Appendix 7.1: Outline Peat Management Plan

Monan Repower

Client: Constantine Wind Energy (UK) Ltd
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1 Introduction

1.1 Overview

This report details the requirements for an outline Peat Management Plan (PMP) at the proposed Monan Repower Site. This document provides supporting information to the Environmental Impact Assessment (EIA) for the Proposed Development. This is an outline PMP that will be updated to incorporate any further site investigations and will be finalised after conditions discharge, should the project gain consent.

It provides details of the predicted volumes of peat that will be excavated on the Site, the characteristics of the peat that will be excavated, and outlines suitable methods for reusing and managing excavated peat in line with good practice methods.

This strategy should be adopted to allow the peat on Site to be managed in a sustainable manner, minimising excavation via the adoption of appropriate construction methods. Targeted reuse of peat as part of the reinstatement works shall also be a key consideration.

The following sections of this report provide:

- A description of the peat conditions on Site;
- Detail of the construction activities that will generate peat, and of the estimated volumes that will be generated, as well as the estimated reuse volumes;
- Detail of the physical nature of the peat and confirmation of its suitability for the reuses proposed;
- Methods and procedures for handling excavated soils; and
- Details of temporary storage.

This document should be read in conjunction with the information provided as part of the EIAR, including Chapter 7 - Hydrology

This document should be considered a **live** document throughout the development phase of the wind farm. As such, additional information may be incorporated following the results of any further investigations carried out as part of the detailed design process that provide further information across infrastructure locations. Additional information may also be incorporated from discussions with NatureScot, the Scottish Environment Protection Agency (SEPA), the Local Planning Authority, or other stakeholders. Such information should be used to refine the peat excavation and re-use volumes provided in this plan.

1.2 Guidance

This document addresses the following requirements in line with the SEPA Regulatory Position Statement – Developments on Peatland:

- Prevention – the best management option for waste peat is to prevent its production; and
- Re-use – developers should attempt to re-use as much of the peat produced on Site as possible.

This PMP has been produced in accordance with the following guidance on developing on peatland:

- Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, online version only;
- SEPA, Scottish Renewables (2012) Developments on Peatland: Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste;
- SEPA (2017) WST-G-052, version 1, Developments on Peat and Off-Site Uses of Waste Peat;

- Scottish Renewables, SNH, SEPA, Forestry Commission Scotland (2019) Good Practice During Wind Farm Construction 4th Edition; and
- Forestry Civil Engineering, SNH (2010) Floating Roads on Peat.

1.3 Limitations

This document has been prepared by Green Cat Renewables with all environmental, planning, and technical skill and expertise for the purposes of assessing the peat extraction and reuse volumes at the proposed Monan Repower Site.

The peat extraction and reuse volumes are provided as predictive indications and are based on a series of assumptions. Peat depth surveys should not be considered fully comprehensive as peat is naturally occurring material with natural variations, therefore its composition and depth can vary between peat probing locations. As such, the peat depth can still vary over a small scale which can impact on the total accuracy of the volume calculation. It is considered that this information gap does not significantly affect the broader assessment of the peatland value of the Site.

Whilst information gaps have been identified, the gathered data is considered to be sufficient for identifying a robust PMP that details the estimated peat volumes and proposed management for any excavated peat.

Further, the recommendations of this report are based on an interpretation of legislation, Codes of Practice, guidance notes, and current research opinion. Such guidance, particularly in environmental matters, is developing rapidly. Although this report endeavours to anticipate any such changes that may arise within the foreseeable future, changes are liable to occur which may cause the report inadequately to address the position at that time. Further, the situation may be subject to varied interpretation by statutory authorities and others, for which Green Cat Renewables Limited cannot be responsible.

Further ground investigation techniques will be employed, as necessary, prior to and during the construction phase in order to update the PMP and inform micro-siting. This will be carried out as part of the planning condition discharge, should the project gain consent.

