Tom na Clach Wind Farm Extension
Appendix 13.C: Outline Peat Management Plan

for

Nan Clach Extension Limited

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Appendix 13.C: Outline Peat Management Plan
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1 Introduction

This outline Peat Management Plan (PMP) document has been prepared by Fluid Environmental Consulting (Fluid) on behalf of Nan Clach Extension Limited, the Applicant, for the proposed Tom na Clach Wind Farm Extension (the 'Proposed Development') located about 20km southeast of Inverness, Scotland. The document forms Appendix 13.C of the Hydrology, Hydrogeology and Geology chapter to the Environmental Impact Assessment Report (EIA).

The site boundary for the Proposed Development covers an area of about 4.0km^2. The infrastructure of the final layout will adjoin the existing tracks that were constructed for the operational Tom nan Clach wind farm (the 'Operational Scheme'). It is comprised of 4km of tracks that will be constructed, of which 2.5km will be excavated and 1.5km will be floated, seven wind turbine locations, a construction compound, a substation/control building/battery energy storage system and a borrow pit. The total area of the wind farm infrastructure footprint final layout is 123,378 m^2. The area of excavation is slightly different, as there is an additional excavated area to allow for 2 in 1 side batters and side drains. The area for floating track is then excluded as it is not excavated.

The PMP will be further developed and implemented subsequent to the Proposed Development receiving consent from the Scottish Government. Further details and specific plans will be determined during the detailed design process and once further site investigations have been undertaken. These details will then be included in a detailed PMP as a part of the Contractor's detailed Construction and Decommissioning Environmental Management Plan (CDEMP). The responsibility for the implementation of the PMP will be with the Principal Contractor (PC).

The PMP has been developed due to identification of the presence of peatland and peat habitats on the Proposed Development site (Chapter 11, Ecology, of the EIA Report), and should be read in conjunction with the Tom na Clach Wind Farm Peat Survey Report (February 2022) included as Appendix 13.B of the Hydrology, Hydrogeology and Geology chapter to the EIA Report.

The potential volumes of peat extracted and re-used have been calculated based on an area specific or infrastructure specific basis using a modelled peat contour plan developed on a high-density probing grid where excavations will be undertaken. This has allowed high levels of confidence in the estimation of the volumes of peat that will be excavated and that will then require appropriate re-use.

The PMP addresses the management of peat during the construction period for the windfarm and the restoration of the site once construction has been completed.

2 Objectives

The PMP has been developed to demonstrate that peat has been appropriately considered and protected during the design phase of Proposed Development and, should consent be granted, will be carefully managed and preserved throughout

the construction and operation periods. The PMP aims to propose mitigation measures that will minimise any impacts, and the long-term habitat restoration and management plans for key areas of the site are designed to enhance the site.

The PMP outlines the overall approach of minimisation of peatland disruption that has been adopted. It aims to demonstrate that, where practical, all further opportunities to minimise peat disturbance and extraction will be taken.

The PMP seeks to identify that appropriate proposals to reuse surplus peat can be accommodated within the site layout, without significant environmental or health and safety implications, to minimise risk in terms of carbon release and human health.

3 Structure

The structure of the PMP is as follows:

- Legislation, policy, and guidance;
- Role of the peat management plan;
- Definition of peat, details of peatland characteristics and peat conditions on site;
- Avoidance and minimisation of peat disturbance;
- Peat balance between excavation and reuse on site of surplus peat;
- Peat excavation and handling methods / controls and temporary peat storage; and,
- Reuse in infrastructure construction restoration and in habitat enhancement.

Tables are included showing:

- a summary of depth of penetration probe data;
- a summary of interpreted peat depth at infrastructure areas;
- a summary of dimension and area details of the infrastructure;
- where excavated peat will be generated and the associated quantities;
- where excavated peat will be re-used and the associated quantities; and,
- a summary of the peat extraction and re-use balance.

4 Legislation, Policy and Guidance for Peat Management

4.1 Legislation Policy and Guidance

When considered as part of a carbon landscape, peat has a capacity to act as a carbon sink. The management of peat therefore has implications for carbon

emissions and climate change. There is a substantial body of legislation and guidance regarding climate change and carbon which is relevant to the management of peat including:

- The UK Climate Change Act (2008);
- *The Carbon and Water Guidelines.* Carbon Landscapes and Drainage, 2012 www.clad.ac.uk; and
- Forestry Commission, 2011, 'Forests and climate change: UK Forestry Standard Guidelines.

Other key documents relied upon to inform this outline PMP include:

- *Scotland's National Peatland Plan Working for our future*. Scottish Natural Heritage, 2015;
- *Peatland Survey: Guidance on Developments on Peatland*. Scottish Government, Scottish Natural Heritage, SEPA, 2017;
- *Good practice during windfarm construction* (Scottish Renewables, SNH, SEPA & Forestry Commission Scotland, 4th Edition 2019)*;*
- *Scottish Environment Protection Agency Guidance: Developments on Peatland – Site Surveys*. SEPA, 2013;
- *SEPA Regulatory Position Statement – Developments on Peat*. February 2010;
- *Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste*. Scottish Renewables, 17 January 2012;
- *Floating Roads on Peat: A Report into Good Practice in Design, Construction and Use of Floating Roads in Peat with particular reference to Windfarm Developments in Scotland*. Forestry Civil Engineering and SNH, 2010.
- *Forestry Commission (2012).* Forests & Water Guidelines. 5th Edition. HMSO;
- *Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments*. Scottish Executive, 2006;
- *Peat Slide Hazards and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments*. Scottish Executive, 2017;
- *Towards an assessment of the state of UK Peatlands.* JNCC, 2010; and
- *Draft Peatland and Energy Policy Statement*. SNH, July 2016.

