Technical Appendix 10.2: Peat Management Plan

Contents

ANNEXES

FIGURES

1.0 Introduction

1.1 General

SLR Consulting Ltd (SLR) was commissioned by Oliver Forest Wind Farm Limited (the Applicant) to undertake a Stage 1 Outline Peat Management Plan (PMP) for the proposed Oliver Forest Wind Farm (the "Proposed Development").

The Proposed Development is located immediately north-west of the village of Tweedsmuir and 19 km north of Moffat, situated entirely within the Scottish Borders Council area.

This Technical Appendix utilises the data obtained from peat surveys conducted by SLR Consulting in September 2022, December 2023 and February 2024, (as detailed in Technical Appendix 10.1).

The work has been undertaken by a team of Geotechnical Engineers and Geologists, with over 10 years' experience in undertaking peat assessments. The team was led by a Chartered Hydrogeologist with 30 years' consultancy experience and specialising in the assessment of soils, geology and water for renewable energy projects in Scotland.

1.2 Site Description

The Proposed Development is currently an active commercial forestry area with ongoing harvesting/replanting operations. The location and layout of the Proposed Development are detailed on Figure 10.2.1 and Figure 10.2.2.

The Proposed Development will comprise seven wind turbines, and associated infrastructure including:

- associated turbine foundations and transformers;
- hardstanding areas for erecting cranes and laydown areas at each turbine location;
- series of new and upgraded on-site access tracks connecting each turbine;
- underground cables linking the turbines to the grid connection;
- on-site substation and Battery Energy Storage System;
- temporary construction compound(s);
- temporary borrow pit search areas; and
- the recreational heritage trail.

Full details of the Proposed Development are provided in Chapter 3.

1.3 Objectives

The PMP outlines the overall approach of minimising disruption to peatland, and it aims to ensure that all further opportunities to minimise peat disturbance and peat excavation would be taken during detailed design and construction of the Proposed Development.

The PMP has been developed to demonstrate that peat has been afforded significant consideration during the construction phase of the Proposed Development, should consent be granted. It aims to identify mitigation measures that would minimise any impacts and the long-term habitat restoration and management plans.

The PMP seeks to identify that appropriate proposals for re-use, re-instatement and restoration of excavated peat can be accommodated within the Proposed Development site and associated with the Outline Nature Enhancement Management Plan (NEMP) (Technical Appendix 8.5) proposals, without significant environmental or health and safety implications, to minimise risk in terms of carbon release and human health.

The purpose of this Technical Appendix is to ensure that there has been systematic consideration of peat management and to provide an initial quantitative assessment to guide the development process. Specifically, the Technical Appendix is intended to:

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

1.4 Role of the Peat Management Plan

The PMP is intended to be a working document to be used throughout the key stages of the design, construction, operation, decommissioning and re-instatement phases of the Proposed Development as part of an overall Construction Environmental Management Plan (CEMP) (Technical Appendix 3.1). These stages are outlined below.

Stage 1: Environmental Impact Assessment (EIA)

The Outline PMP is submitted as part of the EIA Report. From this initial report the PMP will be developed further into a Stage 2 Pre-Construction PMP.

Stage 2: Post Consent / Pre-Construction

As part of the EIA Report it will have been demonstrated that, based on the investigation and data collected, it is likely that the excavated materials for the Proposed Development can be managed in an appropriate manner. The peat mass balance calculations may be further developed with the information obtained during of detailed ground investigation and survey works required to inform detailed design.

Stage 3: Construction Stage

Within micrositing allowances, the alignment and design of tracks, hardstanding orientation and construction methods will be reviewed to avoid/minimise peat disturbance as much as possible considering the more detailed information available once construction commences. Legislation and Guidance

The PMP has been compiled in accordance with the legislation and best practice guidance listed in Section 8.0

Requirements of National Planning Policy 4

The intent of Policy 5 (Soils) of National Planning Policy 4 (NPF4) is "*to protect carbon rich soils, restore peatlands and minimise the disturbance of soils from development*".

The Policy [5(a)] states that development proposals should only be supported if they are designed and constructed:

- in accordance with the mitigation hierarchy by first avoiding and then minimising the amount of disturbance to soils on undeveloped land; and
- in a manner that protects soils from damage including from compaction and erosion, and that minimises soils sealing.

Further [5(c)] confirms that development proposals on peatland, carbon rich soils, and priority peatland will only be supported if they are:

- essential infrastructure and there is a specific locational need and no other suitable site;
- the generation of energy from renewable sources that optimises the contribution of the area to greenhouse gas emissions reductions targets;
- small-scale development directly linked to a rural business, farm or croft;
- supporting a fragile community in a rural or island area; or
- restoration of peatland habitats.

And [5(d)] confirms that where development on peatland, carbon-rich soils or priority peatland habitat is proposed, a detailed site-specific assessment will be required to identify:

- the baseline depth, habitat condition quality and stability of carbon rich soils;
- the likely effects of the development on peatland, including on soil disturbance; and
- the likely net effects of the development on climate emissions and loss of carbon.

Policy 5 also confirms that the site specific (above) assessment [5(d)] "*should inform careful project design and ensure, in accordance with relevant guidance and the mitigation hierarchy, that adverse impacts are first avoided and then minimised through best practice. A peat management plan will be required to demonstrate that this approach has been followed, alongside other appropriate plans required for restoring and/ or enhancing the site into a functioning peatland system capable of achieving carbon sequestration*".

This stage 1 PMP considers the protection and safeguarding of peat and seeks to fulfil the requirements of Policy 5(d) with further detail on peatland habitat and peatland restoration proposals provided in the Outline NEMP (Technical Appendix 8.5).

Mitigation Hierarchy

SEPA has provided a hierarchy of management approaches through which the effectiveness of the approach to peat management is optimised at development sites, as summarised below (SEPA, 2010).

The objectives have been achieved by completion of the following and this terminology has been used throughout the Technical Appendix where applicable:

Prevention: The best management option for waste peat is to prevent or limit its production. This can be done through design, positioning infrastructure in shallower peat or through consideration of alternative construction methods or engineering solutions e.g., floated roads;

Reinstatement: Placement (including partial reinstatement) of peat back into the original location of excavation; e.g. reinstatement of temporary hardstanding areas and temporary excavations, partial reinstatement of tracks;

Re-use (on-site): Using excavated peat in construction away from the original location of excavation e.g; re-use for visual tie-in of verges or re-use in borrow pits to form long-term viable peat stores;

Restoration: on-site or off-site for peatland restoration;

Recycling / Recovery / Treatment: Where peat cannot be re-used on-site or off-site for restoration, it may be used for agricultural benefit or treated/blended with other materials to form a soil substitute or used in other relevant works. This use would require a waste management license or registration as an exempt activity and compliance with the legal requirements;

Storage: Temporary storage of peat on-site (for example, during short periods in the construction phase) and then re-use or reinstatement. Should the peat become unsuitable for re-use or reinstatement during storage, it would be classed as a waste material. Storage of peat up to a depth of 2 m is not classified as a waste and does not require authorisation from SEPA, however care must be taken to ensure that it does not cause environmental pollution; and

Disposal (Waste): Only after all other options have been explored and discounted would this option be considered.