2 Site Context

2.1 Overview

The development Site is located on and around the eastern flanks of Cnoc Leathan (250m AOD), approximately 0.8km to the north-east of the Hamlet of Bun Abhainn Eadarra on North Harris, Outer Hebrides. The Proposed Development is comprised of three turbines, which will be erected to replace the operational turbines within Monan Wind Farm as a proposed repowering project.

The Site and the wider setting is predominantly comprised of blanket bog and shrub heathland habitats that are intercepted by rocky outcrops and various lochs. The Site also has a history of human activities, with the operational Ceann an Ora Quarry located directly to the west of the site entrance, and the presence of the existing turbines at Monan Wind Farm. The A859 passes through the south-eastern section of the study area, connecting the various rural settlements from Stornoway to Rodel.

The terrain within the Site and surrounding area ranges from an elevation of approximately 3-390m AOD. The topography features several raised peaks, including: the northern flanks of Sgaoth Iosal (531m AOD) and the Tarsabhal (376m AOD), which then descend to the south-west to meet the coastline at Loch Bun Abhainn Eadarra.

There are several water features on the Site, including the Abhainn Thorabraidh, Abhainn Glaic a Choin duinn, Loch a' Mhorghain, Loch Sgeireagan Beag, and Loch na Sgeireagan Mor. All these watercourses on Site ultimately drain into the Loch Bun Abhainn Eadarra and form part of Lewis and Harris Coastal catchment of the Scotland River Basin District.

NatureScot have produced a consolidated spatial dataset of areas of carbon-rich soils, deep peat, and peatland habitats in Scotland, which is referred to as the Carbon and Peatland Map (NatureScot, 2016)[1]. According to this map, the Proposed Development is mostly underlain with mineral soils with the western section of the Proposed Development being located upon Class 2 peat which is noted as "*peatland or areas with high potential to be restored to peatland*". A section of the existing access tracks and those leading to T3 also traverse a pocket of Class 1 peat (peat soils covered with peatland vegetation).

Class 1 and 2 peats are considered to be nationally important carbon-rich soils that are of high conservation value. However, it is also worth noting that several areas of bare peat and peat hags were identified within the vicinity of the Proposed Development during the hydrological walkover, as shown in **Photo 7.1** and **Photo 7.2** of **EIAR Chapter 7 – Hydrology.**

2.2 Proposed Development

The repowering proposal will comprise three wind turbines up to 86m to tip. The proposed turbines will replace the three existing two-bladed turbines and two of their locations would be in very close proximity to the current positions. The existing substation building and existing access tracks and turning/passing areas on the Site would be utilised. A short section of new access track will be required to access Turbine 1, with a potential upgrade required to the access track spur leading to Turbine 2. The extent of additional areas such as crane hardstandings and site compound areas will be kept to a minimum.

The Proposed Development, as detailed in **Chapter 1 - Introduction** of the submitted **EIA Report**, comprises:

[1] https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/ (Last Accessed: 07/03/2024)

- Three, three-bladed horizontal axis wind turbines measuring up to 86m tip height and up to 500kW export capacity each;
- Hardstanding areas for cranes at each turbine location;
- Turbine foundations;
- Drainage works;
- A temporary construction compound, including parking, and welfare facilities;
- Associated ancillary works; and
- new access track and upgraded access track.

Further details on the proposed construction methodology are also given in **Chapter 2 – Proposed Development and Design Evolution** of the submitted **EIAR**.

3 Peat Depth Surveys

3.1 Peat Definitions

Peat is a body of sedimentary, naturally occurring material, usually dark brown or black in colour, comprising the partially decomposed remains of plants and organic matter that is preserved in anaerobic conditions within an essentially waterlogged environment. Peat is highly porous and can vary greatly in both composition and depth[2].

The Scottish Governments 'Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments' guidance classes peat deposits of <0.5m in thickness as 'peaty soils'. Peat soil is an organic soil that is comprised of more than 60% of organic matter and is >0.5m in depth[3]. Peat soil with a surface organic layer of >1m is considered to be 'deep peat'.

