Parc Ynni Calon y Gwynt Energy Park

APPENDIX 10D: OUTLINE SOIL AND PEAT MANAGEMENT PLAN

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1 INTRODUCTION

1.1 SCOPE & PURPOSE

1.1.1. This Outline Soil and Peat Management Plan (SPMP) has been prepared to inform the Environmental Statement (ES) associated with the construction and operation of Calon y Gwynt Energy Park ("The Proposed Development"). This Outline SPMP has been informed by a comprehensive desktop assessment and site survey, presented in **Appendix 10A Baseline Soil Report (BSR)**. This document provides supporting text and therefore should be read prior to this Outline SPMP.

1.1.2. In addition to the BSR, this Outline SPMP should be read in conjunction with the following documents:

- **Figure 10.5: Soil depth**
- **Chapter 4: Description of the Proposed Development;**
- **Chapter 9: Hydrology;**
- **Chapter 10: Geology and Soils;**
- **Outline Construction and Environmental Management Plan (CEMP).**
- Appendix 9A Flood Consequence Assessment (including Outline Drainage Strategy).

1.1.3. Soils with different textures and structure consequently vary in in their sensitivity and land use capability, and environmental and ecosystem services offered. Losses and degradation of soil can be a consequence of the soil machinery and handling practices used during construction activities.

1.1.4. The purpose of this Outline SPMP is to set out the principles and procedures for good practice soil management, including establishing local resources and sensitivities/constraints, then identifying appropriate soil handling techniques during construction to minimise the adverse effects on the characteristics and quality of the soil resource. These soil handling operations include stripping, handling, storage and reinstatement.

1.1.5. SPMP documentation should be considered a live document throughout the planning process and any future pre-construction and construction phases of works. As such, additional information can be incorporated following detailed site investigations carried out prior to construction, as well as from any discussions with Natural Resources Wales (NRW), Land Quality Advisory Service (LQAS) or other engaged stakeholders throughout the development process. The information can be used in the development of the Final SPMP which will be prepared post-consent, prior to construction.

1.1.6. SPMP documentation shall be updated by the Contractor during the construction programme, as applicable, including lessons learned.

1.2 ROLE OF THE SOIL AND PEAT MANAGEMENT PLAN

1.2.1. The SPMP is intended to be a working document to be used throughout the key stages of the design, construction, operation, decommissioning and reinstatement phases of the Proposed Development as part of an overall CEMP.

1.2.2. This Outline SPMP will be submitted as part of the EIA and is referred to as Stage 1 SPMP. From this initial report the SPMP will be developed further into a Stage 2 Pre-Construction SPMP and then a Stage 3 Construction Phase SPMP.

1.2.3. As part of the EIA, the Stage 1 SPMP outlines guidelines on mitigation of any potential disturbance expected from modifying soils present within the Proposed Development. As part of this process, a peat mass balance is presented, which may be further developed prior to the relevant works commencing.

1.2.4. The Stage 2 SPMP will reflect changes to mitigation design following detailed ground investigation or further survey works required under planning consent conditions.

1.2.5. The Stage 3 SPMP will record changes in the mass balance and mitigation design when actual excavated peat volumes are being recorded during construction against the overall predicted volumes. Within micrositing allowances, the alignment and design of tracks, tower foundations and associated construction methods will be reviewed to avoid / minimise peat disturbance as much as possible. This will consider the more detailed information available once construction commences.

1.2.6. 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. This will be made available to regulators as required.

1.3 PLANNING POLICY, LEGISLATION, GUIDANCE AND GOOD PRACTICE

LEGISLATION, POLICY & GUIDANCE

1.3.1. This Outline SPMP has been written with reference to the following good practice guidance documents:

- DEFRA (2009). Construction Code of Practice for the Sustainable Use of Soils on Construction Sites[1];
- The Institute of Quarrying (2021). Good Practice Guide for Handling Soils in Mineral Workings[2];
- Scottish Renewables (SR), Scottish Environmental Protection Agency (SEPA) (2012). Developments on Peatland, version 1[3].
- SEPA - WAS-G-11, On-site Management of Excavated Peat (2026), version 1.[4]

[1] Available at https://assets.publishing.service.gov.uk/media/5b2264ff40f0b634cfb50650/pb13298-code-of-practice-090910.pdf (accessed 15/11/2024)

[2] The Institute of Quarrying (2021). Good Practice Guide for Handling Soils in Mineral Workings. Available at https://885685.fs1.hubspotusercontent-na1.net/hubfs/885685/Soils%20Guidance/IQ%20Soil%20Guidance%20Part%201.pdf (accessed 16/06/2026)

[3] Scottish Renewables (SR), Scottish Environmental Protection Agency (SEPA) (2012). Developments on Peatland, version 1. Available at https://www.gov.scot/publications/assessment-of-peat-volumes-reuse-of-excavated-peat-and-minimisation-of-waste-guidance/ (accessed 16/06/2026)

[4] SEPA WAS-G-11, On-site Management of Excavated Peat (2026), version 1. Available at https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fbeta.sepa.scot%2Fmedia%2Fetmkl4ri%2Fwas-g-11-on-site-management-of-excavated-peat.docx&wdOrigin=BROWSELINK (accessed 16 June 2026)

1.3.2. All other applicable legislation, policy and guidance with respect to soils and peat associated with the proposed development is described in **ES Chapter 10, Geology and Soils**.

1.4 DEFINITION

1.4.1. A definition of peat, peaty soils and other soils is presented in **Appendix 10A Baseline Soils Report (BSR)**.

1.5 APPROACH TO DESIGN

1.5.1. Chapter 6 of Planning Policy Wales (PPW)[5] identifies peatlands as performing important ecosystem services including the storage and sequestration of carbon, reducing flood risk and supporting biodiversity.

1.5.2. In accordance with PPW Chapter 6, in the first instance the infrastructure layout has been informed and evolved applying the Step-Wise approach, seeking to avoid areas identified as high sensitivity soils, as per **Appendix 10A Baseline Soils Report**. This approach then seeks the adoption of a mitigation hierarchy, to minimise impacts, mitigate / restore and then compensate, if required.

1.5.3. It is important to note that peat and soils have been considered alongside a number of other environmental constraints which must be reasonably balanced as the design evolves. The Step-Wise approach to design evolution is summarised below.

STEP 1 - AVOID

1.5.4. The design should seek to entirely avoid irreplaceable habitats, such as peatland, in the first instance.

1.5.5. Where irreplaceable habitats are located within a Site, development should avoid overlap or adverse interaction with marginal areas which might negatively impact their hydrological or ecological function. This should be achieved through iterative surveys and design evolution to identify these constraints and avoid the placement of infrastructure into such areas.

1.5.6. **Section 3** of this Outline SPMP describes how sensitive and irreplaceable habitats, such as peat, have been mostly avoided.

STEP 2 - MINIMISE DISTURBANCE

1.5.7. Where complete avoidance is not possible, the design and methods of construction should seek to minimise the level of disturbance as far as possible.

1.5.8. Embedded design measures include minimising the footprint of working areas and ensuring that all excavated soils can be appropriately re-used locally as part of the reinstatement.

1.5.9. Embedded design measures as well as good practice construction measures to minimise disturbance are described in **Section 3** of this Outline SPMP.