Many of the issues associated with peat on a wind farm site can be accommodated by modifying the development layout to avoid potentially difficult or sensitive areas. Such areas would include:

- areas of deep peat, requiring potentially large volumes of excavation;
- areas of very wet peat (such as flushes, pool and hummock complexes and gullied peatland) which might be important for hydrological connectivity;
- areas of moderate to steep slopes (where site infrastructure might increase the chance of peat instability); and
- areas of sensitive habitat.

Design evolution for the Proposed Development has taken all of the above points into consideration and the layout of infrastructure has been revised accordingly.

2.0 Baseline Conditions

2.1 Definitions of Peat

Peat is defined as a material consisting of the partially decomposed remains of plant material and organic matter preserved over a period in a waterlogged environment resulting in anaerobic conditions, with a depth >0.5 m. Where the organic material is <0.5 m depth then this is not defined as peat. This definition is supported by the following text presented in the following guidance;

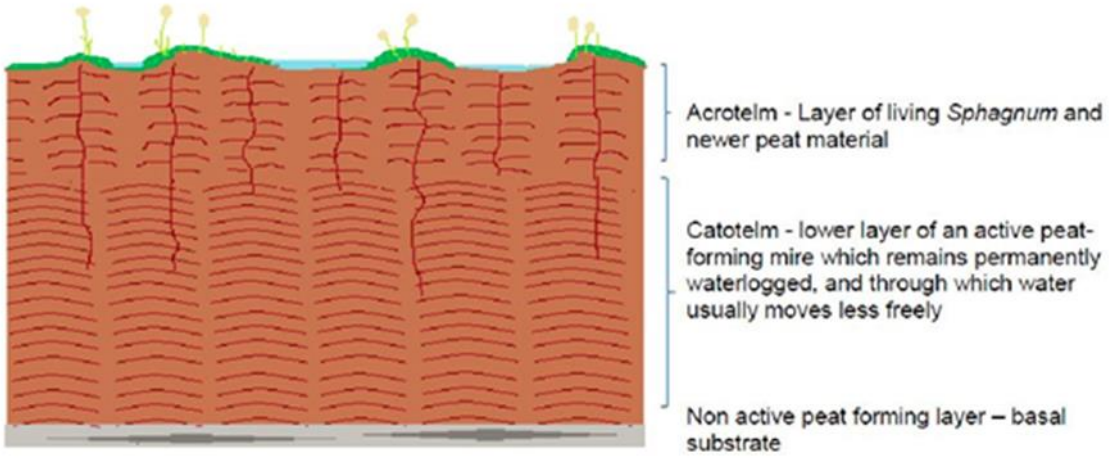
Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland Section 3.3 which states that "*Peat soil is an organic soil which contains more than 60 percent of organic matter and exceeds 50cm in thickness."*

Scottish Government. Scotland's Soils. Soil Survey of Scotland "*Peaty soils have an organic layer at the surface which is less than 50 cm thick*"

The Macaulay Land Use Research Institute define shallow peat as having "*a prescribed depth of organic matter of 50 – 100 cm"*

Peat can be classed as two principal types, the acrotelm layer, and the catotelm layer as shown on Plate 1.

Plate 1: Drawing of two layered Structure of Active Bog Peatlands above Non-Active Peat



The acrotelm layer is found in the upper layer of peat where conditions are relatively dry and comprises living vegetation and partially decomposed plant material which are typically <0.5 m in thickness. Hydraulic conductivity in this layer tends to be higher in relation to distance from the water table. The thickness of the acrotelm layer varies depending on topography such as steepness of slope, peat hags, and hummocks. In particular, the acrotelm layer can be affected during periods of drought or as a consequence of drainage. Fibrous in texture, the acrotelm layer has some tensile strength and is generally considered to be stable for storage and re-use.

The catotelm layer is found under the acrotelm layer and comprises decayed plant material and organisms and is denser and with a very low hydraulic conductivity. The catotelm layer sits below the water table resulting in permanent anaerobic conditions. The catotelm layer can be amorphous and may have lower tensile strength making it less suitable for storage and re-use.

2.2 Peat Conditions

The Scottish Government Carbon and Peatland Map 2016 shows that Class 3 peat soil is present across the majority of the Proposed Development site with minor Class 5 peatland present in the north and south. No Class 1 or 2 peatland is recorded on-site with the closest area of Class 1 peatland located adjacent to the western site boundary.

Class 3 peat deposits are not considered priority peatland although occasional peatland habitats can be found, most soils are carbon rich with localised areas of deeper peat. Mineral soils are mapped across the site adjacent to watercourses. Class 5 indicates that it is unlikely that peatland habitats are present in those areas and that soils are carbon-rich.

A review of the NatureScot SiteLink website indicates that no designated sites are located within the site however a review of the Scottish Borders Council List of Local Biodiversity Sites (LBS) indicates the Glenmuck Bog LBS is present on-site. The Glenmuck Bog is indicated as an area of unmodified blanket bog, valley mire, flush and species rich marshy grassland along a small burn.

Review of NVC mapping indicates the presence of blanket bog habitats on-site on the periphery of the southern site boundary, north-western site boundary, northern site boundary at Upper Oliver Dod and adjacent to the existing track located to the north of Weird Law. Further detail is provided within Chapter 8 and Technical Appendix 8.5.

2.3 Peat Depth Survey

Peat depth surveys have been undertaken across a number of phases by SLR. The surveys carried out followed best practice guidance for developments on peatland (Scottish Government, 2023), (Scottish Renewables & Scottish Environment Protection Agency, 2012).

Phase 1 peat probing resulted in probing on a 100 m grid in developable areas to allow for initial assessment of the Proposed Development site which was used in preliminary site layout designs. The Phase 2 peat probing involved detailed probing undertaken across the Proposed Development infrastructure locations, focussing on access tracks, turbine locations and other site infrastructure in response to design changes. Probing was not possible in areas of dense forestry or areas of felled forestry or wind blown trees with no safe walking access and SLR acknowledge that there are some limited gaps in the probing dataset however the data is considered adequate to undertake this assessment.

Where surveys were undertaken by SLR, the thickness of the peat was assessed using a graduated peat probe, approximately 6 mm diameter and capable of probing depths of up to 10 m. This was pushed vertically into the peat to refusal and the depth recorded, together with a unique location number and the co-ordinates from a handheld Global Positioning System instrument (GPS). The accuracy of the GPS was quoted as ±2 m, which was considered sufficiently accurate for this survey. All data was uploaded into a GIS database for incorporation into various drawings and analysis assessments.

Where the probing recorded less than 0.5 m thick, this has been considered to be an organic/peaty soil rather than peat.

Where the peat probing met refusal on a hard substrate, the 'feel' of the refusal can provide an insight into the nature of the substrate. The following criteria were used to assess material:

- solid and abrupt refusal – rock;
- solid but less abrupt refusal with grinding or crunching sound – sand or gravel or weathered rock;
- rapid and firm refusal – clay; or
- gradual refusal – dense peat or soft clay.