Peat deposits can exist in one of three forms:

- Fibrous – non-plastic with a firm structure and is only slightly altered by decomposition;
- Pseudo-fibrous – peat in this form still has a fibrous appearance but is much softer and more plastic than fibrous peat. The change is due to more prolonged submergence in airless water rather than to decomposition; and
- Amorphous – decomposition has destroyed the original fibrous vegetation structure such that it has virtually become organic clay.

Peat deposits can also be broadly divided into two layers:

- The upper (acrotelm) layer which is quite fibrous and contains plant roots etc. Acrotelmic peat is relatively dry and has some tensile strength. The acrotelm is generally found in the upper 0.5m of peat deposits, although it is noted in SEPA guidance that this can be found up to 1m deep[1]. The acrotelm is generally suitable for re-instatement as it contains visible plant life, which supports the regeneration of peatland vegetation and carbon sequestration.
- The lower (catotelm) layers are highly amorphous, with very high water content and tend to have very low tensile strength. Generally, the low tensile strength of catotelmic peat means its structure tends to disrupt completely on excavation and handling. Such peat must not be transported any distance, and if it is disturbed

[2] https://www.sepa.org.uk/media/287064/wst-g-052-developments-on-peat-and-off-site-uses-of-waste-peat.pdf (Last Accessed: 29/03/2024)
[3] https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2017/04/peat-landslide-hazard-risk-assessments-best-practice-guide-proposed-electricity/documents/00517176-pdf/00517176-pdf/govscot%3Adocument/00517176.pdf (Last Accessed: 29/03/2024)

it must be reinstated locally under the strictest of care. However, fibrous or semi-fibrous catotelmic peat will generally have suitable structural integrity to be used for lower-level restoration. Any catotelmic peat used for restoration will be capped with a layer of acrotelm to re-establish peatland vegetation.

3.2 Peat Surveys

A peat survey was undertaken by Green Cat Renewables (GCR) in late January 2024. This survey consisted of a targeted sampling regime tailored to cover the proposed access route and infrastructure locations, while gathering data on the depth and structure of peat found on site. A total of 946 peat probes were collected at a density of 10m around the proposed access tracks and infrastructure locations. The National Grid Reference (NGR) Easting and Northing of each probe location to 0.1m was recorded, along with the peat depth, slope angle, peat strength, slope instability, and water conditions. This initial data was then fed into the design evolution of the Proposed Development.

Following this survey, it was evident that Turbine 3 was sited upon an area of deeper peat (peat depth of >2m). This turbine was then moved further south and the hardstanding reorientated to avoid the identified area of deep peat, while continuing to utilise the existing access tracks and hardstandings currently found on site. In an effort to minimise any unnecessary disturbance to the deeper peat and minimise the cut and fill requirement within the peatland, the proposed access track to Turbine 1 was designed to follow the contours within the Site, following a predominantly south-western trajectory. The existing access tracks will be utilised to provide access to Turbines 2 and 3 however, the tracks may require some widening to accommodate certain vehicles during the construction phase. Turbine 1 will require a new hardstanding area, which was designed to be located on a rocky outcrop and sited away from an identified area of deeper peat to the east. The extent of peat coverage and depth of peat on the Site is shown on Figure 7.2 - Peat Depth Map.

Peat soil is present across the majority of the surveyed area, ranging in depth from 0.5m up to 4m in several locations as shown in Table 1.

Table 1 - Average depth range of peat probes[4]

Peat/Soil Depth Range (m)	Number of locations surveyed	Percentage of locations surveyed (%)	Average depth in range (m)
0.0 to <0.5	590	62.4	0.13
≥0.5 to <1.0	177	18.7	0.61
≥1.0 to <2.0	134	14.2	1.24
≥2.0 to <3.0	35	3.7	2.25
≥3.0	10	1.1	4.30
Total / Aggregate	946	100	0.49

The majority of the recorded peat depths (71.6%) across the Site were noted to be <0.5m in depth. The areas of deepest peat (≥2m deep) are prominently found directly north-east of the foundations for Turbine 3, south-west of Turbine 2, and within a band oriented north-to-south immediately to the east of Turbine 1.

[4] Figures presented in this table may not sum due to rounding.

