (cut)[4]	2,639	3,065	868	6,572	Length 1,941m x average excavation width 10m (total area 18,220m^2)[5].

[3] Temporary land take around proposed infrastructure is required to facilitate construction and the indicative areas affected are itemised by element in **Table 3.2** of EIA Report **Chapter 3 Project Description**. The areas affected will be used for construction plant for example and it is not expected that peat extraction will be required; these areas are therefore not considered in Table 2.1. Where necessary, it is expected that these construction facilitating temporary land-take areas will be reinstated with vegetation from areas of permanent land take, including peat turves where appropriate.

[4] Chapter 3, Table 3.2 of the EIA identifies that the Access Tracks (including turning heads, junctions, passing places, a staging area and cable trenches) will require approximately 4.97ha of permanent land take and 8.61ha of temporary land take. The equivalent area within the PMP is 5.16ha, being the area that is anticipated to require peat excavation.

[5] Whilst the average running width of access roads will be up to 6m, an average of 10m has been included to allow for excavation batters.

Infrastructure	Peaty soils (m^3)	Acrotelmic Peat (m^3)	Catotelmic Peat (m^3)	Volume (m^3)	Assumptions on the indicative area requiring excavation[3]
Upgraded access Tracks (cut)	3,623	1,754	573	5,950	5,511m x average excavation width 5m (total area 20,876m^2). Forestry roads to be upgraded and widened for wind farm traffic[4].
New access tracks (floating)	0	0	0	0	No new access tracks proposed where peat depth is greater than 1.0m.
Upgraded access Tracks (floating)	0	0	0	0	419m x average width 10m (total area 6,265m^2). Where peat depth is greater than 1.0m, roads will be floated requiring no excavation of peat.
Cable trenches	626	0	0	626	Length 1,800m Excavated area 6,212m x 1.2m (7,454m^2) alongside access tracks. Assumed Depth 1.0m.
TOTALS	**8,863**	**5,670**	**1,756**	**16,289**	

2.2 Potential Re-Uses of Peat

Potential reuses of peat at the Development Site have been identified, in accordance with accepted guidance, notably Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and Minimisation of Waste (Scottish Renewables *et al*. 2012) and Good Practice during Wind Farm Construction (Scottish Renewables *et al*. 2019). Proposed control measures are set out in **Section 3**.

The potential reuse options include the reinstatement of peat at the Development Site, which has the primary objective to create conditions that will promote the establishment of healthy plant communities and habitats that match those present prior to construction and tie into adjacent vegetation. A key aim of such reinstatement is also to stabilise the track verges and to prevent peat erosion.

Surplus of excavated peat, where suitable, would provide the opportunity for potential peatland restoration, whereby the surplus peat could be used to block drains and smooth ploughed ridges and furrows. This would assist in creating conditions that promote the restoration of peatland plant communities within areas that currently do not support such communities.

Table 2.2 outlines how excavated peat and peaty soils could be reused on-site, together with indicative volumes and associated assumptions. A more detailed breakdown of the calculation for each element is presented in **Appendix B** of this Outline PMP.

Table 2.2: Anticipated Volumes of Peat that can be reused onsite.

Re-use Options	Peaty soils (m^3)	Acrotelmic Peat (m^3)	Catotelmic Peat (m^3)	Volume (m^3)	Assumptions re size of reinstatement
Turbine foundations (2 no) reinstatement	449	0	0	449	The turbine bases will be reinstated apart from a 5m diameter circle including and around the turbine base. Peaty soils excavated for the foundations will be used to the previous depth.
Crane pads (2 no) reinstatement	14	113	44	171	The crane pads are to be reinstated at the edges of the pad not connected to the access track or other infrastructure using excavated peat/ peaty soils to the previous depth to achieve a good tie in to the surrounding vegetation. The width of the reinstatement will be between 3.0m and 4.0m, subject to local topography.
Auxiliary crane pads (2 no) reinstatement	4	48	14	66	The auxiliary crane pads are to be reinstated at the edges of the pad not connected to the access track or other infrastructure using peat/ peaty soils to the previous depth to achieve a good tie-in to the surrounding vegetation. The width of the reinstatement will be between 3.0m and 4.0m, subject to local topography.
Blade laydown areas (2 no) reinstatement	722	0	0	722	The blade working areas will be fully reinstated to the original peat profile
Control building and substation compound / reinstatement	18	0	0	18	A batter will be reinstated around three sides of the control compound/ substation using excavated peaty soils to the previous average depth to achieve a good tie-in to the surrounding vegetation. The width of the reinstatement will be between 3.0m and 4.0m, subject to local topography.
Battery storage compound reinstatement	61	0	0	61	A batter will be reinstated around three sides of the battery storage compound using excavated peaty soils to the previous average depth to achieve a good tie-in to the surrounding vegetation. The width of the reinstatement will be between 3.0m and 4.0m, subject to local topography.