2.4 Peat Depth Results

The results from all probing exercises listed above are detailed in the following sections and the peat depths identified on-site are shown on Figures 10.2.3 and Figure 10.2.4. Further detail is provided on Figures 10.2.5.1 – 10.2.5.7. A total of 1,986 peat probes were undertaken across all survey phases, with the results summarised in Table 1 below.

Table 1 - Peat Probing Results

Peat Thickness (m)	No. of Probes	Percentage (of total probes undertaken on-site)
0 (no peat)	58	2.9
0.01 – 0.49 (peaty soil)	1635	82.3
0.50 – 0.99	184	9.3
1.00 – 1.49	73	3.7
1.50 – 1.99	15	0.8
2.00 – 2.49	8	0.4
2.50 – 2.99	3	0.2
3.00 – 3.49	0	0.0
3.50 – 3.99	2	0.1
> 4.0	8	0.4

The peat was found to vary across the Proposed Development site in terms of thickness and coverage. When viewed in conjunction with peat depth figures, it is evident that the peat is generally limited to flatter lying topographic areas. There were localised areas of peat, defined by topography and undulating bedrock. Deeper peat was generally encountered in flatter, lower gradient areas of the Proposed Development site.

Localised deep peat deposits (>1 m) are located at Turbine 4, turning circle south-east of Turbine 4, east of Turbine 5 turning circle and within the BP-C area. There are areas of localised peat <1 m at Turbine 3 and Turbine 7.

2.5 Peat Condition

Peat core locations were selected to specifically target areas where peat depths recorded peat as described using the von Post[9] classification. Peat samples were collected by SLR in December 2023, using a peat auger and used to inform interpretations of the peat condition and underlying substrate.

Based on interpretations from probing and peat core samples, the peat within the Proposed Development site is predominantly fibrous to pseudo-fibrous. Most of the shallow peat would be classified as between H2 and H5 in the von Post classification, showing insignificant to moderate decomposition. Peat Core logs and photographs are presented within Annex B.

Review of the peat condition data indicates the peat is typically fibrous with the vegetative structure of plants evident throughout the peat with no amorphous catotelmic peat evident. Mineral soils were

recorded beneath the peat in one auger location and were frequently evidenced in exposures associated with drainage and existing track cuttings.

3.0 Potential Impacts on Peat During Construction

The design process for the Proposed Development has minimised the potential for impact on peat and requirement for excavation of peat – while taking account of other constraints (refer to Chapter 2). This has been informed by desk study, walkover observations and targeted peat depth survey work.

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

- wind turbine foundations;
- crane and ancillary hardstandings;
- substation,
- BESS,
- construction compounds;
- access tracks;
- borrow pits; and
- recreational heritage trail.

3.1 Wind Turbines

Wind turbine foundations in peatlands would normally require full and permanent excavation of peat to competent strata, with temporary excavation of peat from a wider diameter to enable safe access to the base of the excavation.

The resulting peat generated could be considered as a permanent loss, unless satisfactory re-use could be achieved within the development site. Some of this peat would normally be re-used to partially reinstate track shoulders, around crane hardstandings and turbine bases, dependent on the suitability of excavated turf and acrotelm peat layer.

3.2 Crane Hardstandings

In order to assemble the wind turbine and enable servicing during operation, crane pads are constructed adjacent to each wind turbine. These must be sufficient to take the weight of both the crane and turbine components, and therefore excavation to underlying competent strata is required.

Crane pads must remain in place for the life of the Proposed Development to enable routine inspection and maintenance. Peat generated from these excavations would be considered a permanent loss, unless satisfactory re-use could be achieved within the development site, dependent on the suitability of excavated turf and acrotelm peat layer.

3.3 Substation, BESS and Construction Compounds

Temporary construction compounds are provided during the construction phase to enable storage of construction materials, turbine components and fuel, siting of welfare facilities and site offices.

Should peat be excavated during the construction of the proposed substation and/or BESS, this peat would be considered a permanent loss if it cannot be reinstated or re-used on-site.

Due to their temporary nature, peat excavated for compounds would normally be stored locally and then will be used to reinstate the temporary construction compound.

3.4 Access Tracks

Access tracks are required to enable passage of construction and servicing traffic around the site. The majority of proposed access tracks for the Proposed Development will be utilising existing forestry tracks.

Over peatlands, the choice of access track design normally reflects the peat depths along the route, with shallow peat/organic soils <1 m deep excavated to competent strata (cut and fill tracks), and deeper peats overlain by floating tracks (with no excavation). No floating tracks are anticipated as part of these development proposals as all access track is on peat with depths less than 1.0 m, and in most cases, substantially less than this.

Access tracks are permanent infrastructure, peat excavated for cut and fill would be considered a permanent loss, unless the peat can be re-used elsewhere on site.

If following more detailed investigations any sections of floating track are deemed necessary, no excavations would be undertaken, and therefore there would be no associated peat excavation.

In excavated tracks, the surface vegetation (i.e. habitat) would be lost unless stored and re-used elsewhere, however the intention would be to re-use excavated turves on verges and track shoulders and hardstandings for landscaping and restoration purposes. Where areas of peat are identified, this would only be re-used where the excavated acrotelm is already dry and where adjoining habitats to the area being restored is of the same dry habitat.

Access tracks have the potential to disrupt natural hydrological drainage pathways, appropriate drainage would be designed to mitigate this.

3.5 Cable Trenching

Electrical cabling from turbines to the substation are typically buried or ducted adjacent to the proposed access track network where practicable (cable trenching). The grid connection cable would similarly be buried or ducted within trenches along the final selected route. Where excavation is required for trenching, peat generated from these works is normally reinstated at its point of origin, and therefore is not considered a volume loss and re-use for reinstatement is a certainty.

3.6 Borrow Pits

Where access track and hardstanding construction materials are required, it is intended to source the material from Borrow Pits within the Proposed Development.

Peat overlying superficial deposits (Glacial Till) or bedrock are excavated and temporarily stored for the duration of construction, and then re-used for borrow pit restoration and landscaping post construction, and therefore re-use is required within the area of the borrow pit. Significant thicknesses of peat are not anticipated at any of the proposed borrow pit search areas at the Proposed Development.

3.7 Recreational Heritage Trail

The proposed recreational heritage trail is located along areas where the peat is measured as less than 0.5 m. The route of the recreational heritage trail is therefore not considered as part of the peat management assessment.

4.0 Mitigation

4.1 Mitigation by Design

The Proposed Development design required to take account of a number of environmental and technical constraints. The design sought to avoid areas of known or potential deep peat where possible, taking into account other environmental and technical factors such as ecology, ornithology, archaeology, hydrology, topography and existing infrastructure.

The Proposed Development has largely avoided areas where peat is >1 m and efforts have been made through the iterative design process to minimise the footprint of site infrastructure on peat >0.5 m as far as practicable.

4.2 Monitoring

All peat and peaty soil excavations are to be overseen and monitored by the appointed ECoW. Extra caution is required when excavating peat within previously afforested areas. The peat in these areas have the potential to be drier, losing structural integrity and may have very little vegetation if recently felled.