1.5.10. During construction, controls, monitoring and good practice techniques will be pre-agreed with regulators and applied to minimise soil disturbance and/or damage as well as maximise the opportunity for soils to continue functioning. Such measures are described in **Section 5**.

[5] Planning Policy Wales. Available at: https://www.gov.wales/planning-policy-wales (accessed 16 June 2026)

STEP 3 - MITIGATE / RESTORE

1.5.11. In addition to design and construction methods to minimise the impact on soils, a number of further construction related controls and processes would be adopted to mitigate adverse impacts on soil quality as well as to deliver a high standard of soil restoration and aftercare following the completion of construction. As for Step 2, these shall be identified and pre-agreed with regulators.

1.5.12. Good practice techniques have been identified and applied using industry guidance documents and from professional experience from involvement in developments across a range of sectors, these are presented in **Section 5** of this Outline SPMP.

STEP 4 - COMPENSATION ON SITE

1.5.13. Impacts on peat have been almost entirely avoided and therefore on-site (or off-site) compensation is not required.

1.5.14. Nonetheless, the wider Proposed Development Boundary does contain areas of peatland, some of which is in a Modified condition. These areas present an opportunity for peatland restoration, coupled with the construction of the Proposed Development, to improve the quality of the habitats and consequently improve the ecosystem services they offer. Further details are presented in **Section 7**.

1.5.15. Further detail with regard to how the Proposed Development has adopted the Step-Wise approach is set out in the Green Infrastructure Statement, which is submitted alongside this Development of National Significance (DNS) application.

1.6 PROJECT DESCRIPTION

1.6.1. As outlined in **Chapter 4: Description of the Proposed Development**, the Proposed Development comprises the following components:

- 11 wind turbines, each with a three-blade rotor;
- Crane pads and adjacent laydown areas for each turbine location;
- Turbine foundations;
- Access works - including improvements to the existing access and new access tracks;
- Underground power cables linking the turbines to the on-site substation;
- Temporary construction compounds, laydown and storage areas; and
- Grid connection infrastructure, including a Battery Energy Storage System (BESS), on-site substation compound and control building.

1.6.2. The principal point of access is the junction between the A470 and the B4568. Access to the energy park will be provided via a section of new access route and an existing unnamed road. Construction works will be required to the access route, ensuring it is a suitable standard to accommodate construction traffic, including deliveries of concrete, stone, plant, electrical equipment and turbine components.

1.6.3. Ground Investigation (GI) work would be carried out at the pre-construction stage to determine detailed ground conditions to allow for the design of foundations at the construction compound and wind farm substation locations, as well as micro-siting of turbines along with access tracks. This information will support further phases of detailed design work, including refinement of the soil management strategy presented within the Final SPMP prepared post-consent, prior to construction.

2 SUMMARY OF SOIL UNITS

2.1 SOIL TYPES

2.1.1. The baseline soil resource at the Proposed Development is described in **Appendix 10A BSR.**

2.1.2. The Site is dominated by shallow soils and mineral soil profiles. Peat and peaty soils are present but are restricted to isolated pockets rather than forming extensive or continuous deposits. Onsite mineral soil resource can be divided into:

- medium-textured soils comprising silty and sandy clay (used as a loam analogue); and
- heavy-textured soils comprising clay, including organic and/or gravelly clay variants.

2.1.3. Topsoil is generally shallow, with an average depth of 0.21 m. Peat was recorded to an average depth of 0.5 m, with a maximum recorded depth of 0.8 m. Soil probing results support the core data:

- 79.1% of 3,472 probe locations recorded depths less than 0.3 m;
- 85.7% of 2,129 probe locations within 10 m of proposed infrastructure recorded depths less than 0.3 m.

2.1.4. Soils deeper, equal or greater than 0.3 m were localised and generally associated with natural depressions, Flushes, basin features, areas adjacent to watercourses and zones of flow convergence. These deeper and wetter areas generally coincide with mapped areas of potential peat and bog/mire habitat.

2.1.5. Within the Proposed Development, areas of deeper soils are limited to a small number of localised sections, including parts of track south of T03, the access track approaching T04, west of the crane pad at T06 and short sections between T10 and T09.

2.1.6. The data indicate that the Site is located predominantly on shallow mineral soils and avoids the isolated pockets of peat, consistent with the step-wise design approach.

2.2 SOIL CONSIDERATIONS

2.2.1. The identified soil types differ in their susceptibility to erosion and compaction depending on their texture type and is a function of their clay and organic matter content, structural arrangement and water content[6]:

- Medium textured soils with <27% clay content such as silty clay loam, clay loam and sandy clay loam have a medium resilience and will be a moderate risk;
- Heavier soil types such as clay and silt dominated types as well as organic rich soils and peat have a low resilience to damage and consequently at highest risk during handling.

2.2.2. The heavy textured clays and strata containing peat material will be at the highest risk of damage and may be continuously saturated in some locations, particularly near to watercourses or in zones of topographical convergence, following surface flowpaths.

[6] The Institute of Quarrying (2021). Good Practice Guide for Handling Soils in Mineral Workings Available at https://885685.fs1.hubspotusercontent-na1.net/hubfs/885685/Soils%20Guidance/IQ%20Soil%20Guidance%20Part%201.pdf

2.2.3. For this reason, where peat was underlain by clay in a consistent pattern, areas of 'high sensitivity soils' have been identified to inform proposed layout design. An example of how the iterative approach to surveys has influenced the design is illustrated below in **Plate 10D-1**.

2.2.4. The steepness of the slope and slope length can also influence the propensity to erosion, with steep slopes (>12% or > ~6.84 degrees) being at high risk with moderately steep (5% to 12%) and gentle slopes (<5% or < ~2.86 degrees) being at moderate and low risk respectively[7]. Soil erosion will be exacerbated where soil characteristics result in a higher standard percentage runoff.

2.2.5. Damage to soils should be minimised by following the good practice guidance presented in **Section 5**, with close attention paid to the guidance for soil moisture conditions for handling, presented in **Section 5.2**.

[7] DEFRA. 2015. Runoff and soil erosion risk assessment. Available at https://assets.publishing.service.gov.uk/media/5f11b98a3a6f405c0f80ac0a/CS_Runoff_and_Soil_Erosion__CS11_v1.00_.pdf

3 AVOIDANCE (STEP 1)

3.1.1. In accordance with the Step-Wise approach, the infrastructure layout has been iteratively designed to avoid or minimise impact on bog habitats and peat.

3.1.2. This has been achieved through a multiphase campaign (Phase 1, Phase 2 and coring surveys) involving the collection of 3,472 soil probes and 30 soil / peat cores. Site-specific information on soils and peat was an integral design constraint considered throughout the evolution of the Proposed Development layout.

3.1.3. An example of how the iterative approach to surveys has influenced the design is illustrated below in **Plate 10D-1**. Targeted Phase 2 surveys indicated the presence of soils >0.3 m at the track from T10 to T09, located in terraced basins formed on the slope. Based on this information, advice was provided to avoid these more extensive areas of high sensitivity soils (see definition in **Paragraph 2.2.2**). Coring surveys indicated that the soils in these areas were predominantly organic soils underlain by a substantial clay layer, therefore alternative locations in the area to the east were identified. The track access towards T10 was relocated to semi-improved grassland with much thinner light textured soils which are more resilient to soil disturbance and reduced the length of track through high sensitivity soils markedly. Further details on design evolution are presented in **ES Chapter 3 Scheme Need, Alternatives and Iterative Design Process**.