Re-use Options	Peaty soils (m^3)	Acrotelmic Peat (m^3)	Catotelmic Peat (m^3)	Volume (m^3)	Assumptions re size of reinstatement
Construction compound reinstatement	300	0	0	300	Only half of the construction compound area (2,500m^2) will be available for reinstatement as the remaining half will house the battery storage compound. This area will be reinstated to the current average peat depth.
New access tracks (cut) reinstatement	2,740	1,839	0	4,579	Peaty and acrotelmic soils will be used to reinstate verges (up to 3m wide and 0.5m deep on either side of the new access road) following construction.
Upgraded access Tracks (cut) reinstatement	3,424	1,002	0	4,426	Peaty and acrotelmic soils will be used to reinstate one verge (up to 3m wide and 0.5m deep) following construction.
New access tracks (floating) reinstatement	0	0	0	0	No new access tracks proposed where peat depth is greater than 1.0m.
Upgraded access Tracks (floating) reinstatement	0	626	0	626	Acrotelmic peat to be used for reinstatement up to 0.5m deep subject to approval by the Environmental Clerk of Works ('ECoW').
Cable trenches	626	0	0	626	Cable trenches will be fully reinstated to the original peat profile.
Peatland restoration (using surplus peat)	505	2,041	1,697	4,243	The key-holed area around turbine 1 amounts to 5.8ha (excluding permanent infrastructure) and will not be re-planted with trees. This offers the option for potential peatland restoration whereby surplus excavated peat could be used to block drains and smooth ploughed ridges and furrows. Tree stumps could also be flipped into the drains to aid this process. Further details would be provided post consent, at detailed design stage.

Re-use Options	Peaty soils (m^3)	Acrotelmic Peat (m^3)	Catotelmic Peat (m^3)	Volume (m^3)	Assumptions re size of reinstatement
TOTALS	**8,863**	**5,670**	**1,756**	**16,289**	

Based upon current available information, it is anticipated that all excavated peat will be suitable for reuse at the Development Site, in accordance with the proposals set out in **Table 2.2**. Should this not be possible, the hierarchy of peat management will apply (see **Section 3** of this Outline PMP.

Table 2.1 indicates that the total volume of peat that will be stripped and excavated during the construction of the Proposed Development will be approximately 16,289m^3, all of which can be beneficially re-used for reinstatement or restoration), as summarised in **Table 2.2**.

No allowance has been included for peat shrinkage during temporary storage and the control measures outlined in Section 3 of this Outline PMP are designed to avoid this. However, in practice, it may not be possible to avoid shrinkage altogether. Should this occur, it is anticipated that the volume of peat would not significantly affect the re-use options set out in **Table 2.2**.

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257000 258000 259000 260000 261000 262000 263000

610000 609000 608000 607000 606000 605000

Key

- Site boundary
- Turbine location
- Primary and auxiliary crane pads (refer to figure 3.4 for crane pad layout)
- Blade laydown area
- Control building and substation compound
- Battery storage compound
- Temporary construction compound

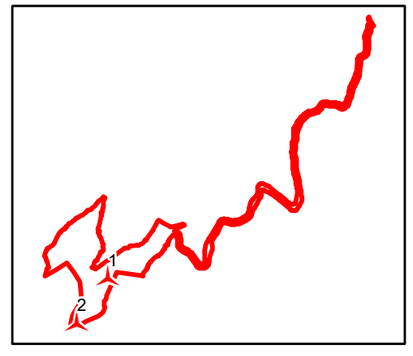
Access Track

- Onsite access tracks
- Pencloe Forest access route
- Layby for temporary turbine delivery storage

Peat Depth (m)

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

Minor infrastructure not shown due to scale



Client

RWE

Enoch Hill 2 Wind Farm
Peat Management Plan

Figure 2.1.1
Peat Depth Survey Results

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0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 km

Scale at A3: 1:20,000.