The excavated peat must be handled, moved and stored in line with best practice and relocated to an appropriate location which will maintain hydrology of the peat and where necessary appropriate techniques applied to aid recovery; location of reinstated peat and methodology. Where peat and peaty soils are to be excavated, re-used, re-instated or used for restoration, the following good practice applies.

4.3 General Mitigation Measures

Excavation

Excavated peat should be excavated as turves, including the acrotelm (surface vegetation) and a layer of adjoining catotelm (more humified peat) typically up to 0.5 m thick in total, or as blocks of catotelm; the acrotelm should not be separated from its underlying peat:

- the turves should be as large as possible to minimise desiccation during storage, though the practicalities of handling should be considered;
- contamination of excavated peat with substrate materials to be avoided at all times; and
- consider timing of excavation activities to avoid very wet or frosty weather and avoid multiple handling to minimise the likelihood of excavated peat losing structural integrity.

If possible, extract intact full depth acrotelm layers from the top surface of the peat deposit. This technique would maintain connectivity between the surface vegetation and the partially decomposed upper layers of the catotelm.

Storage

The following good practice applies to the storage of peat:

- stripped materials should be carefully separated to keep peat and other soils apart;
- minimise handling and haulage distances, excavated material should be stored local to the site of excavation or end point of restoration;
- peat turves should be stored in wet conditions or irrigated in order to prevent desiccation (once dried, peat will not rewet);
- peat should be stored green side up to avoid drying out of the peat and encourage vegetation growth during storage. The store should be covered with turf as far as possible to prevent drying out and death of roots, particularly if storing for a long time;
- peat should be stored for as short a period as feasible. Prolonged storage increases the risk of plants dying and becoming of less use for restoration;
- stockpiling of peat should be in large volumes to minimise exposure to wind and sun (and desiccation), but with due consideration for slope stability, but should not exceed 1 m in height to maintain stability of stockpile;
- stockpiles should be isolated from watercourses or drains with appropriate bunding to minimise pollution risks;
- excavated peat and topsoil stored separately, should be stored to a maximum of 1 m thickness;
- stores of non-turf (catotelm) peat should be bladed off to reduce the surface area and desiccation of the stored peat; and
- peat storage areas should be monitored during periods of very wet weather, or during snowmelt, to identify early signs of peat instability.

Temporary Storage around Infrastructure

Any peat to be removed during construction would require a temporary storage area near to the construction works/area of proposed reinstatement or re-use. Where peat cannot be transferred immediately to an appropriate restoration area, short-term storage would be required. In this case, the following good practice applies:

- peat should be stored around the infrastructure perimeter at sufficient distance from the cut face to prevent overburden induced failure;
- local gullies, diffuse drainage lines (or very wet ground) and locally steep slopes should be avoided for peat storage; and
- drying of stored peat should be avoided by irrigation to mitigate against drying out (although this is unlikely to be significant for peat materials stored less than two months).

For longer term storage requirements (e.g. at turbines, hardstandings, borrow pits and compounds), the following good practice applies:

- where practicable, peat generated from excavations should be transported directly to its allocated restoration location, to minimise the volume being stockpiled with the possibility of drying out;
- stores of catotelmic peat should be bladed off to reduce their surface area and minimise desiccation;

- where transport cannot be undertaken immediately, stored peat should be irrigated to limit drying and stored on a geotextile mat to promote stability; and
- monitoring of large areas of peat storage during wet weather or snowmelt should be undertaken to identify any early signs of peat instability.

Following temporary storage, peat is to be re-used or reinstated. If the peat is unsuitable for re-use or reinstatement during storage, it would be classed as a waste material and disposed of.

Transport

The following good practice applies to transport:

- movement of turves should be kept to a minimum once excavated, and therefore it is preferable to transport peat planned for translocation and reinstatement to its destination at the time of excavation; and
- if Heavy Goods Vehicles (HGVs)/dump trucks that are used for transporting non-peat material are also to be used for peat materials, measures should be taken to minimise cross-contamination of peat with other materials.

Handling

Following refinement of the excavated peat model, a detailed storage and handling plan should be prepared as a detailed PMP forming part of the detailed CEMP, including:

- best estimate excavation volume at each infrastructure location (including peat volumes split into area/volume of 'acrotelm' or 'turf', and volume of catotelm);
- volume to be stored locally and volume to be transferred directly on excavation to restoration areas elsewhere (e.g. disused quarries, borrow pits or peatland habitat restoration areas) in order to minimise handling;
- location and size of storage area relative to infrastructure foundations/areas and natural peat morphology / drainage features; and
- irrigation requirements and methods to minimise desiccation of excavated peat during short term storage.

These parameters are best determined post-consent in light of detailed ground investigation with the final design areas for each element of infrastructure.

4.4 Restoration

Any peat not re-used or utilised for reinstatement or landscaping purposes will be considered for relocation and use in habitat enhancement. Excavated turves and acrotelmic peat may be utilised to support the restoration activities detailed in the Outline NEMP in relation to enhancement of Moorland Habitats.

During restoration of peat on-site or off-site, the following best practice should be followed:

- carefully evaluate potential restoration sites, such as borrow pits for their suitability, and agree that these sites are appropriate with the Environmental Clerk of Works (ECoW), landowners and relevant consultees;
- consider early engagement with a specialist seeding contractor to aid reseeding works;
- undertake restoration and revegetation or reseeding work as soon as possible;
- where required, consider exclusion of livestock from areas of the Proposed Development undergoing restoration, to minimise impacts on revegetation;
- work out of areas so that the newly placed peat will not need to be disturbed or trafficked again;
- top peat will be placed loosely and firmed down by gently tamping down with the digger bucket teeth, especially if dry to reduce wind erosion;
- peat should be placed to undulating profiles;
- peat should be spread by digger bucket leaving a rutted rough surface. Care will be taken not to blade grade or smooth off or compact the top peat with the digger bucket;
- turfs will be placed green side up with roots buried;
- ensure edges of turfed areas are level to existing ground to prevent wind erosion;

- where turf supply is limited, it should be placed in an irregular chequer board pattern with gaps between turfs into which natural growth will spread; and
- avoid spreading in prolonged hot and dry weather where the risk of the peat drying out is high.

Timing of Restoration Works

Table 2 gives an indication of when restoration will commence for each of the areas. As far as reasonably practicable, restoration should be carried out concurrently with construction rather than at its conclusion.

Table 2 – Commencement of Restoration

Area	Commencement of restoration timescales
Temporary Construction Compound	Restoration will not commence until the site has been commissioned and the works have been substantially completed and the site compound decommissioned.
Track Verges	On installation of the final surfacing layer restoration of track verges may commence.
Foundations	Following removal of the shutters and allowing sufficient time for the concrete to cure, the foundations will be backfilled and restoration works will commence.
Cabling	Restoration of cable routes will commence shortly after the installation of cables within trenches.

4.5 Monitoring and Inspection

There would be frequent, routine and regular inspections of peat in all stockpiles and temporary storage areas as part of the PMP audit process. Inspections would assess in-situ peat physical conditions, integrity of containment and temporary drainage conditions, and they would seek to confirm that stockpile design and management was adequate to prevent erosion and peat slide. These inspections would take place weekly during stockpile creation and storage.