3.2.1 Peat Composition

In terms of composition, most of the peat encountered across the study area was found to be strong with few fibres (73.2%), with most other areas being logged as being strong with many fibres (23.0%). There were also a few locations that were noted as similarly strong, but spongy in nature (3.6%), with rare instances of weak and spongy composition (0.3%) found during the survey.

4 Excavation

4.1 General Design Principles to Minimise Peat Excavations

The proposed wind farm has been designed within the confines of several environmental and geological constraints. From the outset, the design of the proposed wind farm has sought to avoid areas of deep peat which are found to be present on Site and prevent the disturbance of peat habitat altogether and as far as possible, with consideration to topography and various technical constraints. The proposed layout provides an optimal solution that finds the correct balance of the various constraints on Site, given the information available at this planning stage.

A micro-siting allowance of 50m is being sought as part of the application. Micro-siting would be utilised to avoid areas of deep peat whilst maintaining the appropriate buffer distances of sensitive ecological features within the Site such as watercourses and instances of exposed peatland.

During the construction of the proposed wind farm, all reasonable measures will be taken to avoid or minimise excavations, and to minimise disturbance to peat and peatland habitats.

4.1.1 Reducing the Impact on Peatland

The disturbance of peat resulting from the construction of the access tracks, crane hard standings and foundations will be minimised as far as is practicable by considering the following points:

- Re-use and upgrading of existing infrastructure and access routes;
- Temporary retaining structures deployed to reduce the volume of excavations;
- 'Floating' type construction for access infrastructure over deep peat; and
- Low volume foundation construction techniques.

The Contractor will utilise all data which has been collected during the environmental assessment to inform any future construction, while implementing ongoing monitoring throughout this phase in order to minimise peat excavation. Excavated materials will be handled and stored appropriately to maintain integrity for potential reuse.

- An Environmental Clerk of Works (ECoW) has been appointed and will conduct a walkover with engineers prior to works commencing which will identify any areas of sensitive habitat or deep peat;
- The ECoW shall be employed throughout the construction phase to monitor and ensure compliance with the peat management plan with respect to reinstatement, ecological enhancement and sustainability; and
- A programme of geotechnical inspections will be implemented during excavation works to monitor the stability of peatland across the development.

4.1.2 Floating Roads and Laydowns

Where viable and secure options exist, preference is given to construction methods which do not involve peat excavation. The most efficient method of reducing the required volume of peat excavation is through siting

infrastructure outwith areas of deeper peat during the design process. However, when unavoidable, alternative constructional methods such as "floating" can be utilised.

Floating roads are a construction method which removes the need to excavate peat and limits disruption to hydrological pathways and has been employed successfully at many wind turbine developments. Where new tracks are proposed across areas of peat with a depth >1m, then floating construction techniques may be proposed to avoid unnecessary disturbance to peat. Not all peatland is suitable for floating roads and a lot is dependent on the transverse and longitudinal steepness of the land around these infrastructures. Generally, 5% gradient is the maximum for the safe floating of structures.

In general, floating construction techniques will incorporate a geogrid laid on top of the turf surface, which will then be covered in approximately 700 – 1000mm of crushed stones. This will then be topped with an upper layer of durable granular running surface.

Other structures might also be floated. For example, there may be opportunity to float turbine component laydown areas, although this is dependent on other factors including the turbine make and model eventually employed. The same floating construction techniques would be employed.

4.1.3 General Excavation Principles

Where floating construction techniques are unable to be employed, peat would require to be excavated.

Prior to any peat excavations, an Environmental Clerk of Works (ECoW) will be commissioned to carry out a Site walkover to identify any areas of sensitive habitat or deep peat. Additionally, the Principal Contractor will produce a method statement detailing exactly how any excavated peat will be used in reinstatement or habitat restoration works. The statement will outline the requirements for the handling, storage and reuse of peat, and will consider peat layering and potential instability of excavated materials.