4.2 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 and Decommissioning Environmental Management Plan (CDEMP) as follows:

4.2.1 Stage 1: Environmental Impact Assessment (EIA)

It is necessary to show how, through site investigation and iterative design, the Proposed Development has been designed to minimise, so far as reasonably practicable, the quantity of peat which will be excavated; that volumes of peat anticipated to be excavated by the Proposed Development have been considered; and how excavated peat will be managed. The overall aim is to minimise the impacts associated with excavation of peat by using the following hierarchy of design principles: prevent excavation; reduce volumes of peat excavated; and reuse excavated peat in a manner to which it is suited. This hierarchical approach comprises:

1. Initial assessment of peat coverage on site based on broad 100m grid;
2. Design of layout based on various constraints including peat occurrence on site;
3. Further detailed site surveys undertaken to obtain peat depth across the proposed layout and micro-siting allowance and iteration as necessary;
4. Calculation of estimated volumes of excavated peat and potential reuse volume requirements based upon the proposed site design / layout;
5. Determine whether there is likely to be negative or positive overall peat balance, and whether the generation of excess material can be avoided, and, if not, where reductions in the volumes of excavated materials may be achieved;
6. Site layout is refined to avoid areas of deeper peat and hence reduce carbon impacts of the project construction activities;
7. Further surveys undertaken if required in new sections of infrastructure;
8. Record specific examples of how overriding principles of prevention and minimisation of peat disturbance are to be taken into account in the design of the site;
9. The assessment is to be consistent with and feed into the peat stability and carbon payback assessment; and
10. Identify limitations and make recommendations for further site investigation (post-consent) in order to steer detailed design and micro-siting such that opportunities for further reductions in excavated peat volumes can be implemented where possible.

4.2.2 Stage 2: Post Consent / Pre-Construction

As part of the EIA it will have been demonstrated that, on the basis of the investigation and data gathered, 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 and refined post planning consent, and prior to the relevant works commencing, as a consequence of any further or

more detailed ground investigation or survey works required to inform detailed design, or that may be required under planning consent conditions.

4.2.3 Stage 3: Construction Stage

Actual peat volumes excavated during construction will be recorded against the overall predicted volumes provided in Tables 5 and 6 of this PMP. Within micro-siting allowances, the alignment and design of tracks, hardstanding orientation and construction methods will be reviewed to avoid/minimise peat disturbance as much as possible in light of the more detailed information available once construction actually commences. A regular review and update of the peat mass balance table will be undertaken by the appointed Contractor and monitored by the Ecological Clerk of Works (ECoW) on site, and made available to regulators as required.

5 Peat Conditions

5.1 Definitions of Peat

Organic material less than 0.5m depth is not defined as peat. This is in accordance with guidance from:

- The Soil Survey of Scotland (1984) defines peat as *'the organic layer or layers exceeding 50cm depth from the soil surface and with an organic matter content of greater than 60 %';*
- The Forestry Commission use 45cm as the critical depth for peat to occur (*Understanding the GHG implications of Forestry on Peat Soils in Scotland,* 2010);
- The Macaulay Land Use Research Institute define shallow peat as having 'a prescribed depth of organic matter of 50 – 100cm'; and
- *Developments on Peatland: Site Surveys,* SNH, SEPA, Scottish Government and The James Hutton Institute 2104.

Deep peat is classified within:

- Scottish Government Guidance. *Developments on Peatland: Site Surveys* 'Deep Peat: a peat soil with a surface organic layer greater than 1.0m deep'.

Shallow peat can therefore be classified as organic material between 0.5m and 1.0m in depth with deep peat over 1.0m depth.

Peat can be separated into three main layers: acrotelmic (the upper living layer), catotelmic (the middle to lower layer) and occasionally amorphous (lower layer) peat:

- Acrotelmic peat is the living layer of the peat including the peat turf or turve being a thin, floating vegetation mat layer. The acrotelm is generally found within the top layer of peat (often less than 0.5 m) depending on the degree of decomposition and fibrous nature of the peat (approximately H1 to H5 on

the Von Post classification scale). The acrotelm is generally of high permeability, decreasing with depth. The water table fluctuates in this layer and conditions vary from aerobic to anaerobic. Material may be fibrous or pseudofibrous (plant remains recognisable), spongy, and when excavated strength is lost but retains integral structure and can stand unsupported when stockpiled >1m.

- Catotelmic peat is the dead layer of peat found deeper than acrotelmic peat which has some remnant plant structures. Material has high water content and is permanently below the water table (saturated) therefore organic matter decomposes anaerobically. Some plant structures may be recognisable but are highly humified losing most of their characteristics (approximately H6 to H8 on the Von Post classification scale) and strength. Water flow through the catotelm is slow unless peat structures such as sink holes or peat pipes are present.
- Amorphous peat is highly decomposed organic material where all recognisable plant remains are absent (approximately H9 to H10 in the Von Post classification scale). These deposits are dark brown to black in colour, plastic, are low tensile strength and are unable to stand unsupported >1 m when stockpiled.

5.2 Peat Conditions on Site

5.2.1 Desk Based Review

The site was assessed for peat vegetation through desktop review of maps and plans, a number of site walkovers by ecologists and hydrologists, and intrusive site investigation in terms of extensive peat depth probing and coring across the wind farm site and infrastructure locations including access track routes.

Just over 50% of the proposed wind farm infrastructure is underlain by peat, with areas of deep peat (>1m), totalling an area of 30.5% of the site infrastructure.

5.2.2 Peat Surveying Methodology

To obtain a detailed understanding of the spatial and depth distribution of peat and its properties, a series of tasks have been completed which include:

- Peatland habitat mapping;
- Depth penetration probing in a 100m grid over the entire wind farm site;
- Higher frequency of depth penetration probing at all infrastructure and track locations:
    - Track – every 50m with 10m offset to either side of track;

- Turbine base and crane hardstanding – 10m grid on the footprint of the turbine base and crane hardstanding and on a 20m grid in the surrounding 50m micro-siting area; and
- 10m grid for the footprint of all other infrastructure and a 20m grid in the surrounding 50m micro-siting area.

- Coring in two campaigns with a total of 19 cores obtained;
- Development of a depth of penetration map to indicate the maximum depth of probe penetration at all investigation points across the site;
- Development of an interpreted maximum depth of peat contour map to indicate the potential peat depth based on the depth penetration probing results and verified by coring;
- Examination of the variability of the depth of the acrotelm, the thickness of the catotelm and the thickness of amorphous peat;
- Calculation of the maximum potential peat volumes that will be removed due to excavation for infrastructure based on the depth penetration probing results; and
- Examination of areas where peat will be reused to allow calculation of reuse volumes.

5.2.3 Peat Surveys

Peat surveys were undertaken in two phases, commencing in November 2020.

Phase 1

- Complete depth of penetration probing on a grid of 100m spacing across the full site boundary of 4.0km^2 where probing data was not already available from the previous campaign for the Operational Scheme. This resulted in 202 probes – Figure 1 of Appendix 13.B: Peat Survey Report.
- Completion of coring in 10 locations.

These data were presented in figures and as shapefiles in order for the infrastructure layout to be designed in accordance with the site constraints.