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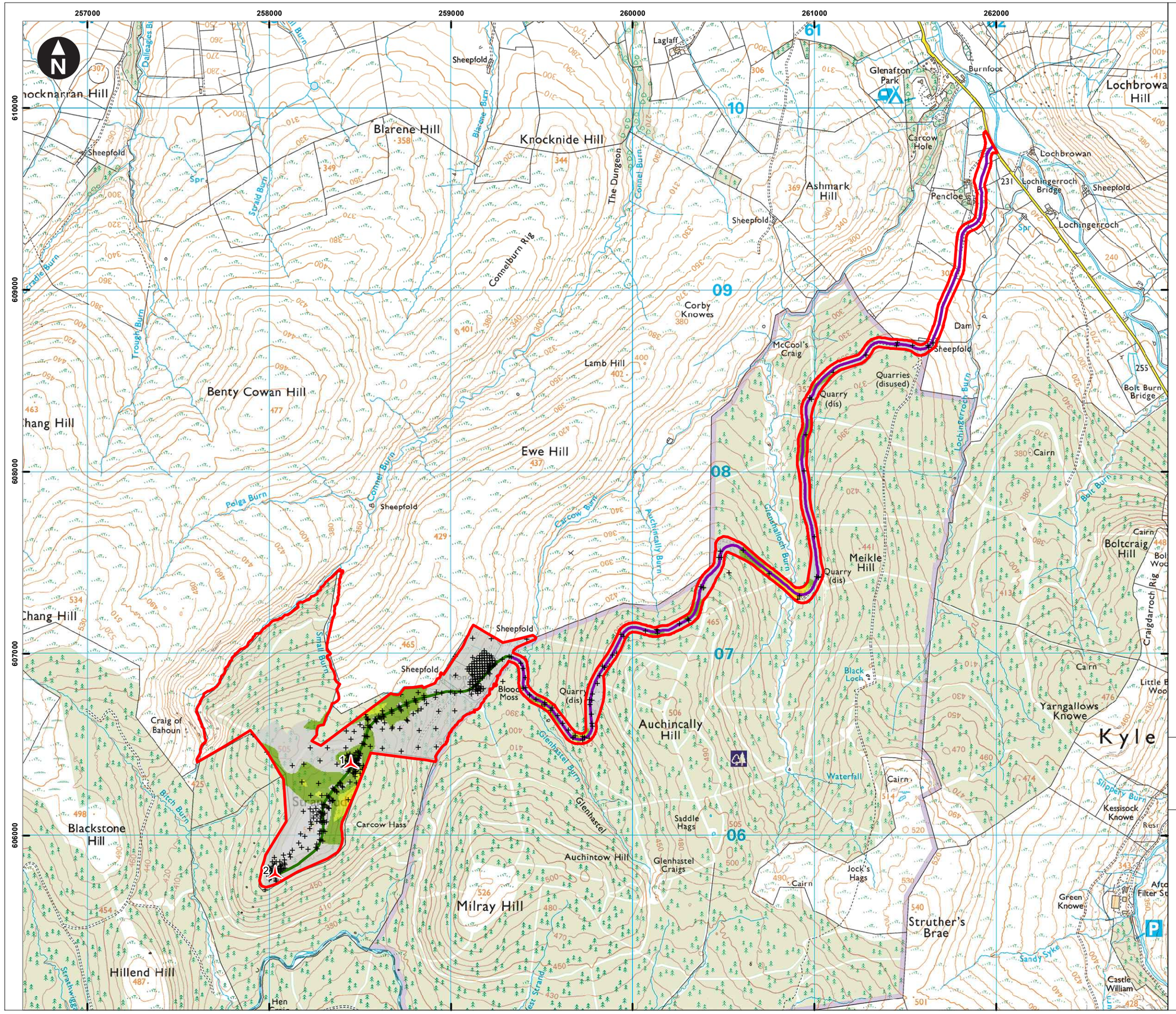

Key

- Site boundary
- Turbine location

Access Track

- Onsite access tracks
- Pencloe Forest access route

Interpolated Peat Depth (m)

- 0.0 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- \+ Peat survey points

Minor infrastructure not shown due to scale

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 Kilometers

Scale at A3: 1:20,000

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Enoch Hill 2 Wind Farm
Peat Management Plan

Figure 2.2
Interpolated Peat Depth

August 2023

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3. Peat Protection Measures

Where peat excavation is unavoidable, care must be taken when handling, transporting and stockpiling peat to protect the peat structure and strength as far as possible. The movement of peat over long distances will be minimised and peat will be stored locally for re-use as soon as possible. Double handling will be avoided or minimised, and a robust planning and monitoring programme will be developed to ensure that peat and mineral soils are not mixed.

3.1 Protection of In Situ Peat

The layout of the Proposed Development has already taken into account constraints relating to sensitive areas of deep peat, as part of the design process. Infrastructure of the Proposed Development will be marked on an Access Plan (to be developed post-consent), which will provide a designated controlled route and a permissible corridor within which service vehicles and plant can operate. The purpose of the Access Plan is to restrict construction activities to the areas required to protect in situ peat in areas that are not affected by the Proposed Development and to prevent unnecessary damage by vehicle and plant movements across these areas. The following rules will apply to the Access Plan:

- There will be no vehicle access to areas of the Development Site outwith the area marked on the Access Plan (i.e., the layout/working area marked on the plan).
- Servicing or refuelling activities will only take place within clearly designated areas within the Access Plan which have been identified in the CEMP.
- Laydown of materials (either construction materials or waste materials) will take place only within designated areas within the Access Plan. There will be no laydown, unless identified in the construction drawings, of any type of materials either within the access route corridors or anywhere outwith the designated areas. Laydown areas will be checked with the peat landslide risk assessment prior to their designation.

Access routes and working areas will be clearly delimited throughout the construction phase to ensure that peat compaction and damage in areas not directly involved in the works will be avoided. The construction works will be phased to ensure that peat is stripped in each part of the Site ahead of mineral subsoil.

3.2 Stripping and Excavation of Peat

Acrotelmic Peat

In all locations where there is an organic surface layer, the stripping and excavation method(s) to be used in each part of the Development Site will be agreed in advance as part of the CMS. Wherever possible, a 360° excavator will be used to permit stripping of large-scale surface peat turves, with their vegetation intact. Ideally these should be a minimum of 0.5m deep and with an area up to a maximum of $1m^2$. However, the depth and scale will depend on the depth, consistency, and condition of the surface peat at each location and the plant used for stripping. The general rule should be that the largest possible turf should be stripped, which allows it to remain intact.