Where peat excavations are deemed to be necessary, good practice measures will be followed to ensure that the volume of excavated materials is kept to a minimum. The excavation batter will be as steep as possible from one locality to another to ensure no more peat is removed than necessary to create safe cut angles in the peat. Good practice handling and storage methods will be followed to retain the integrity of the peat as far as possible.

Ground disturbance areas around excavations will be kept to a minimum and will be clearly defined on Site. During construction, access to operational zones will be limited to designated routes, which will consist of constructed tracks.

Appropriate plant will be used to avoid unnecessary disturbance to the ground surface. This includes the use of low ground pressure plant and long reach excavators as appropriate. In areas of deeper peat, mobile plant will be kept to constructed tracks or hardstanding areas.

Any peat to be excavated will have the top layer of vegetation stripped off as turf, prior to construction. These excavated turves will be stored appropriately to maintain their structure prior to reuse. Any underlying catotelmic peat that may be discovered will then be excavated and stored separately, where it will be kept moist. Extreme care will be taken when handling any excavated peat turves and catotelmic peat to reduce the risk of cross contamination between distinct layers.

4.2 Peat Volumes

For activities where it is not possible to remove the requirement to excavate peat entirely, an assessment based on currently available information has been undertaken to calculate the volumes of peat which will need to be excavated.

It is important to note that this document provides the preliminary estimated volumes of materials and potential reuse volumes for the initial Site design, and these volumes may vary depending on ground conditions or discrete design amendments, i.e. the micrositing of infrastructure.

The estimated volumes of excavated peat have been calculated through spatial analysis of the gathered peat depth data using Land Surveying System (LSS) software that is industry standard. The peat depth data points were used to generate a triangle-based Digital Terrain Model (DTM) to predict the peat depths across the Site, based on the relevant data points. Following this, the volume of peat was then estimated for the proposed infrastructure that will require material excavations, using 'prismoidal' volume technique.

As detailed in **Section 3.1**, peat deposits can be divided into two layers. Volumes of excavated peat should be estimated for both acrotelmic and catotelmic peat, based on Natural Power's guidance on carbon-rich soils, deep peat, and priority peatland habitat[5]. The depth of acrotelmic peat can vary significantly as it is determined by site-specific conditions. The acrotelm is generally found in the upper 0.5m of peat deposits, although it is noted in SEPA guidance that this can be up to 1m[1]. Most of the peat gathered on Site was found to be dry in condition with little catotelmic peat. Therefore, the acrotelmic layer has been considered as peat up to 1m in depth within this assessment.

As discussed in **Section 4.1.2.**, where new tracks are proposed across areas of peat with a depth >1m, then floating construction techniques may be used to avoid unnecessary disturbance to peat. The construction of the floating access tracks will not create any volumes of excavated peat. However, the Site will undergo ground investigations at a later stage to confirm the suitability of floating tracks over this terrain. The volumes below are assuming that all proposed infrastructure is utilising cut techniques, as to provide a conservative volume of peat requiring excavation.

4.3 Infrastructure Excavation

Table 2 provides the indicative volumes of peat that are required to be excavated for each infrastructure component of the Proposed Development.

Table 2 - Peat excavation for infrastructure components[6]

Infrastructure Component	Estimated Volume of Acrotelmic Peat (m^3)	Estimated Volume of Catotelmic Peat (m^3)	Total Estimated Volume of Peat (m^3)
Turbine 1 & Associated Crane Pad	328	43	371
Turbine 2	171	0	171
Turbine 3	239	80	319
New Access Track	355	97	452
Total	**1,093**	**220**	**1,313**

The total volume of peat excavation is estimated to be on the order of 1,313m^3.

[5] https://www.naturalpower.com/mediaLibrary/other/english/3787.pdf (Last Accessed: 29/03/2024)
[6] Figures presented in this table may not sum due to rounding.

5 Storage, Reuse, and Reinstatement

5.1 Temporary Storage and Handling of Excavated Peat

The temporary storage of peat has been considered in line with the Scottish Renewables Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat, and Minimisation of Waste[7].