Phase 2

- Complete depth of penetration probing across the proposed infrastructure layout at the following locations:
  - along all sections of proposed new access tracks at 50m intervals with 10m offset probes;
  - at all seven turbine bases and associated crane hardstanding on a 10m grid and in a 50m buffer on a 20m grid;
  - at the construction compound (area of 150m x 100m) on a 10m grid;
  - at the borrow pit search area (area of 128m x 267m) on a 10m grid; and

- at the substation (100m x 50m) on a 10m grid.
- This specification provided a total of a further 3,531 probes which were undertaken over three campaigns as the infrastructure layout was optimised.

- Complete coring in a further 9 locations.

The total number of locations monitored for both phases is 3,733 probes and 19 cores and are presented in Figure 13.9 of the EIA Report.

For all these phases the following tasks were required to be completed:

- Record the depth of penetration at each probe location along with an estimate of the geology at the limit of penetration;
- Collect data from cores on total peat depth, Von Post measurements every metre, the thickness of the acrotelm, catotelm and amorphous peat, the underlying geology and comments on water table if possible;
- Take a photographic record of all cores;
- Present all data in tables with appropriate labelling of locations according to the specification document;
- Provide a peat depth contour plan across the area of probing and coring; and
- Provide a factual report detailing the work completed and the data collected.

An updated peat depth contour plan was constructed in Figure 13.10 of the EIA Report to show all peat probe locations in relation to the infrastructure and was used to inform design changes including track amendments and final construction compound, substation and borrow pit locations.

5.2.4 Peat Survey Results

A total of 3,733 probes were undertaken across the site with each probe recording the depth of penetration and the potential substrate at the limit of penetration (Appendix 13.2).

Of the 3,733 locations probed a total of 1,713 probes (45.9%) recorded depths of 0.5m or less and 1,125 probes (30.1%) recorded depths greater than 1m (deep peat) as shown in Table 1.

Table 1 Peat Penetration Depth across the Site

Depth Range (m)	Number of Probes	Percentage of Probes
0 to 0.5 (no peat)	1,713	45.9%
>0. 5 – 1.0	893	23.9%
>1.0 – 1.5	399	10.7%
>1.5 – 2.0	371	9.94%
>2.0 – 3.0	173	4.63%
>3.0 – 4.0	111	2.97%
>4.0 – 5.0	63	1.69%

Depth Range (m)	Number of Probes	Percentage of Probes
>5.0	8	0.21%
Total	**3,733**	**100%**

The total area of the proposed windfarm infrastructure footprint is about 12.34ha. Across about half of the area of infrastructure, 48.5%, the peat depth is less than 0.5m in depth and therefore not considered to be located on peat deposits. A total of 20.4% of the infrastructure is located on peat between 0.5m and 1.0m, classified as peat but not as deep peat. Deep peat, probe depths greater than 1.0m, was identified at 31.1% of the infrastructure.

A total of 6.35ha of the infrastructure (51.5%) is therefore located on peat, of which 3.83ha (31.1%) is located on deep peat.

Table 2 Peat Penetration Depth across the Infrastructure

Depth Range (m)	Area of infrastructure footprint (m^2)	Area of infrastructure footprint (%)
0 to 0.5 (no peat)	59,846	48.51%
>0. 5 – 1.0	25,184	20.41%
>1.0 – 1.5	16,191	13.12%
>1.5 – 2.0	11,485	9.31%
>2.0 - 2.5	7,418	6.01%
>2.5 - 3.0	2,605	2.11%
>3.0 - 3.5	618	0.50%
>3.5 - 4.0	31	0.03%
Total	**123,378**	**100.00%**

Note: These values are different from the actual excavation footprint as the constructed track width will be 5m however the excavated width would be 7m to allow for drainage and batter slopes. In addition, these figures also take into account floating roads.

The deepest depth penetration probes are scattered around the site although they are located within areas of low topographical gradient. The peat survey identified the two types of peat layers (acrotelm and catotelm) within the peat across the site. There was one core where amorphous peat (H9) was identified in the catotelm.

As probe depths of 0.5m or less are not defined as peat, a total of 5 of the total 19 cored locations did not encounter peat. Of the 14 cores that are located on peat, an acrotelm layer (fibrous material present) was encountered at all but two of the locations. It varied in thickness between 0.06m and 0.20m with an average thickness of 0.11m where it was present across the site.

Catotelm peat was encountered in all of the 14 cores with peat depths of greater than 0.5m. The thickness of the catotelm layer varied between 0.35m and 2.10m with an average of 0.94m across the site where peat was present.

These values have been used in calculations of volumes of peat across the site where the peat contour map indicates that peat is present (e.g. >0.5m probe depth).

5.2.5 Habitat Conditions

Phase 1 Habitat survey results and more detailed mapping using the National Vegetation Classification (NVC) standard is detailed within Chapter 11 of the EIA Report. The following summary is taken from Chapter 11:

Under the EU Habitats Directive blanket bog is an Annex 1 priority habitat but only when 'active' (McLeod et al, 2009). 'Active' blanket bog is defined by McLeod et al (2009) as "supporting a significant area of vegetation that is normally peat-forming. Typical species include the important peat-forming species, such as bog-mosses *Sphagnum* spp. and cotton grasses *Eriophorum* spp., or purple moor-grass *Molinia caerulea* in certain circumstances, together with heather and other ericaceous species. Thus sites, particularly those at higher altitude, characterised by extensive erosion features, may still be classed as 'active' if they otherwise support extensive areas of typical bog vegetation, and especially if the erosion gullies show signs of recolonization".

Much of the area of blanket bog on the site is not in good condition. The combination of moor drains, erosion, muirburn and sheep grazing has resulted in this habitat being significantly modified, including the extensive drying of the peat. There are no areas of intact blanket bog vegetation present within the survey area.

Although natural erosion of blanket bog and formation of gullies in stream heads in particular, can occur on healthy blanket bog, the extent of gully formation and peat erosion on the slopes of Tom na Clach is high and bare peat is common. Bog mosses (Sphagnum spp.), the main peat building species, are lacking or present at low frequency within much of the blanket bog on site. Bog pools, which would normally be colonised by a range of bog mosses and cotton grass, are frequently unvegetated.

5.2.6 Peat Characteristics

Samples of peat were observed in the field as part of the peat depth probing programmes and descriptions noted with respect to its characteristics, including fibre content, decomposition and moisture content.

The Von Post test was also carried out at core locations. Von Post scores for the acrotelm ranged between H2 and H4, with an average of H3. A score of H3 is defined by Ekono (1981) (1981) as "*Very slightly decomposed peat which, when squeezed, releases muddy dark brown water, but from which no peat is passed between the fingers. Plant remains are still identifiable, and no amorphous material present.*" This effectively means that there is no amorphous peat in category H3. H scores of 5 or more begin to have amorphous material, with significant amorphous material occurring at scores of H9 and above.