The turves will be transferred intact, using for example, the bucket of the excavator, to their temporary storage location, where they will be stored, with vegetation upright. Geotextile will be

used where necessary (to be confirmed by the ECoW) to ensure that underlying vegetation and peat is protected as much as possible from the effects of temporary storage.

Catotelmic Peat

Where excavation of catotelmic peat is necessary it is more likely to have reduced structure (depending on its water content and fibrosity) and could be very wet. If possible, it should be transferred straightaway to a designated location for re-use. If not possible, a suitable temporary storage location will be identified in a location which minimises the distance of travel. Storage will be for as short as possible and control measures implemented to minimise damage to the peat (see "General Principles for Temporary Peat Storage").

During peat and soil stripping, handling and temporary stockpiling, all efforts will be made to prevent unnecessary trafficking over peat. Appropriate scale plant will be used, such as 360^0 excavators rather than bulldozers. Double handling will be avoided as much as possible, and a robust planning and monitoring programme will be invoked by the ECoW and Site Environmental Manager to ensure that peat and mineral soil are not mixed.

To ensure a minimum amount of damage to peat during stripping activities, strict procedures will be adopted for heavy plant access, stripping and handling/transport of surface, intact, peaty turf and subsurface wetter peat. Antecedent moisture conditions are critical for this and peat stripping and handling will not take place if there are heavy rainfall conditions which exceed those specified for cessation of works (see below).

Where mineral soil is encountered, soil stripping and excavation will generally follow the methodologies recommended for mineral soil by Ministry of Agriculture Fisheries and Food (2000) and the Department for Environment Food and Rural Affairs (2009).

3.3 General Principles for Temporary Peat Storage

Separate stockpiles will be created for peat (including peaty soils) and mineral soil. Documentation and physical control measures will be set in place to prevent accidental mixing and to ensure that peat and mineral soils are appropriately segregated. The principal aim will be to keep peat in a suitable condition for reuse by minimising problems of erosion, soil compaction, dewatering and instability.

The selection of temporary peat storage locations will consider the environmental constraints including peat landslide risk, avoidance of sensitive peatland habitats and avoidance of water features.

The number and locations of temporary peat storage areas will be identified ahead of construction (and will be detailed in the CMS) to minimise the distance that stripped and excavated peat would have to be transported both at the time of excavation and at the time of replacement/ restoration.

Each storage location must be approved by the site ECoW, taking into account each location's suitability in terms of its proximity to the source of peat, environmental impact, safety, constructability and whether special mitigation measures will be required.

Acrotelmic peat stockpiles will generally be to a depth of no more than 1m. However, where the condition of the peat is suitable and, where approved by the ECoW (who must be a suitably experienced peat specialist), peat may be stored to a maximum height of 2m. This would have the advantage of reducing the footprint area of peat storage and the surface area exposed to sunlight and drying.

The ECoW will determine, on a case-by-case basis, whether any drainage control measures need to be applied (e.g. settling ponds, drainage ditches, check dams etc) and whether a bund should

be constructed around the perimeter of the peat storage area(s). If so, the bunds will extend to a minimum level of above the toe of the stockpiled peat to restrain surface runoff.

A summary of the stockpiling method for a low water content catotelmic peat is provided below:

- Step 1 – The peat will be loose tipped in heaps to a maximum height of 2m starting at the furthest point in the storage area and working back toward the access point. To avoid compaction, no machinery (even tracked plant) will traverse the stockpile.
- Step 2 – The surface of the stockpile will be lightly tamped and smoothed off with the bucket of an excavator to reduce rainwater infiltration.

Where catotelmic peat is very wet, this will be stored in a purpose-built bunded location with the final peat depth no greater than 1m. Each bunded storage area will be designed with a settling pond to collect run-off and infiltrated rainwater and enable sediment retention. Each settling pond will be designed with appropriate filtration treatment facilities prior to connection into the surface water drainage scheme for The Development. It will also be regularly inspected and maintained with peat sediment returned to the stockpile as necessary. If significant erosion of the storage area is observed, it should be covered to protect it from further erosion by heavy rainfall and frost during the winter months.

Table 3.1 sets out criteria for the selection of suitable temporary peat storage areas.

Table 3.1 Temporary peat storage criteria

Suitability	Criteria
High (most favoured locations for peat storage)	Less than 75m from proposed infrastructure (to minimise extent of construction envelope). More than 50m from watercourses. More than 25m from active ditches or gullies. Avoids active blanket bog vegetation ((to be determined by the ECoW, in consultation with a suitably experienced peatland ecologist where necessary) Located and constructed so that erosion and runoff is limited, leachate from the material is controlled, and stability of the existing peatland in the vicinity is not affected. Located on peat that is less than 1.0m deep. Located in an area with negligible or low peat landslide risk Avoids groundwater dependent terrestrial ecosystems ('GWDTEs').
Moderate	Defined in the same way as High but GWDTEs are present.
Low (least favoured locations for peat storage)	Areas which do not meet one or more of the defined criteria (excluding the presence of GWDTEs)

The Principal Contractor will develop a programme of works to identify the specific locations and estimate the volume of peat that will require temporary storage at any one time. Prior to use, proposed temporary peat storage locations must be checked and approved by the ECoW (in consultation with a suitably experienced peatland ecologist where necessary.