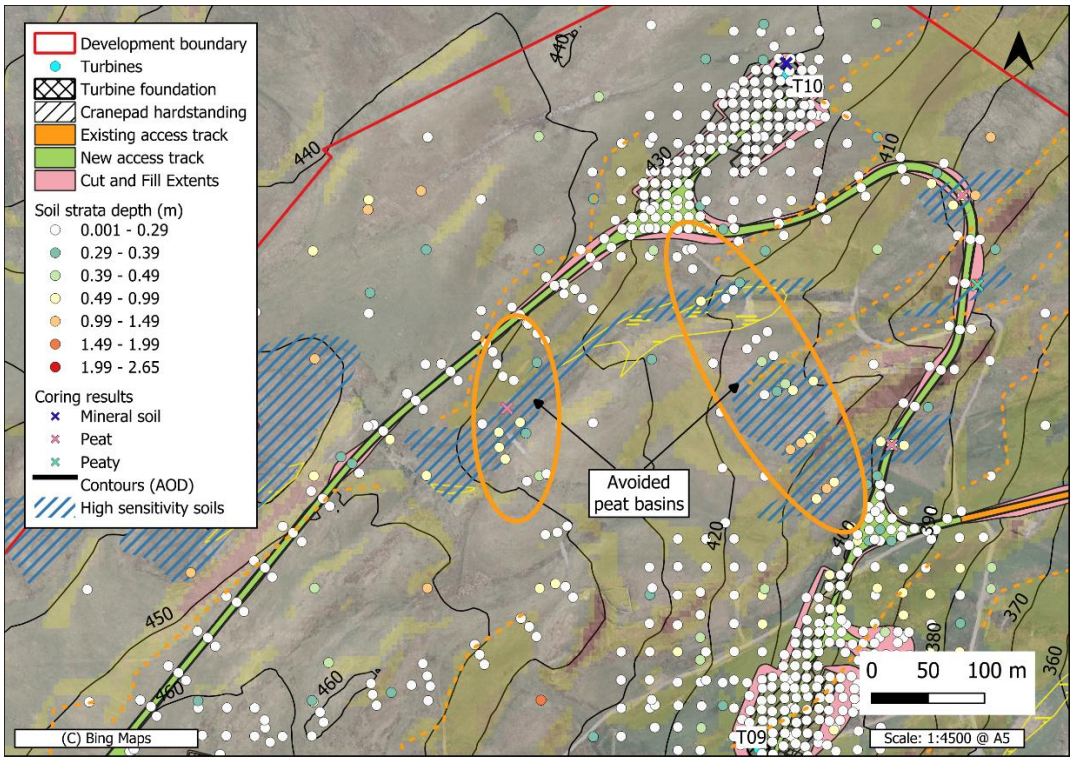

Plate 10D-1 - Illustration of how Soil and Peat Surveys have been used to Prioritise the Avoidance of Areas of High Sensitivity Soils.

3.1.4. The distribution of peat, peaty soils and other soil types are illustrated in Figure 10.5 Peat Depths[8].

3.1.5. Peat was only identified at proposed infrastructure in limited areas of new access track. However, peat is also present directly west of T06, as well as adjacent to sections of tracks approaching T03, T04 and T09. The assessment of aerial imagery has confirmed that areas of high sensitivity soils are unlikely to be adversely affected by the Proposed Development infrastructure due to either lack of hydrological connectivity with terrain on which infrastructure is to be sited, or because embedded mitigation (such as watercourse crossings and cross-drains) are interpreted to be sufficient to preclude noticeable changes in hydrological condition.

3.1.6. In this regard, the proposed infrastructure has been designed to almost entirely avoid high sensitivity soils (including peat), limited to very localised overlap of track alignments with the margins of known peat deposits.

[8] **Figure 10.5 Soil Depths** illustrates measured soil depths alongside soil coring information where soil associations are characterised as peat, peaty soil and other soils. Owing to the highly heterogenous distribution of these soil types, informed by probing, coring and general site observations, no soil depth interpolation has been provided as it is judged that this could lead to the misrepresentation of soil extents, including peat deposits. Areas of peat (peat >0.3 m) are identified as areas of purple hatching. The extent of these areas have been estimated based on soil coring, habitat information and visual site inspection, including professional judgement.

4 MINIMISING DISTURBANCE (STEP 2)

4.1 INTRODUCTION

4.1.1. Embedded design and good practice mitigation will be implemented to minimise disturbance and maximise soil natural capital at the Site. Additional good practice measures are also provided for the effective and sustainable management of all soils, including peaty soils.

4.2 DESIGN MEASURES

4.2.1. A key measure in minimising disturbance has been minimising the siting of infrastructure in areas of sensitive soils, as well as minimising the need for excavation through design. Elements of the Proposed Development which require removal of topsoil during construction and where topsoil cannot be reinstated will be kept to the minimum footprint required.

4.2.2. **Table 10D-1** indicates the excavation requirements for the Proposed Development infrastructure by soil type. Volumes associated with peat and peaty soil are also included. Excavation volumes are based on the anticipated cut footprint of infrastructure and associated surrounding cut and fill.

4.2.3. The proposed turbine platforms are sited away from peat but do overlap with peaty soils at T08. The extent of the Proposed Development within the area of high sensitivity soil has been minimised to short sections of track approaching T03, T04 and T09.

4.2.4. Reuse of soils, where possible, is based on a theoretical minimum of 0.3 m to be established to support soil functioning in accordance with the mean strata depth across the Site.

4.2.5. The soils balance presented in **Table 10D-1** shows a slight positive value which means there is sufficient allocation of reuse opportunities to achieve soil balance during construction. **Table 10D-1**demonstrates that for all excavated peaty soils reuse location has been identified and excavation of peat is not expected across the Proposed Development.

4.2.6. In total, turbine-related elements comprising permanent excavation, partial restoration and turbine earthworks would account for 23,321 m^3 of excavation and 23,649 m^3 of re-use. Turbine platform (turbine foundation and crane pad) excavation would generate 7,157 m^3 of material, which is considered permanent land-take associated with this infrastructure. In contrast, the turbine partial restoration and turbine earthworks elements provide substantial capacity for on-site material re-use, with reinstatement volumes exceeding excavation volumes, thereby indicating that excavated mineral soils and peaty soils can be beneficially reused within adjacent restoration and earthworks areas.

4.2.7. Across all turbine-related elements, **Table 10D-1** confirms the absence of peat excavation and indicates that the management approach is based on the retention of peaty soils in situ where possible. Soil balance is achieved across all turbine platforms.

Table 10D-1 - Soil Excavation and Re-Use Balance for the Proposed Development.