For the catotelm, Von Post scores ranged between H5 and H9, with an average of H7. A score of H7 is defined as "Highly decomposed peat. Contains a lot of

amorphous material with very faintly recognizable plant structure. When squeezed, about one-half of the peat escapes between the fingers. The water, if any is released, is very dark and almost pasty." In terms of reuse, consideration has to be given to the increasingly amorphous and plastic nature of that catotelm with Von Post scores of H7 and above. Only one core identified amorphous peat.

6 Avoidance and Minimisation of Peat Disturbance

6.1 Avoidance

The infrastructure layout has been designed to avoid and minimise the impact on peat habitat. The final iteration of the infrastructure layout was undertaken subsequent to detailed peat probing across all infrastructure which reduced the presence of infrastructure located on deep peat (>1.0m depth) to 30.5% of its footprint.

6.2 Further Minimisation

The disturbance of peat by the construction of the tracks, crane hardstandings and turbine foundations and other infrastructure will be minimised as much as practicably possible, taking into account the other constraints to the development, in order to try and reduce any peat waste on site and reduce potential carbon losses from the peat excavation process.

Throughout the construction process, the appointed contractor will look to minimise the volumes of excavated peat. As far as possible, appropriate handling and storage of excavated materials will be undertaken such that their integrity and subsequent reuse is not jeopardised.

Further measures to minimise peat disturbance will be incorporated in the development and construction process. The principles of waste hierarchy will be adhered to in order to:

- Avoid and/or minimise production of excavated peat;
- Reuse, where possible, excavated peat on site in landscaping and re-profiling works, to minimise visual impacts and to facilitate habitat, ecological and hydrogeological restoration, improvement and enhancement; and
- Avoid waste peat being sent for disposal, recovery and/or reuse off site.

All contractors will be made aware of the sensitivity of peat and wetland habitats and the ECoW will clearly mark sensitive habitats near to construction areas. Contractors will be required to work within the narrowest practical construction corridor when working in or near areas of peat.

All plans and method statements will be accompanied by justification of the final design and/or construction methods identified by the Contractor, including reasons for discounting alternative methods. This is required in order to demonstrate that

all avenues for avoiding hydrological disruption and reducing the disturbance and excavation of peat have been considered.

It is anticipated that an Ecological Clerk of Works (ECoW) will be appointed for the scheme that will:

- Identify areas of sensitive habitat;
- Clearly mark sensitive habitats near to construction areas and make the Principal Contractor aware of the sensitivity of peat habitats and inform all sub-contractors;
- Walk the areas affected by the Proposed Development with engineers before construction commences;
- Authorise minor movement of infrastructure within the micro-siting available where impact can be reduced; and
- Monitor that any micro-siting does not result in movements into more sensitive habitats and deep peats unless unavoidable.

7 Peat Excavation Areas and Assumptions

The Proposed Development infrastructure dimensions are summarised in Table 3 and Table 4 and are based on the Proposed Development layout GIS shape files provided.

Table 3 – Infrastructure Dimension Final Layout

Infrastructure	Dimensions	Area (m^2)
Turbine 1 (includes crane hardstanding)	Irregular shape	6,157
Turbine 2 (includes crane hardstanding)	Irregular shape	6,157
Turbine 3 (includes crane hardstanding)	Irregular shape	6,166
Turbine 4 (includes crane hardstanding)	Irregular shape	6,157
Turbine 5 (includes crane hardstanding)	Irregular shape	6,155
Turbine 6 (includes crane hardstanding)	Irregular shape	6,152
Turbine 7 (includes crane hardstanding)	Irregular shape	6,165
Construction Compound	100m x 150m	14,928
Substation	100m x 150m	14,012
Borrow Pit	128m x 267m	34,077

Infrastructure	Dimensions	Area (m^2)
New Track Excavated	Irregular shape	10,372
New Track Floated	Irregular shape	6,882
Total		**123,378**

There are areas outside of the footprint that will also be excavated which are presented in Table 4 and based on the following assumptions:

7.1 Excavated Tracks

- 0.5m deep V drains with 2 to 1 batters will be installed alongside excavated tracks which will increase the width of the excavated base from 5m to 7m; and
- slope batters will be installed along the 7m excavated width on a 2 in 1 gradient, extending the footprint to about 11m wide depending on peat depth.

The peat volume excavated therefore includes all the peat within the 5m width over the total length of excavated track plus the amount of peat extracted from the V drain and the slope batter.

7.2 Floated Tracks

- It is assumed that floated tracks will be elevated above ground level by up to 1m. Slopes will be installed either side of the 5m wide tracks on 2 in 1 slopes, therefore they will extend the floating track about 2m on either side (9m total track width).
- V drains will be installed either side of the track at 0.5m length of each V.

7.3 Temporary Construction Compound

- There is no peat within the proposed construction compound area; and
- V drains will be installed on all sides of the construction compound at 0.5m depth, with a 2 to 1 batter for each V.

7.4 Turbine Foundations

- Turbine foundations will be backfilled with concrete. The areas outside of this footprint will have sloped sides for construction. Where these adjoin the crane hardstanding they will be filled with hardcore. Where these adjoin the surrounding habitat, they will be backfilled with the material removed.
- V drains will be installed on the side of the turbine foundations not connected to the crane hardstandings 0.5m depth, with a 2 to 1 batter for each V.

7.5 Crane Hardstandings

- The excavated crane hardstanding areas will have slope batters installed along the perimeter on a 2 in 1 gradient to ground level where the excavation is below the surrounding ground.
- V drains will be installed on all sides of the crane hardstandings at 0.5m length of each V.

7.6 Substation

- The majority of the substation area will be floated with only a minor part excavated for the substation structure; and
- V drains will be installed on all sides of the substation at 0.5m depth, with a 2 to 1 batter for each V.

7.7 Borrow Pit Search Area

- The borrow pit will be excavated with a perimeter diversion V ditch on all sides of the borrow pit at 0.5m length of each V.

The windfarm infrastructure and dimensions used in the peat balance calculations are summarised in Table 4. These relate to the actual excavated dimensions related to peat.

It is assumed that any peat excavated for cable trenches is stored adjacent to the trench while the track is laid and then replaced, therefore this volume is not applicable to the excavated or reuse volume.