Stockpiles will be designed to include measures that avoid instability of the stockpiles and the run-off of peat laden sediment into watercourses.

Measures to manage and treat Site run-off and prevent erosion during peat stripping and stockpiling works will be set in place through a series of specific control measures relating to surface water management which may include specifically orientating the stockpile, levelling/benching, bunding to contain stored materials and site-specific drainage to ensure that

runoff waters are sufficiently controlled (refer to the Drainage Management Strategy which is expected to form part of the CEMP).

3.4 Stockpile Monitoring

There will be frequent, routine, and regular inspections of peat in all stockpiles and temporary storage areas as part of the PMP audit process by the ECoW (see Section 4). The inspections will assess *in situ* peat physical conditions, integrity of containment, temporary drainage conditions and confirm that stockpile design and management is adequate to prevent erosion and peat landslide. It is recommended that these inspections take place weekly during the stockpile creation and throughout the storage duration, as well as following any large rainfall events. The inspection should follow the list of inspection criteria in **Table 5.1** as a minimum.

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

- Modification of temporary drainage.
- Additional or modified bunding.
- Incorporating of sediment fencing if required.
- Light re-grading to correct any areas of surface erosion.
- Where necessary covering with geotextile (that does not prevent rainwater infiltration).

3.5 Peat Reinstatement Methods

The characteristics of the excavated peat (e.g., fibrosity and water content) determines its suitability for re-use with the wettest most amorphous peat generally being the least suitable.

For the purpose of this PMP it has been assumed that the top 0.5m will be acrotelmic peat consisting of fibrous and pseudo-fibrous peat and the surface vegetation.

The following assumptions have been made with regard to the characteristics of the peat and the intended suitable reuses:

- Acrotelmic peat / peaty soils – when stripped with the vegetation, intact turves of acrotelmic peat or peaty soils will be suitable for surface reinstatement, dressing back and tying in infrastructure to the surrounding vegetation and habitats.
- Fibrous catotelmic peat – most suitable for reinstatement beneath the replaced acrotelm. Subject to suitability (to be assessed by the ECoW in consultation with a suitably experienced peat specialist if necessary) it may also be used as a surface layer with careful site selection and management to control erosion and encourage vegetation recovery (e.g., seeding, translocation of vegetation and fencing to deter deer grazing).
- Amorphous peat – peat of this type will only be suitable for reinstatement beneath a surface vegetation layer. However, the volume of amorphous peat that will require removal is anticipated to be small given that infrastructure has avoided the need to excavate deep peat where possible.

It is anticipated that all excavated peat that has been stored correctly should be suitable for reuse.

The primary objective of peat reinstatement is to create conditions alongside, around and within The Proposed Development that will enable the re-establishment of habitats that tie into adjacent

undisturbed habitats. A key aim of such reinstatement is also to stabilise the track verges and crane pad batters to prevent peat erosion.

The peat reinstatement process will involve two main stages to recreate the peat profile within the reinstatement areas. The first stage (where peat is to be greater than 0.5m deep) involves the spreading of catotelmic peat, and the second stage involves the replacement of peat turves on top to create conditions that will allow the reinstatement of peatland vegetation. During peat reinstatement the following fundamental measures would be taken to preserve peat quality and to ensure the speediest re-establishment of appropriate vegetation:

- Replace, spread out and lightly tamp down the peat in layers in the following order: catotelmic peat first and replaced peat turves second, either to the depth of peat recorded prior to construction, or to the pre-determined depth of peat prescribed in the PMP.
- In all reinstatement activities, avoid over compaction and any unnecessary damage to peat turves.
- Regularly water the replaced turves if reinstatement activities take place in dry summer conditions.

In order to ensure that the minimum amount of peat compaction occurs during placement when heavy machinery is used, the Contractor will develop a method for tipping and spreading of catotelmic peat in each compartment. This may include working progressively backward from the furthest point to the track/hardstanding to minimise tracking as well as spreading and very light tamping down by use of the bucket on a long reach excavator.

Peat handling and placement during reinstatement activities should be scheduled to take place as soon as possible to limit time in storage.

During habitat reinstatement works, mitigation is required to reduce some inevitable damage to peat and peat turves caused by handling and removal of peat from temporary stockpiles, transport and peat placement and re-grading on previously stripped areas. Mitigation measures during this phase of work would closely follow those used during the initial peat stripping phase of work, particularly methods to prevent peat compaction by heavy plant, erosion or peat landslide. This would include, but not be limited to, the implementation of an access and egress plan for vehicles and plant to prevent unnecessary trafficking of reinstated areas, use of appropriate scale, low bearing, plant, such as 360º excavators rather than bulldozers, forward planning to minimise double handling of peat and avoidance of mixing peat with mineral soil.

During reinstatement works, measures to manage and treat run-off, and prevent soil erosion during the works will also be set in place through a series of specific drainage control measures set out in the CEMP. In addition, where the vegetation will need to be given time to re-establish it may be necessary to temporarily fence parts of the reinstated areas to prevent damage by grazing livestock. The ECoW will monitor the re-establishment of peat forming vegetation and, where problems have been caused by inappropriate or incorrect peat storage, the Principal Contractor may need to carry out seeding and/or translocation of vegetation to achieve the appropriate revegetation.