Temporary storage may be required where material is not required for immediate reinstatement or reuse. To minimise handling and haulage distances, excavated material will be stored local to the site of excavation where possible, and/or local to the end–use site where it is required for re-profiling, landscaping, or structural purposes. Stripped materials will be carefully separated to keep soils apart, and then stored in appropriately designed and clearly defined separate piles.

The following measures will be implemented during peat storage:

- Construction areas will be stripped to avoid cross contamination between distinct peat horizons. Clearly defined stockpiles will be created, and side casting is given preference in a manner which allows peat to be returned to the same area it is excavated from. Catotelmic materials, where discovered, shall be separated, with the acrotelmic material retained for in-situ reinstatement. Excavated peat from cut and fill sections of access tracks will be used for dressing the side slopes of floating track sections. Turves and re-usable extracted acrotelmic peat will be stored in accordance with best practice in locations as close as possible to their intended reuse for track restoration. These stores will not be located on sensitive areas of wetland vegetation or within 50m of watercourses.
- The locations of the temporary storage areas shall be identified after a site investigation, and shall be determined in consideration of peat stability, sensitive receptors, and the proposed pollution prevention methods. Sensitive areas, including GWDTEs, shall be avoided for dedicated temporary storage areas. This impact should thus minimise any potential ecological impacts, avoid risks from material instability, and prevent sediment-laden runoff directly discharging into watercourses on Site. The storage location(s) proposed by the Contractor will be agreed with the appointed Ecological Clerk of Works (ECoW) and signed-off prior to commencement of main phase of works.
- To encourage the successful reinstatement of peat turves and minimise the risk of adversely affecting the integrity of the peat and plant communities, the time for which peat would remain out of the ground shall be minimised. Turves will be stored upright and not stacked on top of each other, to ensure turves are not starved of light. Suitable storage will be prioritised towards areas with lower ecological value and low stability risk.
- Peat shall be stored on geo-textile matting which acts as a protective barrier to the underlying soils and vegetation. The geo-textile shall be designed to prevent ingress of groundwater and erosion and de-stabilisation of the base of the stored peat. Peat within any temporary storage shall be stored to a maximum depth of 1m with the peat turfs stored separately from underlying peat. The peat turfs or vegetation layer shall be stored in a single layer.
- A system of watering the stored peat and turves / vegetation shall be in place to ensure that the peat remains damp and prevents drying out and desiccation. If peat is likely to be held unused for more than two weeks then the turves will be monitored to reduce the potential for drying out. If there are signs of drying out, they will be

[7] https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2014/07/assessment-of-peat-volumes-reuse-of-excavated-peat-and-minimisation-of-waste-guidance/documents/guidance-on-the-assessment-of-peat-volumes-reuse-of-excavated-peat-and-the-minimisation-of-waste/guidance-on-the-assessment-of-peat-volumes-reuse-of-excavated-peat-and-the-minimisation-of-waste/govscot%3Adocument/Guidance%2Bon%2Bthe%2Bassessment%2Bof%2Bpeat%2Bvolumes%252C%2Breuse%2Bof%2Bexcavated%2Bpeat%252C%2Band%2Bthe%2Bminimisation%2Bof%2Bwaste.pdf (Last Accessed: 29/03/2024)

sprayed with water. Exposed faces will be similarly treated. Peat shall not be stored in areas where it could be negatively affected by adjacent land use, for example by fertiliser application. Care shall also be taken to ensure that peat replaced over cables is not heavily compacted, to retain as much of the original structure as possible. The vegetation layer and seed bank shall therefore be sustained. This is an important element in the restoration of infrastructure, providing continuity with surrounding local vegetation upon reinstatement. For the duration of time that material is kept in temporary storage it shall be necessary to periodically monitor the condition of the stored peat and ensure the stability is maintained.

- Stockpiles will be isolated from any surface drains and located a minimum of 50m away from watercourses, unless otherwise agreed between the Contractor and ECoW.

Disturbance and loss will be reduced to the minimum necessary for the works and all best practice measures implemented to reduce impacts on peat and the quality of the remaining soils and peat. All peat excavated for constructional activities will be reused and will not be removed from the Site.