Element of Proposed Development	Excavation (m3)				Re-use (m3)				Soil Balance (m3)*
	Mineral soils	Peaty soils	Peat	Total Excavation	Mineral soils	Peaty soils	Peat	Total Re-Use	
Turbines (Permanent Excavation) $_{\alpha}$	6,643	514	0	7,157	0	0	0	0	**-7,157**
Turbines (Partial Restoration) $_{\alpha}$	9,062	702	0	9,764	12,170	1,217	0	13,387	**3,623**
Turbines (Earthworks) $_{\alpha}$	6,069	332	0	6,401	9,542	722	0	10,264	**3,863**
New Tracks $_{\beta}$	5,441	2,181	0	7,622	4,206	1,669	0	5,875	**-1,747**
New Track Earthworks $_{\beta}$	1,955	1,610	0	3,565	3,590	1,925	0	5,515	**1,950**
Existing Tracks	3,375	0	0	3,375	4,713	0	0	4,713	**1,338**
Existing Track Earthworks	3,621	0	0	3,621	3,536	0	0	3,536	**-85**
Turning Heads	970	0	0	970	1,125	0	0	0	**155**
Ancillary	2,664	0	0	2,664	780	0	0	780	**-1,884**
Ancillary Earthworks	1,142	0	0	1,142	1,325	0	0	1,325	**183**
Total	**40,942**	**5,339**	**0**	**46,281**	**40,986**	**5,532**	**0**	**46,518**	**237**

*A negative soil balance value indicates there is insufficient allocation of reuse opportunities to achieve soil balance during construction, resulting in a surplus of excavated material without designated re-use location. A positive soil balance value indicates a there is sufficient allocation of reuse opportunities, and material may need to be imported to achieve soils balance during construction. Values shown in total, subtotals (mineral soils + peaty soils + peat) and soil balance (reuse - excavation) are rounded values. α - Soil strata around T08 were assessed as peaty due core results showing peaty profile at T08 foundation. Soils around T08 are shallow and on average < 0.3m deep. β - Peaty soils were found on the sections of new access track toward T03 and T09.

4.2.8. For track infrastructure, including new tracks, existing tracks (plus associated earthworks) and turning heads, excavation would comprise both mineral soils and, in limited locations, peaty soils. However, no peat excavation is anticipated. Collectively, these track-related elements involve 19,153 m^3 of excavation and 19,639 m^3 of re-use.

4.2.9. New track sections would generate 11,187 m^3 of excavation, including 3,791 m^3 of peaty soils. For re-use a total of 11,390 m^3 is identified, comprising mineral soils and 3,594 m^3 peaty soils. The latter will be used for dressing of new batter slopes and integration of infrastructure with the surrounding landform where peat is present.

4.2.10. Existing track upgrades and associated earthworks are confined to mineral soils only, with no peaty soil or peat excavation identified. Re-use will also be limited to mineral soils, based on assumed batter slope surface of ~2m either side of track.

4.2.11. Turning heads similarly avoid peat and peaty soils entirely, and contribute to 970 m^3 of excavation, and 1,125 m^3 re-use opportunities have been identified, following the same approach for trackside batter slopes.

4.2.12. Excavation for ancillary infrastructure (including earthworks), comprising the compounds for BESS, substation, temporary control building and temporary construction area, are likewise restricted to mineral soils, with no peat or peaty soil excavation identified. Together, these ancillary elements involve 3,807 m^3 of excavation and provide opportunity for 2,105 m^3 of re-use, with excavated mineral material either reused locally, where practicable, or transferred to adjacent reinstatement areas.

4.2.13. **Table 10D-1**demonstrates that the Proposed Development has been designed to avoid peat excavation, with no peat excavation recorded for any infrastructure element. Where peat was identified as present along limited sections of new access track, floating track construction is proposed such that peat would remain undisturbed in situ. Any batter slope identified for re-use in these locations will be used to reallocate excavated peaty soils.

4.2.14. Where disturbance of peaty soils is unavoidable, mitigation through local reuse on Site is promoted, alongside mineral soils, to facilitate restoration, batter dressing and final reinstatement.

4.2.15. The presented soil balance therefore confirms that the proposed soil and peat management strategy is founded on avoiding peat removal, minimising peaty soil disturbance and maximising the beneficial on-site re-use of peaty soils within the Proposed Development boundary.

4.3 OTHER MEASURES TO MINIMISE DISTURBANCE

4.3.1. All contractors will be made aware of the sensitivity of all soils, including peaty soils and potential for peat arisings. All contractors will be required to work within the narrowest practical construction corridor to minimise the impacts of soil compaction.

4.3.2. An access plan following the consented access track routes will be developed and physically demarcated on the ground prior to construction. The plan and demarcated route will provide a controlled route and a permissible corridor within which service vehicles and plant operate prior to soil stripping. The purpose of this is to protect soils in adjacent areas from damage that will otherwise not be affected by the Development, taking account of particular sensitivities - such as identified areas of high sensitivity soils across the Site.

4.3.3. If ground conditions necessitate, a temporary trackway of either metal, wood or plastic would be used for vehicles to access working areas. It is expected the use of temporary surfaces would be of short duration and only used until a dedicated access route is constructed.

4.3.4. The temporary construction and permanent drainage systems servicing the Proposed Development will follow the principles of sustainable drainage, aiming to mimic the existing surface water hydrology and will include the use of cross drains. Drainage systems will be designed and installed with reference to the prevailing soil conditions with specific measures implemented where soil conditions are wet or within the margins of peat. Dedicated measures associated with soil water and groundwater management have been outlined in the **Outline CEMP** and **Appendix 9A FCA**. The purpose of these measures in relation to soils will be to avoid excessive dewatering and modification of flow pathways which could result in the drying of soils and corresponding increase in susceptibility to erosion, as well as potential for increased flows and scour where drainage pathways converge. Maintaining wet conditions in organic soils shall also reduce potential for carbon losses due to oxidation.

4.3.5. Measures to minimise peat disturbance outlined in this Outline SPMP will be adopted into the Final SPMP and Final CEMP, prepared following detailed design and prior to construction. The Final SPMP will be implemented by the Principal Contractor. The ECoW shall monitor compliance of the construction activities with the CEMP and Final SPMP.

5 MITIGATE & RESTORE (STEP 3)

5.1 MAIN PRINCIPLES

5.1.1. The excavation and replacement of soils at the Proposed Development will be required during the construction phase and will include soil stripping, stockpiling and replacement / reinstatement. The trafficking of vehicles as well as poor handling practices can damage the structure of the soils which can compromise soil function and the variety of ecosystems services they offer.

5.1.2. The potential adverse effects on soils arising from trafficking and poor handling are detailed in **ES Chapter 10 Geology and Soils** and include:

- Soil erosion (loss of a resource);
- Carbon release (disturbance of organic rich soils);
- Loss of soil organic matter leading to a decline in soil and poor soil structure;
- Soil compaction leading to loss of soil structure and waterlogging, restricting aeration and rooting potential;
- Sedimentation of water features, reducing biological productivity and habitat quality;
- Loss of soil biological activity.

5.1.3. All soil handling and storage procedures should conform to the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites[1] and / or the Good Practice Guide for Handling Soils in Mineral Workings[2]. This Outline SPMP is informed by both.

5.2 GOOD PRACTICE SOIL HANDLING MEASURES

5.2.1. To mitigate potential adverse effects on soils, good practice methods will be adopted into all phases of the Proposed Development as part of the sustainable management of soils. To avoid unnecessary compaction the following good practice measures will be adopted:

- A suitably qualified Soil Specialist should be appointed by the Principal Construction Contractor (Principal Contractor) to oversee all soil management good practice measures stipulated in this and Final SPMP;
- Trafficking and storage will be minimised on topsoil and reinstated soil and only when soil conditions are suitable (i.e. dry and/or non-plastic);
- Consideration of use of ‘trackway’ system at temporary works zones for vehicles, to reduce excavation and protect soils;
- Direct movement of soil should occur between the areas being stripped/reinstated to/from designated stockpiles, where practicable (minimising handling and/or ad hoc storage);
- Soil handling to be avoided when the soil moisture content is above the lower plastic limit (see soil wetness section);
- No mixing of topsoil with subsoil, or of soil with other materials (unless planned and part of a soil ameliorating strategy);
- Store soil only in designated soil storage areas;
- Stockpiles should not be compacted, but instead gently consolidated;
- Plant and machinery should only work when ground/soil surface conditions enable their maximum operating efficiency and be maintained in a safe and efficient working condition;

- Detailed daily records to be maintained, detailing operations undertaken and site and soil conditions; and
- Ground should be suitably prepared prior to the reinstatement of soil and an appropriate aftercare plan in place.