4. Roles and Responsibilities

The implementation of the PMP will require certain key responsibilities to be assigned to defined roles. The PMP will form part of the CEMP and the hierarchy of roles and responsibilities illustrated in that document will also be appropriate for the PMP.

The Principal Contractor will be responsible for ensuring that a named individual has responsibility to supervise and provide quality control on peat stripping, stockpiling and restoration aspects of work. This individual will also have ultimate responsibility to ensure that all peat management and monitoring obligations are met and that the control measures described in this PMP are correctly implemented.

The ECoW (If necessary, in consultation with a suitably experienced peat specialist) will be responsible for carrying out peat inspections of temporary storage/stockpiling areas and peat conditions in restored areas.

Roles and responsibilities in relation to the PMP are summarised in **Table 4.1**.

Table 4.1 Summary of PMP roles and responsibilities

Role	Responsibility
Principal Contractor	Appointment of a named individual to: • Oversee the implementation of the PMP, checking that prescribed methodologies are being correctly implemented. • Provide overall quality control on peat management. • Ensure that all peat management and monitoring obligations are met. • Work with the ECoW to ensure joined up thinking and implementation between the proposed mitigation in the EIA Report, and environmental management plans including both the construction and operational drainage schemes.
ECoW	Carries out regular inspection of: • peat stripping (checking that peat and mineral soil are not being mixed). • peat handling. • methods of peat storage/stockpiling. • conditions of peat in temporary storage/stockpiling areas. • peat restoration activities and conditions. Works with the Principal Contractor's named individual with responsibility for peat management to ensure joined up thinking and implementation between the proposed mitigation in the EIA Report, and environmental management plans including both the construction and operational drainage schemes. Reports any non-compliances to the Principal Contractor's named individual with responsibility for peat management.

5. Monitoring and Inspection

Neither physical sampling nor chemical analysis of peat conditions are prescribed. However, water quality monitoring and regular inspections of restored vegetation conditions and runoff water conditions are expected to be carried out throughout the construction and restoration phases of work. These will act as surrogates for peat monitoring – since both depend heavily on correct peat management, particularly correct temporary storage, and restoration.

The ECoW will carry out:

- Regular inspections of peat surface, peat profile and peat consistency conditions;
- Runoff water quality conditions; and
- Vegetation restoration.

Temporary peat stockpiles and storage of peat turves will be inspected weekly according to the checklist set out in **Table 5.1**.

Table 5.1 Checklist for checking peat stockpiles and storage of turves

No	Criteria to check
1	Any locations where stockpiles have been constructed to higher than the threshold 2m elevation.
2	Any locations where boundaries between segregated peat and mineral soil stockpiles have become amalgamated, causing contamination of peat with mineral soil.
3	Any signs of surface peat erosion – caused by surface water runoff, frost or wind. Any locations of surface water ponding, indicating that stockpile is not shedding water correctly.
4	Any signs of inappropriate vehicle tracking, indicating inappropriate access and trafficking, causing additional unnecessary compaction.

If any non-compliances are found, corrective actions will be invoked as noted below:

- Restored peat conditions will be inspected immediately after restoration to ensure that the methods outlined in this PMP have been correctly implemented and to inform any corrective actions should they be required.
- Peat physical conditions must be retained as carefully as possible both at the peat storage and peat reinstatement stages. This is particularly important for vegetation establishment.
- Visual inspections of restored areas will record any locations where any of the following conditions occur after reinstatement, in order to formulate remedial actions.
    - Bare peat surfaces without peat turf which require stabilisation and re-seeding.
    - Any areas of eroding peat turf, for example where replacement of turf on a gradient has occurred and stabilisation is required.
    - Any areas of ponded water where temporary or permanent adjustment/re-design of the surface water drainage system is required.

5.1 Corrective Actions

Should there be any incidences where inspections of peat storage areas or reinstated peat areas identify any issues, corrective actions will be invoked. This procedure is particularly important at the storage/stockpiling stage to ensure that there is no risk of peat landslide or peat erosion and in the final phase of works, once reinstatement activities are completed, to ensure that any non-compliances are corrected before re-vegetation activities take place.

Should any non-compliances be identified, they will be reported via the PMP Audit procedure.

5.2 PMP Audit Procedure

An auditing process is required to ensure that the correct checks and inspections are carried out and that non-compliances are identified, reported, and rectified, with measures put in place to prevent future occurrences. In addition, it ensures that the required inspections are carried out, correctly interpreted, reported, and acted upon as required.

The auditing process for recording peat conditions in storage/ stockpile areas will form part of the overall construction documentation procedure. The PMP auditing process will include documentation, incident reporting and a procedure for implementing corrective actions. It will also describe any required review procedures.

Peat Stripping and Stockpiling Documentation and Plans

The documentation and database to be used to log and chronicle the origin, handling, transport, storage/stockpiling, inspections and final peat reuse will be developed in detail by the Contractor prior to the start of construction. The written procedure for peat stripping and storage/stockpiling will form part of the Construction Method Statement.