5.2 Peat Reuse and Reinstatement Methods

Prior to the commencing of excavation works, consideration will be given to procedures for handling and keeping the excavated materials, most notably peat. Excavation can result in peat losing structural integrity, especially when the material is overhandled or transported around the Site. As such, both the haulage distances of excavated materials and handling will be kept to a minimum.

Reinstatement will be focused on natural regeneration which utilises peat, other vegetated turves, or soils that have been stripped and stored appropriately, as discussed in Section 5.1. Where possible, peat turves with vegetation communities similar to the communities present on the intact peat at receiver sites should be used for dressing the final surface, to encourage early establishment. The appointed ECoW will monitor the success of reinstatement and vegetation establishment. Where the ECoW agrees that additional reinstatement efforts are required, the Contractor shall compose a proposal for re-seeding, which will be undertaken with species appropriate to the surrounding peatland.

Sections 5.2.1 to 5.2.4 discuss the reinstatement methods for any peat that may be excavated due to the construction of access tracks and infrastructure associated with the Proposed Development.

5.2.1 Floating Access Tracks

If deemed to be required, floating tracks will be elevated approximately 1m above the surface of surrounding peatland and will be designed to allow water to infiltrate through the structure of the track and into the adjacent and underlying peat.

Peat will be used to dress off the verges of the floating track and gradually grade them into the surrounding terrain in a manner that maintains slope stability, local landscape, and hydrology. This should reduce the visual impact and help stabilise the roads edges. Where possible, a batter slope of 1:5 will be utilised on the reinstated verges of the floating tracks to help maintain stability. Where possible, turves will be used to surface the peat used in this way. Excavated peat will then be reinstated in a manner which ensures it retains suitable water content to permit re-vegetation.

5.2.2 Cut Access Tracks

During track reinstatement, peat will be placed back in the correct order of horizon and topsoil. Peat turves will then be placed on top to encourage the potential re-growth of vegetation. Reinstated track verges will be laid to a depth of 0.5m to 1m at an angle that grades into the surrounding landscape. Turves will be used to surface the peat, where possible. If insufficient turves are available, then the surface covered by turves should be maximised by laying them in a checkerboard arrangement.

Reinstatement of verges will be carried out as soon as possible to minimise the potential for turves drying out. When laying the verges, the peat will not be arranged too thin to avoid the peat drying out, neither will the peat be laid too thick as this could result in an unstable surface and drainage issues. Excavated peat will then be reinstated in a manner which ensures it retains suitable water content to permit re-vegetation.

5.2.3 Crane Hardstanding and Turbine Foundations

The crane hardstanding required for Turbine 1 is located on a fairly flat area of topography, surrounded by sloping terrain to the south and west. This will result in a certain amount of cut and fill for the infrastructure to be sited appropriately within the topography of the Site. The crane hardstanding area is to remain in place and will be uncovered for maintenance activities. The area around this made ground will be reinstated with soils, vegetated layers, and peat turves that were previously stripped for construction works.

The turbine foundations will be covered over with dense aggregate fill once they are constructed. This will in turn be reinstated which will tie in with the surrounding peatland. Where possible, turves will be used to surface the peat to encourage re-growth of vegetation. The gradient of landscaped verges will be such that water retention is promoted and slowed, to ensure that vegetation can re-establish, as discussed in Section 5.1. The reinstatement works will also be closely monitored by an experienced ECoW, to ensure correct implementation and success of the outline strategy. Excavated peat will then be reinstated in a manner which ensures it retains suitable water content to permit re-vegetation. Reinstatement of verges will also be carried out as soon as possible after the foundation construction to minimise the potential for turves to dry out and decompose.