5.2.2. For each stockpile, a plan should be kept and maintained detailing:

- Material type (topsoil or subsoil, as informed by the **Appendix 10A Baseline Soil Report**);
- Date/time when soil was stockpiled and weather conditions;
- Volume of material;
- Stockpile location; and
- Source location of material.

5.2.3. The Principal Contractor will be responsible for ensuring that records of site and soil conditions are kept, and that a detailed stockpile plan is created and maintained.

5.2.4. A pre-start meeting will be held to finalise and changes to the plans and approve associated Construction Method Statements.

5.3 HANDLING CONDITIONS

5.3.1. Handling of soil shall be kept to a minimum and only be undertaken when soil conditions are appropriate, as determined through field testing.

5.3.2. If sustained heavy rainfall (e.g. >10mm in 24 hours) occurs during soil stripping operations, work must be suspended and not restarted until the ground has had at least a full dry day or agreed moisture criteria (such as a specified soil moisture content) can be met.

5.3.3. Soil handling shall cease during rainfall that is sufficient to wet the soil surface under the following conditions:

- In light drizzle, soil handling may continue for up to four hours unless the soils are already at / near to their moisture limit.
- In light rain, soil handling must cease after 15 minutes
- In heavy rain and intense showers, handling shall cease immediately

5.3.4. In the above conditions it is assumed that the soils are in a dry state. Soil handling shall also cease where there is surface ponding, if there is frozen ground or if the ground is covered in snow.

5.3.5. During / after rainfall, field testing shall be undertaken to ensure that the soils are sufficiently dry to be handled. If they are sufficiently dry, soil handling may recommence. Soil handling shall not commence if heavy rain or snow are forecast during the period of soil handling and shall cease in advance of forecast heavy rain or snow.

5.4 FIELD TEST TO IDENTIFY SOIL HANDLING CONDITION

5.4.1. Where possible, soils should only be handled when dry and friable and above their plastic limit to avoid degradation and compaction.

5.4.2. Samples shall be tested to determine the suitability of soil conditions in advance of all soil handling. The field tests of soil shall apply to all soil materials (topsoil and subsoil) that are to be disturbed and re-used, including soils excavated from stockpiles. The 'testing' during operations can be done by suitably trained site staff and reviewed periodically by a suitably qualified Soil Specialist.

5.4.3. Soil tests are to be undertaken in the field. Samples shall be taken from each soil handling area (every 50 m for access routes and one sample per hectare for turbines and compounds) and at each soil horizon to the full depth of the profile to be recovered/replaced. The tests shall include visual examination of the soil and physical assessment of the soil consistency.

5.4.4. Decisions shall be based on at least 80% of the samples passing the particular test. Records of all tests shall be kept by the Principal Contractor.

STEP 1 - EXAMINATION

5.4.5. The first part of the test requires the visual examination of the soil sample with test indicators and outcome presented in below **Table 10D-2**.

Table 10D-2 - Visual Examination Test

Visual Indicators	Action
If the soil is wet, films of water are visible on the surface of soil particles or aggregates (e.g. clods or peds) and/or when a clod or ped is squeezed in the hand it readily deforms into a cohesive 'ball'	**no soil handling to take place**
If the samples is moist (i.e. there is a slight dampness when squeezed in the hand), but it does not significantly change colour (darken) on further wetting, and clods break up/crumble readily when squeezed in the hand rather than forming into a ball	soil handling can take place
If the sample is dry, it looks dry and changes colour (darkens) if water is added and it is brittle	soil handling can take place

5.4.6. Once visually examined a physical test is required (step 2, consistency test), regardless of outcome.

STEP 2 - CONSISTENCY TEST

5.4.7. The consistency test comprises of rolling the soil sample into a ball, with the outcome determining whether soil handling can take place shown in **Table 10D-3**.

Table 10D-3 - Consistency Test (1) - Soil is Rolled into a Ball by Hand;

Outcome	Result	Action
Impossible because the soil is too hard (dry)	Dry and friable	soil handling can take place
Impossible because the soil is too loose (dry)	Dry and friable	soil handling can take place

Outcome	Result	Action
Impossible because the soil is too loose (wet)	Wet and non-plastic	**no soil handling to take place**
Possible	Go to second test (**Table 10D-4**)	

5.4.8. Where the outcome of the consistency test indicates it is possible to roll the soil into a ball, the second part of the consistently test shall be undertaken, as detailed in **Table 10D-4**.

Table 10D-4 - Consistency Test (2) - Soil Ball is Rolled into a 3mm Diameter Thread by Hand;

Outcome	Result	Action
Impossible; the soil crumbles or disintegrates	Dry and friable	soil handling can take place
Possible	Moist and plastic	soil handling can take place **subject to additional controls for handling moist and plastic soils***

*Where the second consistency test indicates that the soil is moist and plastic, it may be appropriate to continue with soil handling if additional measures are implemented associated with the handling of moist and plastic soils. This would be applicable to heavy textured subsoil such as clay and silty clay within semi-permanently wet soils in depressions and flush areas. Handling methods for organic soils and peat are described in **Section 5.8**.

5.4.9. Although handling of peat is not anticipated, moisture is required in order to maintain functionality, therefore handling of these soils shall be avoided when dry and brittle. Good practice measures associated with peat and peaty soils is presented separately in **Section 5.8**.

5.5 SITE PREPARATION

5.5.1. Site preparation will include the creation of an access plan that will include the physical demarcation and signage of the designated access, working and storage areas as well as the removal of vegetation from within the work areas. Demarcation will be completed by the Principal Contractor and overseen by the Environmental Clerk of Works (ECoW) and suitably qualified Soil Specialist and will include;

- Sensitive environmental areas;
- Areas from which soils will be stripped;
- Locations of topsoil and subsoil stockpiles;
- Haul routes (which will be stripped of soil before establishment of the haul road surface);
- The undisturbed areas where no construction activities will take place (in these areas soil will not be stripped or trafficked for purposes other than reinstatement, vegetation maintenance and biodiversity enhancement).

5.5.2. Other preparatory site activities include;

- Design and installation of appropriate drainage to minimise impacts of soil erosion;
- Remove scrub vegetation (following any seasonal ecological constraints and mitigation requirements) in the areas requiring stripping;

- Surface vegetation can be removed by scarification and raking, or blading off; and
- Remove other vegetation present, so that it is not incorporated into the soil strip. If applicable, cut the grass/crop to ground level.

5.6 SOIL STRIPPING

5.6.1. The precise method of stripping and the depth to which the topsoil and subsoil will be stripped will be determined during the detailed design phase prior to construction and will be location specific. An indicative estimate for soil stripping for the soil types at the Proposed Development has been provided in **Table 10D-1**.