Table 4 – Infrastructure Additional Dimensions

Infrastructure	Dimensions	Area (m^2)
Turbine 1 (includes crane hardstanding)	2 in 1 excavation around free perimeter of 473m on peat, plus 0.5m V drains	1,438
Turbine 2 (includes crane hardstanding)	2 in 1 excavation around free perimeter of 271m on peat, plus 0.5m V drains	387
Turbine 3 (includes crane hardstanding)	2 in 1 excavation around free perimeter of 437m on peat, plus 0.5m V drains	912
Turbine 4 (includes crane hardstanding)	2 in 1 excavation around free perimeter of 503m on peat, plus 0.5m V drains	1,177
Turbine 5 (includes crane hardstanding)	2 in 1 excavation around free perimeter of 487m on peat, plus 0.5m V drains	1,498
Turbine 6 (includes crane hardstanding)	2 in 1 excavation around free perimeter of 117m on peat, plus 0.5m V drains	257

Infrastructure	Dimensions	Area (m^2)
Turbine 7 (includes crane hardstanding)	2 in 1 excavation around free perimeter of 220m on peat, plus 0.5m V drains	397
Construction Compound	2 in 1 excavation around free perimeter of 187m on peat, plus 0.5m V drains	370
Substation (excavated)	Within floated substation area so no additional area required	0
Substation (floated)	2 in 1 slope back to ground level	1,668
Borrow Pit	2 in 1 slope back to ground level around free perimeter of 8m, plus 0.5m V drains	15
New Track Excavated	1m wider than footprint on each side of track for drainage and 2 in 1 slope back to ground level along free perimeter of 1,969m	6,840
New Track Floated	0.5m V drains	1,586
Total		**17,149**

8 Excavation and Reuse Volume Estimates and Reuse Requirements

8.1 Excavated Volumes

Peat excavation volumes associated with the project have been calculated using the GIS package ArcGIS based on the following data and assumptions:

- A contour map of assumed peat depth based on interpolation of values from probing across the site;
- Dimensions of the proposed areas for excavation for site infrastructure based on the layout shape files provided;
- An estimated acrotelm depth of 0.11m across infrastructure area where peat (>0.5 m organic soil) is present based on the peat core data;
- An estimated catotelm thickness of the average depth of the peat minus the acrotelm (0.11m) across infrastructure areas where peat is present, and based on the peat core data;
- Minimal occurrence of amorphous peat; and,

- An assumption that the probe depth is representative of the actual depth of the peat (validated by a spatial coverage or cores and detailed in Appendix 13.B Peat Survey Report).

The contoured surface of the peat created has been used to determine the average depth of peat under the excavation footprint of all proposed infrastructure and therefore the total volume of peat to be excavated as well as the volume of acrotelmic and catotelmic peat. This data is presented in Tables 5 and 6.

The peat volume estimates have been calculated to take into account the wind farm layout and additional extraction volumes as per Table 4.

The total calculated excavation volume estimates are:

- Total volume of peat which will be excavated = 64,121m^3;
- Total volume of acrotelm which will be excavated = 7,279m^3; and
- Total volume of catotelm which will be excavated = 56,842m^3.

These values are estimates based on the available data and the above assumptions.

A bulking factor of 10% is applied to these values which increases them to:

- Total volume of peat once excavated = 70,533m^3;
- Total volume of acrotelm once excavated = 8,007m^3; and
- Total volume of catotelm once excavated = 62,526m^3.

In order to further determine accurate peat volumes, further peat probing and / or other ground investigation techniques will be employed as necessary prior to and during the works in order to inform micro-siting requirements.

Final implementation of peat reuse and classification will be subject to geotechnical on-site tests e.g. shear vane testing, to determine peat stability and type and use potential.

Table 5 – Excavated Peat Volumes Based on Actual Footprint

Infrastructure	Infrastructure area (m^2)	Average peat depth over infrastructure area (m)	Percentage of infrastructure with >0.5m depth of peat	Area of infrastructure with >0.5m depth of peat (m^2)	Average peat depth over area of infrastructure with >0.5m depth of peat (m)	Volume of peat excavated (m^3)	Volume of acrotelm peat excavated (m^3)	Volume of catotelm peat excavated (m^3)
Turbine 1 (incl. hardstanding)	6,157	1.43	91.9	91.9	1.52	8,599	679	7,920
Turbine 2 (incl. hardstanding)	6,157	0.57	57.9	57.9	0.71	2,548	428	2,120
Turbine 3 (incl. hardstanding)	6,166	0.85	71.5	71.5	1.04	4,601	529	4,072
Turbine 4 (incl. hardstanding)	6,157	1.17	99.4	99.4	1.17	7,158	734	6,423
Turbine 5 (incl. hardstanding)	6,155	1.52	98.3	98.3	1.54	9,306	726	8,580
Turbine 6 (incl. hardstanding)	6,152	0.51	30.6	30.6	1.10	2,064	226	1,838
Turbine 7 (incl. hardstanding)	6,165	0.67	62.1	62.1	0.91	3,467	460	3,008
Construction Compound	14,928	0.55	37.6	37.6	0.99	5,562	673	4,888

Infrastructure	Infrastructure area (m^2)	Average peat depth over infrastructure area (m)	Percentage of infrastructure with >0.5m depth of peat	Area of infrastructure with >0.5m depth of peat (m^2)	Average peat depth over area of infrastructure with >0.5m depth of peat (m)	Volume of peat excavated (m^3)	Volume of acrotelm peat excavated (m^3)	Volume of catotelm peat excavated (m^3)
Substation (Excavated)	1,979	1.96	100.0	100.0	1.96	3,879	237	3,641
Substation (Floated)	12,033	1.65	99.1	99.1	1.66	0	0	0
Borrow Pit	34,077	0.11	0.2	0.2	0.57	35	7	27
New Track Excavated	10,372	0.93	57.0	57.0	1.38	8,163	709	7,454
New Track Floated	6,882	1.29	95.0	95.0	1.34	0	0	0
Total	**123,378**					**55,380**	**5,408**	**49,971**

Table 6 – Excavated Peat Volumes Based on Additional Areas

Infrastructure	Free perimeter on peat (m)	Volume of peat excavated from drains and side slopes (m^3)	Volume of acrotelm peat excavated (m^3)	Volume of catotelm peat excavated (m^3)
Turbine 1 (incl. hardstanding)	473	1152	192	960
Turbine 2 (incl. hardstanding)	271	172	62	110
Turbine 3 (incl. hardstanding)	437	530	132	399
Turbine 4 (incl. hardstanding)	503	751	165	586
Turbine 5 (incl. hardstanding)	487	1214	200	1014
Turbine 6 (incl. hardstanding)	117	156	37	119
Turbine 7 (incl. hardstanding)	220	207	59	148
Construction Compound	187	207	54	153
Substation	0	0	0	0
Borrow Pit	503	63	42	21
New Track Excavated	8	4	2	2
New Track Floated	1969	4006	739	3266
Total	**7,409**	**8,741**	**1,871**	**6,870**