Should any problems be observed during regular visual inspections of peat stockpiles, this would invoke implementation of an appropriate corrective action which would be recorded and monitored for effectiveness. Types of corrective actions would include, but would not necessarily be limited to; modification of temporary drainage, additional or modified bunding, incorporating of sediment fencing if required, light re-grading to correct any areas of surface erosion, etc.

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

- peat surface, peat profile and peat consistency conditions would be carried out as part of ground investigations prior to the start of construction. This information would provide detailed information on the baseline conditions for each part of the infrastructure footprint;
- re-use, restored and reinstated peat conditions would be inspected immediately after restoration to ensure that the methods detailed in the PMP had been correctly implemented and to inform any corrective actions should they be required; and
- the physical condition of peats would be retained as carefully as possible both at the peat storage and the peat restoration stages. This is particularly important for vegetation establishment.

4.6 Specific Mitigation

There are a number of ways in which detailed design and construction activities can be specified to minimise impacts on peatlands. The following section outlines briefly the likely mitigation required to minimise impact, based on the re-use of peat specific to key elements of the Proposed Development.

Wind Turbine Foundations

Wind turbine foundations represent permanent excavation and the primary mitigation measure is to locate the wind turbines to avoid the areas of deepest peat, thereby reducing excavated volumes. Technical Appendix 10.1 details peat depths in relation to proposed infrastructure, The average peat depth at turbine locations is 0.21 m. Peat is present at the location of Turbine 4 however it is localised within the footprint with an average depth of 0.4 m and the positioning of these aspects of the Proposed Development have been guided by the results of the peat probing surveys.

Crane Hardstandings

In relation to crane hardstanding, guidance is to avoid their full reinstatement post-construction and these areas of the crane hardstanding would represent permanent excavation given the likelihood of re-use for maintenance activities associated with the wind turbines. The primary mitigation is to locate the crane hardstandings to avoid the areas of deepest peat, thereby reducing excavated volumes. Technical Appendix 10.1 details peat depths in relation to proposed infrastructure. The average peat depth at hardstandings locations is 0.2 m. Peat is present at the location of the hardstanding at Turbine 4

however it is localised within the footprint with an average depth of 0.4 m and the positioning of these aspects of the Proposed Development have been guided by the results of the peat probing surveys.

Areas of temporary hardstanding should be reinstated. Therefore, the following good practice guidance applies to reinstatement of compound areas:

- peat stripped from hardstanding areas would not be stored higher than 1 m and could require to be seeded in the short term to prevent drying out, if stored for long residence times;
- stripped turves are used for final reinstatement, however where turves are insufficient or vegetation regeneration requires reseeding, temporary fencing may be considered around hardstanding areas undergoing reinstatement in order to prevent grazing; and
- the choice of seed mix for reseeding should be appropriate to the ecological and hydrological conditions of the reinstated hardstanding location and surrounding habitats and should be advised by the ECoW.

Access Tracks

There is much guidance available to support access track design in upland areas including peatlands. See (Scottish Natural Heritage (SNH), SEPA, Scottish Government & James Hutton Institute. (2014)) and (Scottish Renewables, Scottish Natural Heritage, Scottish Environmental Protection Agency, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland, AEECoW (2019)). Guidance is generally focused on floating tracks and new and upgraded excavated tracks and is summarised below.

Based on the avoidance of significant areas of deep peat during design iterations, the access tracks are typically present on more localised areas of peat <1.0 m with the average depth of peat and soils recorded at 0.29 m along new and upgraded tracks. Based on the site gradients, it is anticipated that all tracks would be excavated tracks which would require re-use of peat and peaty soils for verge reinstatement.

An area of deep peat and M19a habitat was identified on the north-western side of the proposed upgraded access track in the area of Glenmuck Bog between Turbine 2 and Turbine 5.

Any upgrading to the track should be undertaken on the eastern side of the track at this location where peat and peaty soils are absent and excavation should be within the observed mineral soils to mitigate potential impacts to this receptor.

Excavated tracks require complete excavation of any peat (where present) to a competent substrate. Excavated tracks would generally be undertaken where peat depths are less than 1 m. The excavated peat would require temporary storage ahead of re-use elsewhere within the Proposed Development in accordance with guidance detailed in Section 4.0 which would ensure the integrity of the peat is retained and there is no peat loss. Good practice guidance relates mainly to drainage in association with excavated tracks:

- trackside ditches should capture surface water (within the acrotelm) before it reaches the road;
- interceptor drains should be shallow and flat bottomed (and preferably entirely within the acrotelm to limit drawdown of the water table);
- any stripped peat turves should be placed back in the invert and sides of the ditch to assist regeneration and prevent erosion to the peat and wash out that could occur; and;
- culverts and cross drains should be installed under excavated tracks to maintain subsurface drainage pathways (such as natural soil pipes or flushes). Discharge from constructed drainage should allow for as much diffuse dispersion of clean (silt free) water as possible while minimising disturbance to existing peatland as far as possible. Silt mitigation measures would be incorporated into all constructed drainage as per the requirements of the CEMP.

Although excavation is normally undertaken in peat of minor thickness (<1.0 m), there is a possibility of minor slippage from the cut face of the peat mass. Accordingly:

- free faces should be inspected for evidence of instability (cracking, bulging, excessive discharge of water or sudden cessation in discharge); and
- where significant depths of peat are to be stored adjacent to an excavation, stability analysis should be conducted to determine Factor of Safety (FoS) and an acceptable FoS adopted for loaded areas.

Regular routine monitoring should be scheduled post-construction to ensure that hydrological pathways and track integrity have been suitably maintained.

Use of Soil and Peat as Trackside Shoulders

Excavated soil will generally be re-used on site for partial track shoulder reinstatement and of constructed access tracks. Some limited re-use of peat for trackside verges can be considered using good practice at the margins of an access track under the following conditions:

Peat is only re-used at the edges of tracks if:

- there is valid need and it provides an environmental benefit, e.g. reduces or buffers runoff, encourages habitat restoration, stabilises verges, minimises visual impact;
- re-used peat consists of turves and drier acrotelm peat only, which is anticipated on this site; and
- widths of reinstated verges are kept to a minimum, defined on a case by case basis and be fully justified.

Care should be taken when forming verges and landscaping with soil and peat so as not to over-deposit arisings to the detriment of the works. Therefore, low verges are used on the sides of the track to permit any surface water to drain naturally, and diffusely, where it arises.

Re-use and reinstatement is only applied in stretches of low longitudinal track gradient (e.g. <5) to ensure stability, with batters used to form stable slopes.

Rapid revegetation of the soil and peat surface through the use of stored turves or re-seeding is encouraged to stabilise the re-use and reinstated areas and minimise erosion.

Buffer zones are maintained around surface water bodies where no peat re-use or reinstatement is carried out.

Verges may also be suitable locations for burying cables to avoid excavating cable trenches in undisturbed peat material. If this is planned, then the verges should be constructed wider to accommodate the cabling.