5.6.2. Soil horizons should be stripped sequentially in the order they are present - topsoil to upper subsoil horizons, to lower subsoil horizons.

5.6.3. Once the working width has been cleared of vegetation, existing topsoil will be stripped (with the exception of an area to be used for topsoil storage). Stripping will be carried out when soil conditions are appropriate for handling (See **Section 5.4**). Subsoils should only be stripped if they are being re-used or are of low resilience to reduce compaction. Areas which are going to be used for subsoil storage should have the topsoil stripped to avoid mixing. Topsoil must be stripped before any subsoil destined for reuse is stripped to reduce the risk of mixing the horizons.

5.6.4. Appropriate machinery and methods will be used to minimise soil compaction where the soil conditions indicate that compaction is possible. Topsoil stripping will generally be undertaken by an excavator positioned on the surface of the topsoil, excavating to the maximum topsoil depth without disturbing or removing the subsoil. Alternatively, a dozer can be used to strip the topsoil (if less sensitive) by pushing the topsoil into a bund or to an excavator. Following the topsoil strip, subsoil will be excavated to the required depth from the trenches. These methods are illustrated below in **Plate 10D-2**.

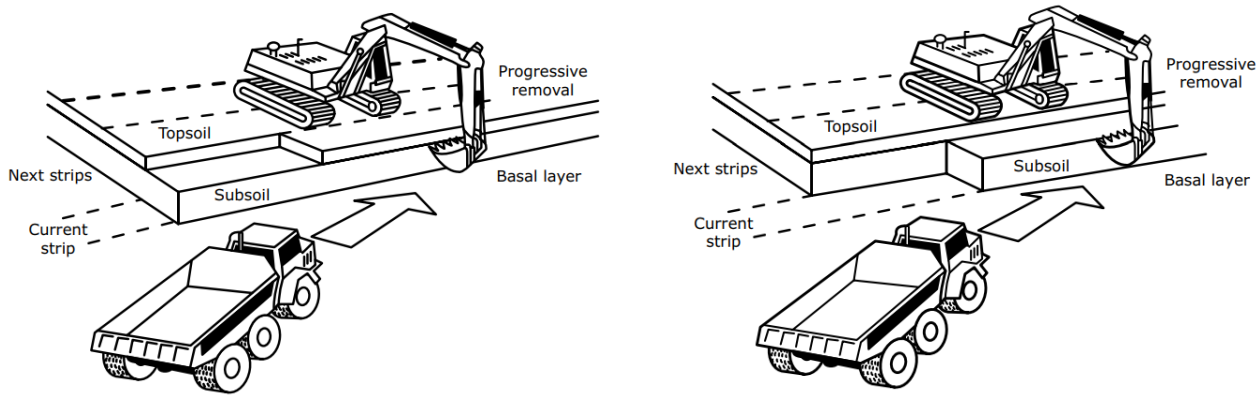

Plate 10D-2 - Illustration of Topsoil (left) and Subsoil (right) stripping methods taken from the Institute of Quarrying Good Practice Guide for Handling Soils in Mineral Workings[6]

5.6.5. Good practice measures to minimise soil compaction, and maximise readiness for re-use are summarised below;

- Integrating all soil stripping, moving, storage and reuse/reinstatement operations into the enabling works programme;
- Ensuring dump trucks only operate on the “basal”/non-soil layer and that the wheels do not travel on the soil layer;
- Ensuring the excavator only operates on the topsoil layer;
- Only working plant and machinery when ground conditions allow maximum efficiency;
- Only soil stripping when soil conditions are suitable and the moisture content of the soil is below the lower plastic limit (**Section 5.3**). Advice should be sought from a suitably qualified Soil Specialist when soil stripping in areas of permanently wet soil;
- Ceasing operation during prolonged periods of rainfall (e.g. >10mm in 24 hours) and only recommencing if the forecast predicts no further rainfall for a day and soil moisture conditions are suitable;
- Ensuring the lower soil layers are not left exposed to rainfall. This can be achieved by always stripping to the basal layer before rainfall occurs and/or before stripping is suspended;
- Protecting the soil and the basal layer from ponding of water by diverting water inflow away;
- Not working when there is standing water on the soil surface or the basal layer;
- Not mixing topsoil with subsoil and soil with other construction materials; and
- Storing topsoil on topsoil and subsoil on subsoil or on the basal layer.

TOPSOIL STRIPPING METHOD

5.6.6. The stripping method should follow the method within the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites[1] and Good Practice Guide For Handling Soils[6] Sheet A, Soil Stripping with Excavators and Dump Trucks - Sequential Bed/Strip Practice. This is also illustrated in **Plate 10D-1**.

5.6.7. Prior to commencement, the width of each strip should be determined by looking at the length of the excavator less the stand-off to operate. Using the reach of the excavator to its full potential before moving it, reduces the number of areas subject to the weight of the standing plant.

5.6.8. No more than two weeks prior to excavation, the surface vegetation should be removed by blading off.

5.6.9. The transport vehicle should run on the basal layer under subsoil if subsoil is also to be stripped. If only topsoil is to be stripped, the vehicle can run on the subsoil layer.

5.6.10. Stripping should be undertaken by the excavator standing on the surface of the topsoil, digging the topsoil to its maximum depth (topsoil thickness ranges between 0.1 - 0.4 m within the Site) and loading into site or off-site transport vehicles.

SUBSOIL STRIPPING METHOD

5.6.11. Where subsoils are being re-used or are of low resilience, the soil layers above the basal/formation layer should be removed in sequential strips that can be up to 6 m wide (the reach of a 360° excavator). Using an excavator bucket with teeth is preferable to achieve desired outcome.

5.6.12. Where there is a cover of topsoil, that layer is removed first before stripping subsoil to the specified depth.

5.6.13. The soil transport vehicle should run on the layer beneath the required subsoil stripping depth.

5.7 SOIL STORAGE

5.7.1. Where possible, stripped soil types will be appropriately re-used immediately after excavation in sequential manner. Access track footprints, access track batters and other infrastructure batter slopes would be excavated and present opportunities for relatively prompt reinstatement. Other temporary areas such as the construction compound will require storage of soils for reinstatement upon the completion of construction. Soils from permanent infrastructure such as turbines, crane pads and the substation would be appropriately reinstated as part of infrastructure dressing at the end of the construction phase but may also require longer term storage (>6 months) until receiving areas are available.

5.7.2. The stripped topsoil and excavation subsoil will be stored adjacent to working areas. The ground where the soil stores will be located will be free from vegetation and waste, positioned away from watercourses and ditches and other sensitive receptors. They should also be located away from soils with a low resilience to damage. Cut off ditches and swales will be used to divert water to a suitable drainage system. Where possible, all designated soil storage areas would be a minimum of 10 m from any open watercourse features. Stockpile locations will be confirmed following detailed design prior to construction in the Final SPMP.

5.7.3. Topsoil and subsoil of different types and from different fields on the periphery of the Site or uncultivated areas in the central stand of the Site will be stored separately to reduce the potential for mixing during reinstatement. Sufficient space will be left between stores of different soil types to ensure separation.

5.7.4. Topsoil can be stored on either topsoil (of the same type) or on subsoil. Subsoil can only be stored on subsoil; therefore, the topsoil will be stripped from any subsoil storage areas prior to subsoil stripping or placement.