8.2 Peat Reuse Volumes

From Tables 5 and 6 above, the volume of peat that will be removed by excavation of the infrastructure is ~7,280m^3 of acrotelm, and ~56,840m^3 of catotelm. This volume of peat will be reused around the site in the following areas, as detailed in Table 7:

- In appropriate locations around the infrastructure perimeter such as track verges, the edges of crane hardstandings and the edge of the substation in a 1m wide strip at a thickness of about 0.3m where the infrastructure is located in a peat area. This should essentially be the reinstatement of excavated peat turfs and tie in with the adjacent peat as presented on Figure 9 of the EIA Report. The length of the infrastructure coincident with peat as defined by the peat contour mapping has been calculated at 7,409m.
- For reinstatement of the construction compound over the 14,928m2 area. The area has already been partly worked previously and peat depths are variable but a 1m thickness of peat will be reinstated across the whole of the area to connect to adjacent peat habitat.
- For reinstatement of the borrow pit that occupies an area of 34,077m^2. This has also been worked previously and peat is present around the edge of the worked area. Peat will be placed here at a 1m depth to tie in to the existing peat habitat and allow this area to be restored.
- A total of 19 areas of degraded peat have been identified for peat restoration that comprise a combined total of 23,860m^2 and will be restored with 0.5m or 1m depths of peat.

Table 7 Estimated Potential Reuse Volumes

Reuse Type	Reuse Summary	Acrotelm volume (m^3)	Catotelm volume (m^3)	Total Volume (m^3)
Turbine 1 (incl. hardstanding)	Includes 2 in 1 excavated slope and drain of 0.5x0.5 on V, both around free perimeter, where peat is present	173	259	431
Turbine 2 (incl. hardstanding)	Includes 2 in 1 excavated slope and drain of 0.5x0.5 on V, both around free perimeter, where peat is present	46	70	116
Turbine 3 (incl. hardstanding)	Includes 2 in 1 excavated slope and drain of 0.5x0.5 on V, both around free perimeter, where peat is present	109	164	273
Turbine 4 (incl. hardstanding)	Includes 2 in 1 excavated slope and drain of 0.5x0.5 on V, both around free perimeter, where peat is present	141	212	353
Turbine 5 (incl. hardstanding)	Includes 2 in 1 excavated slope and drain of 0.5x0.5 on V, both around free perimeter, where peat is present	180	270	450
Turbine 6 (incl. hardstanding)	Includes 2 in 1 excavated slope and drain of 0.5x0.5 on V, both around free perimeter, where peat is present	31	46	77
Turbine 7 (incl. hardstanding)	Includes 2 in 1 excavated slope and drain of 0.5x0.5 on V, both around free perimeter, where peat is present	48	72	119

Reuse Type	Reuse Summary	Acrotelm volume (m^3)	Catotelm volume (m^3)	Total Volume (m^3)
Construction Compound	1 m thickness of peat across whole of area after construction finished plus drain backfilling	1,821	13,347	15,062
Borrow Pit Search Area	1 m thickness of peat across whole of area after construction finished plus drain backfilling	4,090	29,988	34,078
New Track Excavated (for vehicles)	Where peat is present next to 2 in 1 excavated slope along free perimeter	653	980	1,633
New Track Excavated	Where peat is present next to 2 in 1 excavated slope around free perimeter	653	980	1,633
New Track Floated	Where peat is present next to 2 in 1 floated slope around free perimeter	536	804	1,340
Peat restoration area 1	Degraded peat area to be infilled over an area of 405m^2 to a depth of 0.5m	49	154	203
Peat restoration area 2	Degraded peat area to be infilled over an area of 254m^2 to a depth of 0.5m	30	96	127
Peat restoration area 3	Degraded peat area to be infilled over an area of 684m^2 to a depth of 0.5m	82	260	342
Peat restoration area 4	Degraded peat area to be infilled over an area of 138m^2 to a depth of 0.5m	17	52	69
Peat restoration area 5	Degraded peat area to be infilled over an area of 418m^2 to a depth of 1m	50	367	418
Peat restoration area 6	Degraded peat area to be infilled over an area of 67m^2 to a depth of 0.5m	8	25	33
Peat restoration area 7	Degraded peat area to be infilled over an area of 104m^2 to a depth of 0.5m	13	40	52
Peat restoration area 8	Degraded peat area to be infilled over an area of 1,052m^2 to a depth of 0.5m	126	400	526
Peat restoration area 9	Degraded peat area to be infilled over an area of 2,475m^2 to a depth of 1m	297	2178	2475
Peat restoration area 10	Degraded peat area to be infilled over an area of 5,988m^2 to a depth of 0.5m	719	2275	2994

Reuse Type	Reuse Summary	Acrotelm volume (m^3)	Catotelm volume (m^3)	Total Volume (m^3)
Peat restoration area 11	Degraded peat area to be infilled over an area of 801m^2 to a depth of 0.5m	96	304	401
Peat restoration area 12	Degraded peat area to be infilled over an area of 796m^2 to a depth of 0.5m	95	302	398
Peat restoration area 13	Degraded peat area to be infilled over an area of 1,099m^2 to a depth of 0.5m	132	418	550
Peat restoration area 14	Degraded peat area to be infilled over an area of 933m^2 to a depth of 1m	112	821	933
Peat restoration area 15	Degraded peat area to be infilled over an area of 1,228m^2 to a depth of 1m	147	1081	1228
Peat restoration area 16	Degraded peat area to be infilled over an area of 1,203m^2 to a depth of 1m	144	1059	1203
Peat restoration area 17	Degraded peat area to be infilled over an area of 2,267m^2 to a depth of 1m	272	1995	2267
Peat restoration area 18	Degraded peat area to be infilled over an area of 699m^2 to a depth of 1m	84	615	699
Peat restoration area 19	Degraded peat area to be infilled over an area of 1,828m^2 to a depth of 1m	219	1609	1828
Total		**10,520**	**60,158**	**70,678**

The re-use of the excavated peat has taken a conservative approach in terms of the areas that will be possible to restore and the depths achievable.