Careful assessment and selection of peat by the ECoW to be used for re-use and reinstatement, in line with the guidelines set out above, will ensure that peat integrity is retained and there will be no loss of peat through this process.

Floating Access Tracks

The use of floating access track is not anticipated as part of the Proposed Development. If following further, more detailed site investigations, a requirement for floating track is deemed necessary, the following guidance should be followed.

Over deeper peat (typically >1.0 m), floating tracks are used to remove the requirement for peat excavation and limit disruption of hydrological pathways. The success of construction requires careful planning to take account of the unique characteristics of peat soils. Specific guidance is available on design, the duration and timing of construction, the sequence of construction and the re-use of peat on the shoulders of the floating access track. Floated tracks will be utilised where possible when peat depths of greater than 1.0 m are identified along with shallow topography in the area (generally below 5%) and the section is long enough to make floating track appropriate.

<u>Design of Floating Access Tracks</u>

The following issues should be considered during detailed design of floating access tracks:

- adopting conservative values for peat geotechnical properties during detailed design (post-consent);
- applying a maximum depth rule whereby an individual layer of geogrid and aggregate should not normally exceed 450 mm without another layer of geogrid being added;
- on gently sloping ground and where the access track runs transverse to the prevailing slope, accommodating natural hydrological pathways such as flushes and peat pipes through installation of a permanent conduit within or underneath the track and allowing for as much diffuse discharge (while minimising disturbance to existing peatland) on the downslope as possible;
- ensuring transitions between floating tracks and excavated tracks (or other forms of track not subject to long term settlement) are staged in order to minimise likelihood of track failure at the boundary between construction types;
- scheduling access track construction to accommodate for, and reduce peat settlement characteristics; and
- re-use of existing roads (with upgrading if required), where possible.

Duration and Timing of Construction of Floating Access Tracks

The critical factor in successful construction of floating access tracks is the timescale of construction, and the following good practice guidance is provided:

The settlement characteristics of peat; should be accommodated by appropriate scheduling of access track construction, as follows:

Sequence of Construction

The sequence of construction is normally stipulated in guidance provided by the supplier of the geotextile or geogrid layer, and suppliers are often involved in the detailed access track design. Good practice in relation to the sequence of access track construction is as follows:

- retaining rather than stripping the vegetation layer (i.e. the acrotelm, providing tensile strength), and laying the first geotextile/geogrid directly on the peat surface;
- adding the first rock layer;
- adding the second geotextile/geogrid, and add overlying graded rock fill as a running surface;
- HGVs using the access tracks during the construction period should be trafficked slowly in the centre of the track to minimise dynamic loading from cornering, braking and accelerating;
- ensuring wheel loads should remain at least 0.5 m from the edge of the geogrid, markers should be laid out, monitored and maintained on the access track surface to clearly emphasise these boundaries; and
- ongoing 'toolbox' talks and subsequent feedback to construction and maintenance workers and drivers to emphasise the importance of the implementing the above measures.

Re-use of Peat as Trackside Shoulders

There is potential for re-use of excavated peat (from other areas of the site) in landscaping of floating access tracks. Wedge-shaped re-use at the margins of a floating access track (which is elevated above the peat surface) is termed shoulders, and good practice guidance is as follows:

- peat is only re-used at the edges of tracks if:
  - there is valid need and it provides an environmental benefit, e.g. reduces or buffers run-off, encourages habitat restoration, stabilises verges, minimises visual impact;
  - re-used peat consists of turves and drier acrotelm peat only, which is anticipated on this site; and
  - widths of reinstated verges are kept to a minimum, defined on a case by case basis and be fully justified;
- re-using peat excavated from elsewhere on site as shoulders adjacent to the floating track;
- peat shoulders should taper from just below the track sides (thereby preventing over high shoulders from causing ponding on the track surface) to join the surrounding peat surface, keeping as natural a profile as possible to tie in with existing slope profiles;
- limiting the width of peat shoulders to avoid unnecessary smothering of intact vegetation adjacent to the floating track;
- peat must not be laid too thinly (minimum 0.5 m) to avoid drying out;
- peat must not be compressed during reinstatement to prevent cracking; and
- Where possible, these should be capped with turves or seeded as quickly as possible to prevent run-off erosion and should not be left bare for excessive periods.

Temporary Construction Compound Areas

All construction compounds are considered temporary and peat would be used for reinstatement following completion of the construction phase.

In relation to construction compound areas, these would used for storage and maintenance activities associated with the construction phase of the Proposed Development. Therefore, the following good practice guidance applies to reinstatement of compound areas:

- peat stripped from compound areas would not be stored higher than 1 m and could require to be seeded in the short term to prevent drying out, if stored for long residence times;
- stripped turves are used for final restoration, however where turves are insufficient or vegetation regeneration requires reseeding, temporary fencing may be considered around compound areas undergoing restoration in order to prevent grazing; and

- the choice of seed mix for reseeding should be appropriate to the ecological and hydrological conditions of the restored compound location and surrounding habitats and should be advised by the ECoW.

Substation and BESS

The substation and BESS will require permanent excavations prior to construction. The primary mitigation measure for all permanent structures has been to locate the relevant infrastructure to avoid the areas of deepest peat, thereby reducing excavated volumes of peat. All permanent excavations should follow the procedures detailed in Section 0 . The following good practice guidance applies to re-use of peat for restoration of these areas:

- stripped turves are used for final restoration, however where turves are insufficient or vegetation regeneration requires reseeding, temporary fencing may be considered around areas undergoing restoration in order to prevent grazing; and
- the choice of seed mix for reseeding should be appropriate to the ecological and hydrological conditions of the restored compound location and surrounding habitats and should be advised by the ECoW.

Temporary Borrow Pit Search Areas

Peat is proposed for re-use within borrow pits for the purpose of re-use and restoration. This is subject to method of re-use being consistent with the environmental reinstatement objectives of the Proposed Development and does not present residual risks from pollution of the environment or harm to human health. Key issues for borrow pit restoration are:

- prevention of desiccation and carbon losses from peat used in the restoration;
- development of complete vegetation cover through emplacement of peat turves or seeding with an appropriate species; and
- fencing where required, to exclude grazing stock and to encourage vegetation establishment.

Post construction Monitoring

The restored areas will be monitored following completion of construction activities to assess new growth, germination of seed bank, and overall vegetation cover. Suitable locations will be identified for monitoring purposes which will be representative of the different habitats reinstated throughout the site.

If there is insufficient vegetation to reasonably expect vegetative re-colonisation within five years, a seed mix appropriate to the site will be applied. Re-seeding will be avoided if there is sufficient plant material in the turves or topsoil. The species mix and application technique will be agreed beforehand with NatureScot but the mix is likely to contain seed of widely occurring species typical of either heath land communities or upland acid grassland communities.

5.0 Peat Balance Assessment

Table 3 provides an estimate of peat and peaty soil volumes to be excavated and re-used during the construction of the Proposed Development. The peat and peaty soil excavation and re-use volumes are detailed for each infrastructure element in Annex A. The excavated materials data from Annex A indicates that the areas of infrastructure within the Proposed Development are typically located in areas of peaty soils with very limited infrastructure present in areas of peat >0.5 m.