5.7.5. Stripped topsoil will be stored to the side of the working areas in a manner that provides sufficient separation from subsoil and vehicles. Soil will be stored in an area of the Site where it can be left undisturbed and will not be affected by the Proposed Development.

5.7.6. Topsoil will be stored in bunds no more than 2 m in height, and subsoil will be stored in bunds no more than 3-5 m in height in order to minimise compaction and the impact of storage on biological processes.

5.7.7. It will be necessary to record and signpost the different stores of soil to avoid confusion and risk of contamination. Stockpiles will be labelled with appropriate signage, a unique identifier and recorded on a plan. They will also be regularly inspected (at least monthly) to ensure compliance with the SPMP documentation.

5.7.8. The method used for stockpiling will depend upon the wetness of the soil in relation to the plastic limit. Stockpiling methods for wet plastic soils and dry non-plastic soils are illustrated in **Plate 10D-3** and is also summarised below.

DRY SOIL STOCKPILING METHOD

- Loose tip heaps of soil from a dump truck starting at the furthest point in the storage area, working towards the access point;
- A tracked excavator or dozer then levels the heaps and firms the surface to enable a second layer to be added;
- Repeat until the stockpile has reached the desired height; and
- With a tracked excavator or dozer, compact and re-grade the sides and top of the stockpile to a smooth gradient to reduce infiltration and the likelihood of ponding.

WET SOIL STOCKPILING METHOD

5.7.9. This is only to be used in a scenario where the construction programme or prevailing weather conditions prevent dry stockpiling. This method is not preferred as it poses a higher risk of damage to soil.

- Tip soil into a line of heaps to form a “windrow”, start at the furthest point, finish at the access point;
- Space windrows sufficiently apart so a tracked dozer or excavator can move between them to heap the soil up to 2 m maximum;
- No machinery should traverse the windrow to avoid compaction and subsequent structural damage to the soil;
- Once the soil has reached a non-plastic consistency, which often takes many weeks, combine the windrows to form larger stockpiles using a tracked excavator; and
- Regrade and compact the sides and top of the stockpile using a tracked excavator or dozer, to prevent ponding and infiltration.

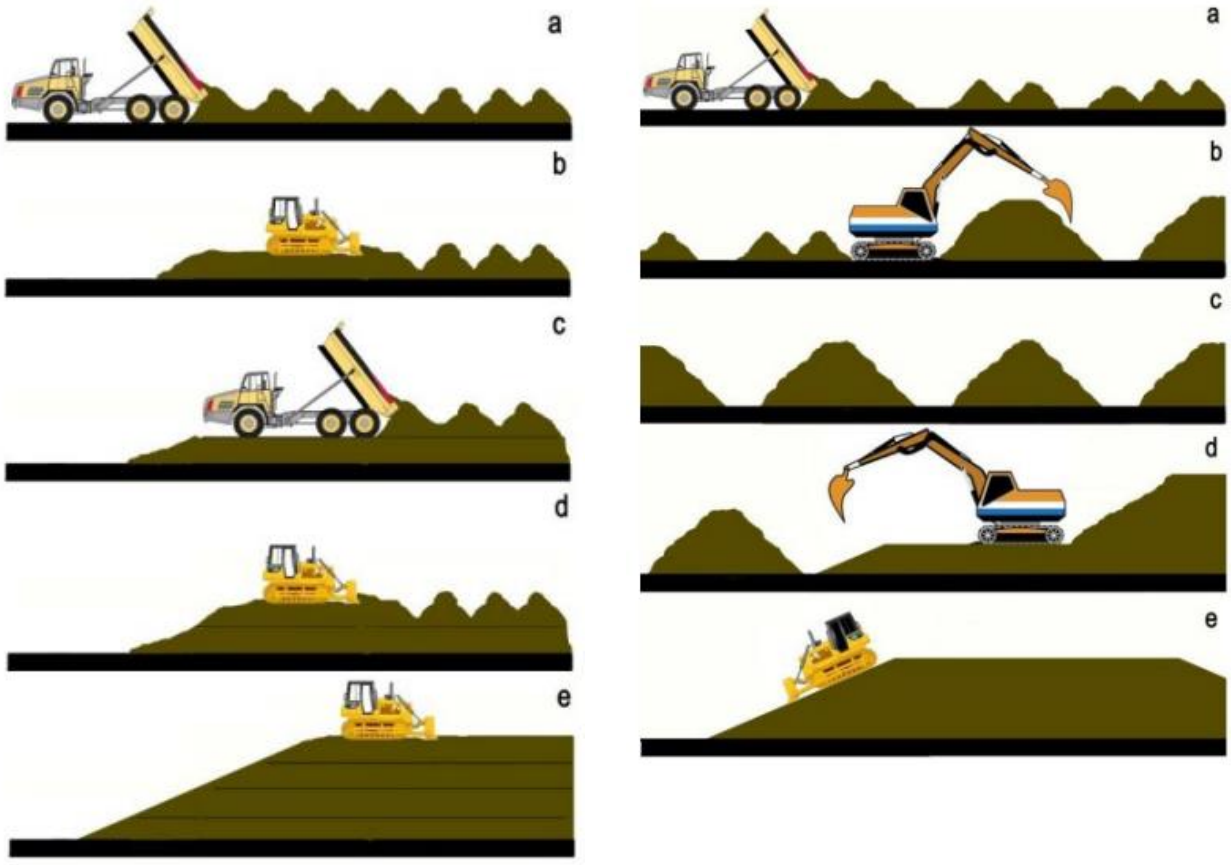

Plate 10D-3 - Dry Soil Stockpiling Method for Dry Non-Plastic Soils (left) and Wet Soil Stockpiling Method for Wet Plastic Soils (right) taken from the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites[9].

MAINTENANCE OF STOCKPILES

5.7.10. Where stockpiles are required for >6 months, the surface will be seeded with a seed mix that comprises species native to the local area of the Site or covered with turves. Where seeding occurs in periods of dry weather stockpiles shall be sprayed down with water to prevent wind erosion and encourage the establishment of the seed mix.

5.8 MEASURES APPLICABLE TO PEAT AND PEATY SOILS

5.8.1. The disturbance of peat during the construction of the Proposed Development is very unlikely based on the assessment information presented in this Outline SPMP and the BSR. As outlined in **Section 3**, the infrastructure has been designed to avoid peat, with localised overlap of track alignments that will be floated.

[9] The Institute of Quarrying (2021). Good Practice Guide for Handling Soils in Mineral Workings Available at https://885685.fs1.hubspotusercontent-na1.net/hubfs/885685/Soils%20Guidance/IQ%20Soil%20Guidance%20Part%201.pdf

5.8.2. Good practice mitigation measures will be adopted for minor areas of organic wet peaty soils within working areas. Given the highly heterogenous distribution of soil types within the Site, good practice handling methods are provided as a precautionary input and will be applicable for deposits of peat that may be encountered.

PREPARATION

5.8.3. All infrastructure within areas of peat would be marked out on the access plan and demarcated on the ground to minimise unnecessary disturbance.

5.8.4. Excavation would be undertaken by suitably experienced personnel in appropriately sized plant, such as 360-degree low-pressure tracked excavators.

5.8.5. The timing of excavation should be planned as to allow reinstatement to be undertaken as quickly as possible in order to minimise the peat and vegetation drying out, which would adversely affect successful re-use. The disturbance of peaty soils should also avoid very wet weather.