As construction activities proceed, the PMP will indicate locations and quality of *in situ* peat and peaty soils: particularly the depth of peat, together with schedules of actual volumes of peat stripped and expected after-use. Documentation will identify the person(s) responsible for supervising and overseeing peat management during the works.

An indicative Audit checklist is provided in **Table 5.2**.

Table 5.2 Indicative Audit Checklist

Element	Indicative Checklist
Access Plan/ Trafficking	Inspect to ensure that the Access Plan is being adhered to and that there is no trafficking, stopping of vehicles or refuelling of vehicles or plant outside of permitted areas marked on the Access Plan. Inspect to ensure that there is no laydown of any materials outside of permitted areas on the Access Plan. Ensure that no plant traffics across any area of virgin peat and issue non-compliances where this occurs. Advise on restoration of any trafficked and/or damaged area.
Peat Stripping Method	Ensure that correct peat turf depth is being adhered to when stripped – to ensure that peat structure and strength is maintained.

Element	Indicative Checklist
	Ensure that correct methods for excavation and transport of 'loose' peat are being adhered to.
Peat Storage/ Stockpiling	Inspect peat turf storage areas for each element of infrastructure and ensure that correct storage is being adhered to. Advise on whether watering of turves is required. Inspect storage of 'loose' peat and carry out checklist in Table 5.1. Advise on any corrective actions on storage/stockpiles.
Peat Reinstatement/ Restoration	Inspect replacement of 'loose' peat and peat turves and advise on any necessary corrective actions (e.g., methods for prevention of erosion). Advise on whether watering of turves after replacement is required.

This should be used to ensure that weekly inspections and checks are implemented and recorded in a timely manner and that monthly status reports are prepared on schedule.

5.3 Reporting of Non-compliances

Non-compliances will be reported as soon as they are identified by programmed inspections. They will be reported via the PMP Auditing procedure to the Principal Contractor's named individual (see **Table 4.1**) and corrective actions will be identified and implemented promptly. This will require timely decision making. If further inspections are required to ensure that acceptability criteria have been achieved, this will be prescribed and implemented. To facilitate speedy rectification of any non-compliances, the Principal Contractor's named individual will be responsible for day-to-day decisions on routine non-compliance issues.

5.4 Criteria for Cessation of Works

Experience has shown that the combination of wet weather and wet peat conditions create very difficult conditions for vehicle and plant operations and elevate the possibility of peatslide and peat erosion, leading, for example, to impaired water quality. For this reason, appropriate weather criteria are prescribed in this section to provide thresholds beyond which peat stripping, handling and stockpiling activities will cease.

If sustained heavy rainfall, or flash flooding, occurs during soil/peat stripping operations, work must be suspended and not restarted until the ground has at least one full dry day to recover.

If sustained snowfall and freezing conditions occur, soil/peat stripping and/or stockpiling, and/or restoration activities will cease. When thawing conditions occur, the Principal Contractor will use forecast meteorological conditions to determine the appropriate timescale for restarting any peat management activities (stripping, handling, storage, restoration). The decision-making will pay due attention to the potential for rapid and turbulent snowmelt runoff, peat erosion and peatslide risk.

5.5 Toolbox Talks

Regular toolbox talks will be used to ensure that all staff are aware of the PMP and applicable peat handling and protection procedures. The toolbox talks will be site-specific, discussing peat conditions at The Development.

An indicative list of possible toolbox talks is provided in **Table 5.3**.

Table 5.3 Indicative Toolbox Talks

Topic	Contents
Peat Protection	Why peat resources need to be protected. Site restrictions and good practice activities in order to protect peat resources.
Planning	Importance of planning peat management for example access and egress routes, temporary peat storage locations.
Peat Stripping	Why segregation of peat and mineral soils is important.
Peat Reinstatement	Process for ensuring that the integrity of reinstated/ restored peat is maintained.

6. References

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SEPA Guidance WST-G-052 (May 2017) Developments on Peat and Off-Site Uses of Waste Peat. wst-g-052-developments-on-peat-and-off-site-uses-of-waste-peat.pdf (sepa.org.uk)

Appendix A
Excavated Peat

WTG Foundations								
WTG_ID	Area (m^2)	MIN	MAX	Mean depth (m)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
T1	908	0.20	0.60	0.36	328	0	0	328
T2	908	0.05	0.33	0.14	131	0	0	131
	1,816			**TOTALS**	**459**	**0**	**0**	**459**

WTG Primary Crane Pads								
WTG ID	Area (m^2)	MIN	MAX	Mean depth (m)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
T1	1,350	0.25	1.10	0.69	0	653	253	906
T2	1,350	0.00	0.15	0.06	83	0	0	83
	2,700			**TOTALS**	**83**	**653**	**253**	**989**

WTG Auxiliary Crane Pads								
WTG ID	Area (m^2)	MIN	MAX	Mean depth (m)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
T1	400	0.59	0.74	0.66	0	198	62	260
T2	400	0.02	0.07	0.04	15	0	0	15
	800			**TOTALS**	**15**	**198**	**62**	**275**