5.1 Excavated Volumes

Peat excavation volumes associated with the construction of the Proposed Development have been calculated using the results from the peat depth surveys and interpolation using the GIS package ArcGIS. Peat excavation volumes are detailed in Table 3 and Annex A and based on the following assumptions:

- Interpolation of peat depth was undertaken using the Inverse Distance Weighting (IDW) interpolation method.
- An estimated acrotelm depth of 0.5 m across all infrastructure based on peat depth survey results.
- The acrotelm volumes have been calculated based on the average peat depth across each item of infrastructure and linear infrastructure based on peat depth survey results.
- An assumption that the peat probe depths are representative of the actual depth of peat (validated by the peat coring).
- The excavated volumes will comprise primarily acrotelmic peat and soils.

5.2 Re-use Volumes

The volume of peat to be re-used around the Proposed Development is detailed in Table 3 and Annex A and based on the following assumptions:

- In appropriate locations around the infrastructure perimeter such as track verges and the edges of permanent structures, a 1.5 m wide strip either side of the track at a thickness of about 0.5 m (turves and acrotelmic peat).
- In appropriate locations around the perimeter of turbine and hardstandings with a 1 m wide strip and with an average peat depth of 0.5 m.
- Reinstatement of temporary compound areas with an average peat depth of 0.5 m to ensure integration with the adjacent habitat areas where possible which comprise blanket bog.
- Borrow pits will re-use peat with an average peat depth of 0.5 m to ensure integration with the adjacent habitat areas where possible which comprise blanket bog.

5.3 Net Peat Balance

Table 3 provides an estimate of peat volumes to be excavated and re-used during the construction of the infrastructure identified in Table 3 as being located within an area of peat >0.5 m.

Table 3 - Peat Balance Assessment

Infrastructure	Volume of Peat/Peaty Soils Excavated (m^3)	Volume of Peat/Peaty Soils Re-used and Reinstated (m^3)
New Access Track	1,868	2,242
Upgraded Access Track	3,314	5,178
Turning Heads	424	250
Turbine Bases - formation only	1,039	330
Crane Pads	5,040	350
Ancillary Laydown Areas	7,350	7,350
Substation	1,428	100
BESS	1,500	100
Temporary Satellite Compound	168	400
Wind Farm Temporary Compound	715	2,750
Borrow Pit Search Area A	660	3,000
Borrow Pit Search Area B	720	3,000
Borrow Pit Search Area C	1,740	3,000
Total	25,966	28,050

The total volume of peat predicted to be excavated of 25,966m^3, does not exceed the intended total peat re-use volume of 28,050m3, therefore no excess peat is required to be disposed off-site for the Proposed Development.

6.0 Waste Clarification

This section of the Stage 1 PMP includes the method for dealing with peat which could potentially be classified as waste (only if the above volumes estimate significant quantities of catotelmic peat, which cannot be re-used).

Table 4 outlines where those materials that are likely to be generated on-site, fall within the Waste Management Licensing (Scotland) Regulations 2011.

Based on the results presented in Table 4, it has been concluded that all of the materials to be excavated on-site would fall within the non-waste classification as the peat would be re-used on-site. Based on a detailed probing exercise and visual inspection of the peat, it is predominantly found to be fibrous and fairly dry within the top metre before becoming slightly more pseudo-fibrous with depth.

The majority of the excavated peat is therefore entirely re-useable as it is predominantly fibrous and easily re-used on-site. Areas of extensive deep peat have been avoided by design, where possible.

Table 4 - Excavated Materials – Assessment of Suitability

Excavated Material	Indicative Volume on Site by % of total excavated soils	Is there a suitable use for material	Is the Material required for use on Site	Material Classified as Waste	Re-use Potential	Re-use on-site
Turf (Surface layer of vegetation and fibrous matt) and Acrotelmic Peat	95	Yes	Yes	Not classified as waste	Yes	Will be re-used in reinstatement of floated access track verges, cut and fill verges, road verges, side slopes and check drains. Peripheral embankments of turbine bases, crane hardstandings and reinstatement of borrow pits.
Catotelmic peat	05	Yes	Yes*	Not classified as waste	Yes	Will be re-used in reinstatement of floated access track verges, cut and fill verges, road verges, side slopes and check drains. Peripheral embankments of turbine bases, crane hardstandings and reinstatement of borrow pits.
Amorphous Catotelmic Peat (amorphous material unable to stand unsupported when stockpiled >1 m)	Not anticipated as it has been avoided by design.	Potentially	Potentially *	Potentially if not required as justifiable restoration of peatland habitat management works	Limited	If peat does not require treatment prior to re-use it can be used on-site providing adequate justification and method statements are provided and approved by SEPA. If it is unsuitable for use without treatment, then it may be regarded as a waste. However, every attempt to avoid this type of peat has been incorporated into the design.

*Catotelmic peat is considered unlikely to be excavated, however if encountered the field investigations have confirmed this material is predominantly fibrous and is considered suitable for re-use.
**Such uses for this type of material are limited, however there may be justification for use in the base of borrow pits to maintain waterlogged conditions and prevent desiccation of restored area and in some habitat management works such as gully or ditch blocking where saturated peat is required to mimic mire type habitats and encourage establishment of sphagnum

7.0 Conclusion

This Stage 1 PMP presents a pre-construction assessment of the estimated peat excavation and re-use volumes associated with the works phase of the construction of the Proposed Development. The PMP also provides the guiding principles which would be applied during the construction of the Proposed Development.

Through a process of continued design refinement (focused on minimising peat excavation volumes) and adoption of best practice working methods, the Proposed Development is expected to achieve an overall peat balance. Therefore, all excavated material would be required for re-use as part of the works and no surplus peat is anticipated.

The PMP addresses the following peat related issues:

- the depth and condition of peat deposits at site;
- the volumes of peat that are predicted to be excavated and its suitability for re-use;
- the capacity to re-use the peat on-site;
- peat handling and temporary storage; and
- restoration and monitoring of peatland habitat.

The figures detailed within this Technical Appendix are to be considered indicative, at this stage. The total peat volumes are based on a series of assumptions for the layout of the Proposed Development and the results of multiple phases of peat probing. Such parameters can still vary over small scale areas and therefore topographic changes in the bedrock profile could impact the total accuracy of the volume calculations.