8.3 Peat Restoration Areas

The peat on site is generally degraded and is eroding and will continue to do so without intervention. There are numerous gullies of varying size interconnecting to watercourses which are draining the peatlands and transferring peat particles away from the site and into watercourses. Many of these gullies have bare peat and simple reprofiling to reduce erosion is unlikely to be sufficient in many cases.

Areas that are close to infrastructure and that are likely to benefit from the placement of peat along with dams to maintain stability have therefore been identified as a positive use of the excavated peat.

In many locations damming structures may be necessary to hold the peat in place, however some of the new infrastructure will also offer barriers to movement e.g. Turbine 5 and associated crane hardstanding for peat restoration area 9 and the track sections adjacent to peat restoration areas 2 and 3.

Areas 1 and 2


In this area the vegetated layer will be carefully removed for subsequent reinstatement over the catotelmic peat that will be placed in the gully.

Areas 3 and 4

The approach in this area will be mixed due to the different conditions as acrotelmic peat is present in some of the eroded gullies in other area erosion has reached the underlying substrate.

Areas 5, 6, 7 and 8


Infilling peat in these areas will ideally produce a smoother surface so that groundwater levels can recover and erosion will be significantly reduced.

Area 9


This large eroded area will benefit from stabilisation through peat placement, reprofiling and reduction of erosion which is causing a significant detrimental impact on the adjacent peat.

Area 10, 11, 12 and 13




There are a variety of bare areas and more eroded areas around Turbine 7. Some will require removal and replacement of the slumped acrotelm layer and other peat placement with structures to hold the peat in place along with some reprofiling.

Area 14, 15, 16, 17 and 18


Deeper gully erosion is present in these areas so will benefit from infilling

Area 19

A channel has developed in this area and is leading to erosion and dewatering of the adjacent peat.

8.4 Net Peat Balance

The total volume of peat predicted to be excavated does not exceed the potential reuse volume so there will not need to be disposal of excess peat off-site. The excavated peat volumes and volumes of peat to be re-used are summarised in Table 8 below. The peat restoration areas have only highlighted a small number of the potential areas on site and if successful there are likely to be more opportunities to increase the peat reuse volumes.

Table 8 Net Peat Balance

	Acrotelm volume (m^3)	Catotelm / Amorphous volume (m^3)	Total Volume (m^3)
Excavated Peat (including bulking factor)	**8,007**	**62,526**	**70,533**
Peat Reuse	**10,520**	**60,158**	**70,678**
Total Balance	**-2,513**	**2,368**	**145**

This table shows that overall there is a peat balance between the amount of peat excavated and reused. It is also apparently that there are more opportunities for peat reuse on site due to the degraded and eroded state of the peat, therefore if necessary this can be readily increased on site in conjunction with peat restoration specialists and the ECoW.

Over the life time of the windfarm it is expected that there will be a potential for more peat to be reused on the site than the volume excavated. This will allow the optimum peat restoration programme to be undertaken selecting the best areas for reinstatement.

9 Handling Excavated Materials

9.1 Excavation

The following methodologies for excavation of peat are recommended:

- Areas of peat within the footprint of any excavation will have the top layer of vegetation stripped off as turf prior to construction by an experienced specialist contractor. When excavating areas of peat, excavated turfs should be as intact as possible. Often it is easiest to achieve this by removing large turfs up to 500mm in order to keep the peat intact.
- These turfs should be stored adjacent to the construction area such that they remain moist and viable (see temporary storage below). Excavated turfs should be as intact as possible so as to minimise carbon losses.
- Peat will then be removed, stored separately and kept damp (Carbon and Water Guidelines, 2012). The moisture content of stored/stockpiled peat will be monitored and if it falls below 25% of that in surrounding, intact peat then it will be watered.
- Excavated soils and turfs will be handled so as to avoid cross contamination between distinct horizons and allow reuse potential to be maximised.

- Prior to any excavations, the Contractor will produce a detailed Method Statement identifying where and how excavated peat will be used in reinstatement or landscaping works. Specific requirements for the excavation, handling, storage and reinstatement of peat will be outlined in this Method Statement. The Contractor will consider potential impacts on downstream hydrological receptors and also the potential for instability issues with the excavated material.
- Care will be taken when stripping and removing topsoil and peat turfs and appropriate storage methods used on site, i.e. excavated material will be stored in separate horizons and vegetation rich top layers will be stored vegetation side up.
- Classification of excavated materials will depend on their identified re-use in reinstatement works. At this site it is anticipated that the material to be excavated will comprise peat (which may be sub-divided into turf, acrotelm and catotelm/amorphous), peaty soils and mineral soils (subsoil and topsoil).

9.2 Temporary Storage

Following excavation, peat will be required to be temporarily stored where the material is planned for placement in either the borrow pit or construction compound as these will not be available until after the construction period. Excavated peat will be stored in stockpiles to minimise carbon losses while being stored. Excavated turfs will be stored adjacent to the construction area such that they remain moist and viable.

Areas of temporary storage required for peat will be identified in the Contractor's Method Statement taking into account constraints and mitigation requirements identified in the consolidated supplementary environmental information. This will describe any intended drainage, pollution prevention and material stability mitigation measures that may be required. Initial areas to be considered have been included on Figure 13.11 where gradients are shallow, peat is absent, they are in close proximity to the infrastructure, outside watercourse buffers, GWDTE and areas of peat slide risk. The following general guidelines will apply:

- The appropriate temporary storage areas for excavated peat will be as close to the excavation as practicable and will not be located on deep peat (peat >1.0m).
- The design and location of stockpiles, including incorporated drainage elements, will be agreed with the ECoW and Geotechnical Consultant / Geotechnical Clerk of Works prior to excavation works commencing.
- Temporary peat storage areas should be located ideally on flat areas so that erosion and run off is limited, leachate from the material is controlled, and stability of the existing peatland in the vicinity is not affected.