WTG Blade Laydown Area								
WTG ID	Area (m^2)	MIN	MAX	Mean depth (m)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
T1	1,250	0.25	0.70	0.48	597	0	0	597
T2	1,250	0.04	0.20	0.10	125	0	0	125
	2,500			**TOTALS**	**722**	**0**	**0**	**722**

Control Building Compound								
ID	Area (m^2)	MIN	MAX	Mean depth (m)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
Substation	1,400	0.00	0.15	0.06	77	0	0	77
	1,400			**TOTALS**	**77**	**0**	**0**	**77**

Battery Storage Compound								
ID	Area (m^2)	MIN	MAX	Mean depth (m)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
Battery Storage Compound	2,500	0.01	0.89	0.14	0	0	0	0
	2,500			**TOTALS**	**0**	**0**	**0**	**0**

Temporary Construction Compound								
ID	Area (m^2)	MIN	MAX	Mean depth (m)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
Construction Compound	5,000	0.01	0.89	0.12	619	0	0	619
	5,000			**TOTALS**	**619**	**0**	**0**	**619**

Cut Access Tracks - New						
Length (m)	Width (m)	Area (m^2)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
1,941	10	18,220	2,639	3,065	868	6,572
1,941		**18,220**	**2,639**	**3,065**	**868**	**6,572**

Cut Access Tracks - Upgraded						
Length (m)	Width (m)	Area (m^2)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
5,511	5	20,876	3,623	1,754	573	5,950
5,511		**20,876**	**3,623**	**1,754**	**573**	**5,950**

Floating Access Tracks (Peat >1m deep) - Upgraded						
Length (m)	Width (m)	Area (m^2)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
418	5	6,265	0	0	0	0

Cable trenches						
Length	Area (m^2)	Mean Depth (m)	Peaty Soils	Acrotelm	Catotelm	Volume (m^3)
1,800	2,160	0.29	626	0	0	626

Appendix B
Peat Reinstatement

WTG Foundations								
WTG_ID	Area (m^2)	MIN	MAX	Mean depth (m)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
T1	888	0.20	0.60	0.36	321	0	0	321
T2	888	0.05	0.33	0.14	128	0	0	128
	1,777			**TOTALS**	**449**	**0**	**0**	**449**

WTG Primary Crane Pads								
WTG ID	Area (m^2)	MIN	MAX	Mean depth (m)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
T1	225	0.25	1.10	0.69	0	113	44	156
T2	225	0.00	0.15	0.06	14	0	0	14
	450			**TOTALS**	**14**	**113**	**44**	**171**

WTG Auxiliary Crane Pads								
WTG ID	Area (m^2)	MIN	MAX	Mean depth (m)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
T1	96	0.59	0.74	0.66	0	48	14	62
T2	96	0.02	0.07	0.04	4	0	0	4
	192			**TOTALS**	**4**	**48**	**14**	**66**

WTG Blade Laydown Area								
WTG ID	Area (m^2)	MIN	MAX	Mean depth (m)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
T1	1,250	0.25	0.70	0.48	597	0	0	597
T2	1,250	0.04	0.20	0.10	125	0	0	125
	2,500			**TOTALS**	**722**	**0**	**0**	**722**

Control Building Compound								
ID	Area (m^2)	MIN	MAX	Mean depth (m)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
Substation	330	0.00	0.15	0.06	18	0	0	18
	330			**TOTALS**	**18**	**0**	**0**	**18**

Battery Storage Compound								
ID	Area (m^2)	MIN	MAX	Mean depth (m)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
Battery Storage Compound	450	0.01	0.89	0.14	61	0	0	61
	450			**TOTALS**	**61**	**0**	**0**	**61**

Temporary Construction Compound								
ID	Area (m^2)	MIN	MAX	Mean depth (m)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
Construction Compound	2,500	0.01	0.89	0.12	300	0	0	300
	2,500			**TOTALS**	**300**	**0**	**0**	**300**

Reinstatement of verges on new cut access tracks (up to 3m wide verges on both sides of track, max depth 0.5m)						
Length (m)	Width (m)	Area (m^2)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
1,941	6	10,932	2,740	1,839	0	4,579
			2,740	**1,839**	**0**	**4,579**

Reinstatement of verges on upgraded cut access tracks (up to 2.5m wide verge on one side of track, max depth 0.5m)						
Length (m)	Width (m)	Area (m^2)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
5,511	2.5	10,438	3,424	1,002	0	4,426
			3,424	**1,002**	**0**	**4,426**

Reinstatement of verges on upgraded floated access tracks (up to 3m wide verge on one side of track, max depth 0.5m)						
Length (m)	Width (m)	Area (m^2)	Peaty Soils (m^3)	Acrotelm (m^3)	Catotelm (m^3)	Volume (m^3)
418	2.5	1,253	0	626	0	626
			0	**626**	**0**	**626**

Cable trenches						
Length	Area (m^2)	Mean Depth (m)	Peaty Soils	Acrotelm	Catotelm	Mean Peat Volume (m^3)
1,800	2,160	0.29	626	0	0	626

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