The various calculations presented here would be updated and expanded upon as part of detailed design works, taking account of pre-construction site investigations and micrositing, to confirm actual quantities of arising peat. The Applicant would achieve an actual balance between arising peat and reinstatement by prioritising the areas for reinstatement, following advice from the project ECoW and Geotechnical Engineer. It is anticipated that a detailed, construction phase PMP would be developed, which would be maintained and updated in conjunction with a Geotechnical Risk Register (as part of the CEMP). The implementation of the detailed PMP would ensure a robust commitment to excavating, storing and reinstating peat in a manner that follows best practice and ensures the protection of peat throughout the construction and post-construction phases

8.0 References

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ANNEX A – EXCAVATED MATERIALS CALCULATIONS

Infrastructure on Peat	Length (m)	Width (m)	Area (m^2)	Average Depth of Peat (m)	Number	Total Excavated Volume Acrotelm Peat (m^3)	Total Excavated Volume Catotelm Peat (m^3)	Total Excavated Volume Peat (m^3)	Length (m)	Width (m)	Area (m^2)	Average Thickness of Peat (m)	Number	Total Re-use Volume Acrotelm Peat (m^3)	Total Re-use Volume Catotelm Peat (m^3)	Total Re-use Volume of Peat (m^3)	Notes
New Access Track	1495	5	7473	0.25	1	1868		1868	1495	1.5	2242	0.50	2	2242		2242	
Upgraded Access Track	3452	3	10357	0.32	1	3314		3314	3452	1.5	5178	0.50	2	5178		5178	
Turning Heads	-	-	707	0.12	5	424		424	100	1	100	0.50	5	250		250	
Turbine Bases - formation only	-	-	707	0.21	7	1039		1039	94	1	94	0.50	7	330		330	
Crane Pads			2400	0.30	7	5040		5040	100	1	100	0.50	7	350		350	Permanent area only
Hardstanding - Ancillary Laydown Areas	-	-	3500	0.30	7	7350		7350	-	-	3500	0.30	7	7350		7350	Includes temporary clearance areas
Substation	-	-	8400	0.17	1	1428		1428	200	1	200	0.50	1	100		100	
SPEN Substation	-	-	7500	0.20	1	1500		1500	200	1	200	0.50	1	100		100	
Temporary Satellite Compound	-	-	800	0.21	1	168		168	-	-	800	0.50	1	400		400	
Wind Farm Temporary Compound	-	-	5500	0.13	1	715		715	-	-	5500	0.50	1	2750		2750	
Borrow Pit A	-	-	6000	0.11	1	660		660	-	-	6000	0.50	1	3000		3000	
Borrow Pit B	-	-	6000	0.12	1	720		720	-	-	6000	0.50	1	3000		3000	
Borrow Pit C	-	-	6000	0.29	1	1740		1740	-	-	6000	0.50	1	3000		3000	
Totals						**25966**	**0**	25966						**28050**	**0**	28050	

Total Excavated Volume Acrotelm Peat (m^3)	**25966**
Total Excavated Volume Catotelm Peat (m^3)	**0**
Total Excavated Volume Peat (m^3)	25966
Total Re-use Volume Acrotelm Peat (m^3)	**28050**
Total Re-use Volume Catotelm Peat (m^3)	**0**
Total Re-use Volume of Peat (m^3)*	28050
Net Balance (m^3)	**-2084**

ANNEX B – PEAT CORE DATA

Peat Core Log

Hole No.
PC01
Sheet 1 of 1

Project: Oliver Forest Wind Farm	Client: Oliver Forest Wind Farm Ltd		Dates: 13-12-2023
Project No: 405.064770.00001	Logger: CR	Approved By: RW	Coordinates: E: 307858.00 N: 624317.00
Location: Tweedsmuir	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 1.00	C	0.00 - 1.00	Recovery = 100%	1.00			Brown fibrous PEAT. (H3), (B3).
	1.00 - 1.80	C	1.00 - 1.80	Recovery = 100%	1.60			Brown pseudofibrous PEAT. (H4), (B3).
					1.80			Brown pseudofibrous PEAT. (H5), (B3).
								Peat Core Complete at 1.80m

Remarks:

Peat Core Log

Hole No.
PC02
Sheet 1 of 1

Project: Oliver Forest Wind Farm	Client: Oliver Forest Wind Farm Ltd		Dates: 13-12-2023
Project No: 405.064770.00001	Logger: CR	Approved By: RW	Coordinates: E: 307872.00 N: 624323.00
Location: Tweedsmuir	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 1.00	C	0.00 - 1.00	Recovery = 100%	0.40			Brown fibrous PEAT. Frequent plant fibres throughout. (H2), (B4).
					1.00			Brown fibrous PEAT. (H3), (B4).
								Peat Core Complete at 1.00m

Remarks:

Peat Core Log

Hole No.
PC03
Sheet 1 of 1

Project: Oliver Forest Wind Farm	Client: Oliver Forest Wind Farm Ltd		Dates: 13-12-2023
Project No: 405.064770.00001	Logger: CR	Approved By: RW	Coordinates: E: 307995.00 N: 624435.00
Location: Tweedsmuir	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 1.00	C	0.00 - 1.00	Recovery = 100%	1.60			Brown fibrous PEAT. (H3), (B3).
	1.00 - 2.00	C	1.00 - 2.00	Recovery = 100%	2.00			Brown fibrous PEAT. Frequent plant fibres throughout. (H4), (B3).
								Peat Core Complete at 2.00m

Remarks:

Peat Core Log

Hole No.
PC04
Sheet 1 of 1

Project: Oliver Forest Wind Farm	Client: Oliver Forest Wind Farm Ltd		Dates: 13-12-2023
Project No: 405.064770.00001	Logger: CR	Approved By: RW	Coordinates: E: 308333.00 N: 624371.00
Location: Tweedsmuir	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 1.00				0.80			Dark brown fibrous PEAT. (H3), (B4).
					0.90			Dark brown fibrous PEAT. (H3), (B4).
	1	C	0.00 - 1.00	Recovery = 100%	1.00			Dense grey slightly silty gravelly medium SAND.
								Peat Core Complete at 1.00m
	2							
	3							
	4							

Remarks:

Peat Core Log

Hole No.
PC05
Sheet 1 of 1

Project: Oliver Forest Wind Farm	Client: Oliver Forest Wind Farm Ltd		Dates: 13-12-2023
Project No: 405.064770.00001	Logger: CR	Approved By: RW	Coordinates: E: 307739.00 N: 624317.00
Location: Tweedsmuir	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 0.80	C	0.00 - 0.80	Recovery = 100%	0.80			Brown fibrous PEAT. (H3), (B3).
								Peat Core Complete at 0.80m

Remarks:

Peat Core Log

Hole No.
PC06
Sheet 1 of 1

Project: Oliver Forest Wind Farm	Client: Oliver Forest Wind Farm Ltd		Dates: 13-12-2023
Project No: 405.064770.00001	Logger: CR	Approved By: RW	Coordinates: E: 307497.00 N: 624028.00
Location: Tweedsmuir	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 1.00				0.50			Brown fibrous PEAT. (H2), (B3).
					0.85			Brown fibrous PEAT. (H3), (B3).
					0.95			Dense grey slightly silty gravelly SAND.
	1	C	0.00 - 1.00	Recovery = 100%	1.00			Dense orange slightly gravelly SAND.
								Peat Core Complete at 1.00m
	2							
	3							
	4							
								5

Remarks:

Peat Auger 1
0 – 1.0m

Peat Auger 1
1.0 – 2.0m

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Peat Auger 2
0 – 1.0m

Peat Auger 3
0 – 1.0m

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Peat Auger 3
1.0 – 2.0m

Peat Auger 4
0 – 1.0m

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Peat Auger 5
0 – 1.0m

Peat Auger 6
0 – 1.0m

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FIGURES