5.2.4 General Reuse and Reinstatement Methods

Additional design assumptions and management requirements related to the re-use of excavated peat are highlighted below:

- The reinstatement strategy aims to achieve similar groundwater conditions as the surface peat across the heavily altered areas of the Site. Sufficient depth and volume of peat will be used to maintain water content. The peat, which typically has low hydraulic conductivity due to its composition, will help facilitate this process.
- In areas where reinstated soils allow for good drainage, it may be suitable to encourage the growth of dry heathland vegetation by adding a minimal thickness of peaty soils without turf. This approach could lead to the growth of common heather vegetation, helping to establish a protective vegetation cover against erosion and drying out. Peaty soils will be used for reinstatement instead of peat in these areas.
- Landscaped verges will be graded to encourage water retention and facilitate vegetation regrowth. The Ecological Clerk of Works (ECoW) will closely monitor reinstatement efforts to ensure desired outcomes are achieved, making adjustments as needed.
- When reinstating verges, slope stability, local topography, and hydrology will be taken into account to maintain stability.
- Special attention will be given to pollution prevention at watercourse crossings, bog pools, and wetlands, forming a crucial aspect of the site-specific construction environmental management plan.
- The ECoW will be involved in decision-making regarding storage areas and must approve them.
- Relevant construction/site staff will receive training on handling and identifying different types of peat, as well as proper excavation and storage methods. This includes monitoring and maintaining peat bund moisture levels.
- Vegetated buffer zones will safeguard Groundwater Dependent Terrestrial Ecosystems (GWDTEs), protected habitats, and other ecologically sensitive areas from runoff generated by construction activities and the new site layout.

5.3 Peat Reuse Volumes

Where it is not possible to prevent removal of peat altogether, the excavated peat will be reused on Site. GCR have applied their experience of managing the construction of wind farms across various peatland habitats in order to estimate the volume of peat that could be reused as part of construction and habitat restoration.

Peat reuse will be limited to areas on Site already disturbed during construction, and peat will not be placed on intact vegetated areas as this will smother the vegetation. This will also ensure that the associated haulage of peat is kept to a minimum. Table 3 sets out the approximate volumes of peat required for specific restoration activities within identified areas of the Site, based on the currently available information.

Table 3 - Estimated total volumes of peat for reuse on site

Type of Reuse	Potential Reuse	Estimated potential Reuse of Peat (m^3)
Access Tracks	Peat will be reinstalled along the excavated verges of the access tracks at a thickness of c.0.5-1m. Assumes 2.5m wide verge.	450
Turbine Foundations & Hardstandings	Peat will be used to redress and cut and fill slopes around the hardstandings verges and any exposed batters at a thickness of 0.5-1m, assuming a 3m wide batter.	870
Total		1,320

Over the lifetime of the wind farm, it is expected that there will be potential for more peat to be reused on the Site than the volume excavated. Table 4 of potential peat reuse exceeds the estimated volume of excavated peat, which indicates that the Planning Application Boundary has sufficient capacity to accommodate the potential re-use of any excavated peat. Therefore, all the excavated peat generated from the construction of the Proposed Development will be reused on Site and no peat will be taken off Site or wasted.

Table 4 - Net Peat Balance

Total Estimated Volume of Peat (m^3)	Total Estimated potential Reuse of Peat (m^3)	Surplus (+) or Deficit (-) Peat (m^3)
1,313	1,320	-7

It is important to note that these calculations are approximate in relation to both the volumes of peat which can be reused and excavated. In all cases, the calculations are thought to be conservative and are based on the information currently available.

The final operation of peat reuse will be subject to geotechnical on-site tests and experience to determine the overall peat stability and type and use potential.

6 Conclusion

This outline PMP has set out the estimated volume of peat to be excavated and it is considered that any peat disturbed during the construction of the wind farm can be suitably reused within the Site. It is considered that no waste license will be required for the re-powering of Monan Wind Farm.

As outlined, the volumes calculated and presented in this report are conservative and provide an extreme scenario in terms of extraction. The developer and their appointed contractor will review the Site before any construction work commences to ascertain any further savings which can be achieved to avoid the disturbance of peat on Site, and which sections of access tracks will be floated.

This PMP should be treated as a live document and should be read in conjunction with Annex A: Site Work. Further information will be collated with input from statutory consultees and the PMP will be updated and finalised as part of the planning condition discharge. The updated PMP will also include the results of further site investigations and detailed site design, should the project gain consent.

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