- Excavated material is to be stockpiled at least 50m away from watercourses. This will prevent the runoff of any wetting required on stored peat and discharge into adjacent watercourses.
- The temporary storage areas should not be located close to any sensitive habitats.
- Any edges of cut peat that may remain exposed, or areas of peat excavation on steep slopes, will be covered with geotextile or similar approved. This will allow re-turfing and re-vegetation and reduce erosion risks.
- Suitable storage areas are more appropriately sited in areas with lower ecological value and low slopes. Cleared areas of forestry are preferred to areas of higher ecological value or areas close to watercourses.
- Temporary peat storage should be in locations where the water table can be kept artificially high.
- An up-gradient cut off ditch should be installed around the edge of the storage bund in order to collect up-gradient surface water runoff and divert water runoff from eroding the toe of the bund.
- It is desirable to keep haul distances of excavated peat as short as possible and as close to intended re-use destinations to minimise plant movements in relation to any earthworks activity, including peat management, in order to minimise the potential impact on the peat structure. It is important that temporary storage is safe and keeps the material suitable for its planned reuse.
- The handling and storage of peat will look to avoid that excavated peat does not lose either its structure or moisture content. Peat turfs require careful storage and wetting to be maintained and to prevent drying out and subsequent oxidisation such that they remain fit for re-use.
- Stockpiling of peat should be in large volumes, taking due regard to potential loading effects. Piles should be bladed off at the side to minimise the available drying surface area.
- Higher piles are more likely to become dewatered, while smaller piles expose a greater area to evaporation. Reducing mound size may also increase likelihood of erosional losses as particulate organic carbon (POC). Overall volumes of stockpiling should be minimised and height and surface areas kept to a minimum.
- Stockpiles should be battered so as to limit instability and erosion and should be bunded using impermeable material. The bunds should extend to a level above the toe of the stockpiled material to provide restraint to surface runoff.
- When planning the temporary storage areas any additional disturbance areas should be minimised.

- Transport of peat to temporary storage areas, restoration areas or designated spoil areas will be by low ground pressure vehicles to avoid excessive compaction of the peat.

10 Reuse of Peat in Infrastructure Restoration

10.1 Bare Peat

There are a number of important methodologies regarding the exposure of bare peat including:

- The amount of time any bare peat will be exposed will be minimised to preserve its integrity.
- The phasing of work should be carried out to minimise the total amount of exposed ground at any one time. By stripping turf and replacing as soon as possible after peat has been re-distributed there will be minimal areas of bare peat.
- Any peat areas on steep ground, or that remains partially bare, will be covered using geotextile or a similar method to stop erosion.
- Any areas of bare peat, where vegetation is not re-growing, will be seeded with a seed mixture obtained from the existing habitat.

This approach has been shown to be effective on other peat sites and the turfs re-grow quickly both establishing vegetation and consolidating the peat. The re-vegetated areas will be monitored. Any areas of bare peat, where vegetation is not re-growing, will be seeded with a seed mixture obtained from the existing habitats on site. Stock exclusion in these areas will continue until vegetation is properly established.

10.2 Infrastructure Re-use

Peat reuse around and within infrastructure areas is an important aspect of the Proposed Development as it allows an opportunity to maintain the integrity of the excavated peat, enhance habitats and create new habitats. This will be undertaken through:

- The Contractor will be required to provide appropriate plant for undertaking all reinstatement works such that no unnecessary disturbance of the ground surface occurs. In order to minimise disturbance and damage to the ground surface, any mobile plant required for reinstatement and landscaping works will be positioned on constructed access tracks, hardstanding areas or existing disturbed areas wherever possible. The use of a long reach excavator for excavations and reinstatement works is preferable as it enables sufficient room to allow initial side casting and subsequent pulling back of turfs over reinstated peat or soil.

- Excavated catotelm or amorphous peat will only be used in restoration works where the topography allows straight-forward deposition with no pre-treatment or containment measures and without risk to the environment. Suitable scenarios may be present in those disturbed areas where natural topography profile allows such use. A fibrous layer of acrotelm and turf will be placed above any catotelm or amorphous peat reinstated.
- Reinstatement of vegetation will be focused on natural regeneration utilising peat vegetated turfs. To encourage stabilisation and early establishment of vegetation cover, where available, peat turfs (acrotelmic material) or other topsoil and vegetation turfs in keeping with the surrounding vegetation type will be used to provide a dressing for the final surface.
- Consideration should also be given to the impacts of poor drainage control in any areas where peat is used in reinstatement, for instance track verges, reinstatement of construction compounds, etc.
- Any reinstatement and re-profiling proposals will consider, and mitigate against, identified significant risks to environmental receptors. In particular, in areas of replaced peat, water management will be considered in the Contractor's Construction Method Statements to allow an appropriate hydrological regime to be re-established within areas of disturbance. Particular attention will be paid to maintaining hydrological continuity and preventing the creation of preferential subsurface flow paths (for instance within backfilled cable trenches).
- Peat turfs should be replaced on all disturbed areas, including constructed roadside drainage channel embankments where possible.
- When constructing tracks rapid restoration will be undertaken as track construction progresses.
- Immediately following construction some turfs will be replaced along the road edges to allow quicker re-vegetation and to soften the road edges
- Any landscaping or road batters should be limited to the areas of ground already disturbed.
- Track edges, passing places and the crane hardstanding areas on the opposite sides of the access tracks from the turbine bases that are no longer required would be reinstated post construction through the removal of capping material and the reuse of peat turfs. Where peat turfs are used to reinstate track edges this will be done in a manner to allow works to tie in with the surrounding topography, landscape and ground conditions.
- The design and construction of tracks on peat shall be done in such a way so as to reduce impacts on the existing peat hydrology at the site. The built track should allow for the transmittance of water, so natural drainage can be maintained as far as possible.
- The revegetation of temporary hardstanding areas will depend on the identified reinstatement use and associated vegetation character bounding

the areas of restoration, with the aim being to match turfs and topsoil to similar ground conditions. Where appropriate, excess peat turfs, if acrotelm in nature and considered suitable by the ECoW, could be used for screening bunds, landscaping or as part of an HMP in conjunction with reseeding. The seed mix used on site would be agreed with the ECoW and SNH and would use local native species akin to the local ecological baseline.

11 Conclusions

Based on the peat depth, characteristics and distribution investigations undertaken across the development area and the windfarm infrastructure layout, a surplus of peat is not expected to be generated by the Proposed Development. All estimated excavated peat is planned for reuse for restoration work during the construction, post-construction, and decommissioning phases of the windfarm.

Further investigation will be undertaken prior to works commencing to confirm peat depth, distribution and characterisation and to refine the peat restoration areas across the site with they both the ECoW and a peat restoration specialist. The additional survey data will be used to inform any micro-siting, if required and to refine the peat restoration methods e.g dams selection, frequency, peat depth, reprofiling strategy, hydrological management; and the extent of the peat restoration areas. The extensive degraded and eroded peat across the site provides opportunity for significant benefit to the peat habitat which otherwise would continue to degrade and diminish.

The Contractor, monitored by the ECoW, will commit to maintaining a record of actual peat volumes excavated and the subsequent peat reuse to compare the predicted and actual peat volumes. This record during the construction, operation, decommissioning and restoration phases of the wind farm will be made available for review by regulators as and when required.