5.8.6. Excavation activities should be undertaken in accordance with other good practice mitigation including drainage management and pollution prevention. It is essential to minimise the effects of erosion on excavated peat and peatlands through good practice.

EXCAVATION

5.8.7. 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;
- Contamination of excavated peat with substrate materials such as heavy textured clay or silty clay should be avoided; and
- Consider timing of excavation activities to avoid very wet weather and multiple mechanical handling requirements to minimise the likelihood of excavated peat losing structural integrity.

5.8.8. Any dewatering of excavations in peat and peatland should only be undertaken when absolutely necessary. Measures to minimise the effects of dewatering from upgradient areas around excavations should be implemented where possible, including the use of stripped vegetation to seal low angled cut peat faces.

STORAGE

5.8.9. Consideration for the storage of peat has been undertaken with respect to the Scottish Renewables & SEPA Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and Minimisation of Waste[3].

5.8.10. The priority should be to transfer peaty soils straight to a suitable area for reinstatement. Given the likely minimal extent (if any) of peat excavation it is not anticipated dedicated storage will be required, with excavated peat immediately reinstated in adjacent areas that have suitable environmental conditions that would support the long term functioning of peat. However, where soils cannot be transferred immediately, short term storage will be required, and the following good practice applies:

- Where accessible, the storage of peaty soils and peat should be located in areas that have been previously subject to necessary disturbance and should be at least 10 m from a watercourse;

- Local gullies, diffuse drainage lines (or very wet ground) and locally steep slopes should be avoided for storage;
- The Principal Contractor, ECoW and Soil Specialist will determine the requirements for any preparatory works including ground smoothing, benching, or bunds;
- Drainage and pollution prevention controls would be implemented as necessary;
- Peat and peat turves would be transported intact, with vegetation upright in a single layer on top of geotextile membrane. Stored peat would also be covered with turves in a manner to maximise coverage;
- Stored upper turves (incorporating vegetation) should be organised and identified according to NVC community (assisted by the ECoW) for reinstatement adjacent to like communities in the intact surrounding peat blanket;
- Wet peat can be stored to a thickness <1.0 m, drier and more stable peat can be stored to a thickness of <2.0 m;
- Drying of stored peat should be avoided by irrigation (weekly inspections (and watering if applicable) in dry spells recommended);
- Regular inspection of the temporary storage areas should be undertaken by the ECoW. Issues or concerns should be appropriately actioned by the Principal Contractor; and
- When peat storage is no longer required, the removal of peat would be subject to the same controls outlined for Peat Excavation.

TRANSPORT

5.8.11. Movement of turves should be kept to a minimum once excavated, and therefore it is preferable to plan to transport peat planned for translocation and reinstatement to its receptor destination at the time of excavation (to avoid double-handling via temporary storage locations).

5.8.12. 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 mixing of peat soils with other materials.

REINSTATEMENT

5.8.13. The successful reinstatement of peaty soils and peat is required to ensure it can continue to function and not comprise the ecosystem services offered.

5.8.14. In line with the Step-Wise approach and associated good practice guidance, the primary design aim is to avoid disturbing peat and peaty soil. Whilst the design has avoided peat, due to engineering, logistical or other environmental constraints, the complete avoidance of peaty soil by Proposed Development infrastructure was not feasible. Therefore, the Development must minimise the effects of disturbance through design and mitigation, namely reinstatement of peaty soils that allows it to remain part of the peatland system and not for it to degrade and lose function as a means of carbon sequestration.

5.8.15. All excavated material from the construction of the Proposed Development would be re-used on site to provide the best environmental outcome.

5.8.16. Peaty soils would be reinstated on low angled batter slopes within areas of topographic convergence / flush features that will facilitate wet soil conditions. This may include the preferential re-use of peat of the upgradient side of access tracks.

5.8.17. It is not anticipated that any peat (including amorphous peat) will be encountered. Should this occur, specific measures shall be prepared to manage this sensitive material and seek to minimise disturbance and handling requirements.

5.9 PRINCIPLES OF REINSTATEMENT

5.9.1. Reinstatement and aftercare are essential to ensure the long-term viability of the soil resource within the Proposed Development and should be undertaken to replicate the pre-construction conditions as far as reasonably possible.

5.9.2. All mitigation methods should align with the guidance on handling and soil conditions presented in earlier sections of this Outline SPMP.

5.9.3. The aim of the reinstatement of soils shall aim to ensure that reinstated soils are uncompacted, aerated and replaced sequentially in the order they were removed.

5.9.4. Following excavation, the reinstatement of soils would be undertaken as soon as possible. The weather and soil condition constraints applicable to soil stripping will also apply to soil reinstatement.

5.9.5. For access tracks, turbines, crane pads, substation and control room, the reinstatement of excavated soils will be within peripheral areas as part of the creation and dressing of batter slopes. Reinstated subsoil and topsoil thickness shall generally seek to reflect pre-construction conditions, however, to avoid a surplus of materials, the placement of soils from permanently stripped areas will be thicker in some sections and will taper down into surrounding areas to provide suitable tie-in to surrounding vegetation and soils.

5.9.6. The reinstatement of soils should follow good practice methods and should include taking care to avoid the mixing of different soil horizons.

5.9.7. Soil health would be monitored following the completion of construction and any deficiencies rectified in a timely fashion.

EXCAVATION OF SOIL STOCKPILES

5.9.8. The excavation of soil stockpiles should be completed with reference to the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites[1] and Good Practice Guide For Handling Soils[6] Sheet C, Excavation of Soil Storage Mounds with Excavators and Dump Trucks.

5.9.9. The dump trucks should enter on the basal layer or subsoil. If a back-acting excavator is used, it should stand on top of the stockpile to load the dump truck. The stockpile should be dug to the base before moving progressively back along its axis. If a front-loading machine is used, any exposed edges or surface of the stockpile should be shaped to reduce the pooling of water at the onset of rain and end of each day.

PREPARATION OF BASAL LAYER

5.9.10. Areas where stockpiles, haul routes and other high traffic are located will require decompaction before soil reinstatement. The substrate should be decompacted to reduce flood risk and promote plant root growth. For decompaction, a wing-tine ripper is recommended. This includes ripping subsoils in agricultural areas to return them to their previous conditions and not introduce a wetness limitation. Large stones and debris should also be removed from the area before reinstatement.

SOIL REINSTATEMENT

5.9.11. All horizons should be reinstated in the same order as they were before disturbance (avoiding mixing of textures where possible).

5.9.12. Reinstatement should take place when the soil is below the plastic limit; if it rains more than 10 mm in 24 hours it is advised to suspend reinstatement until the soil is below the plastic limit. Soil is not advised to be reinstated when the ground is frozen or in other adverse weather conditions.

5.9.13. To return soils to an area the loose tipping method is recommended as this allows minimal disturbance to the soils structure;

- Loosen the receiving group using a wing-tine ripper, with a toothed bucket (which avoids excessive smearing) and load the stockpiled soil in to dump trucks to transport and discharge the soil into the desired location;
- The soil should be reinstated in strips based on the reach of the excavator. An excavator should be used to spread the soil to the desired thickness; and
- If replacing both subsoil and topsoil, all subsoil should be laid initially, then all topsoil. Topsoil should be laid without the excavator travelling on the newly placed subsoil.

5.9.14. All reinstated topsoil should be cultivated to its full depth to reduce compaction and increase aeration. Cultivation should remove the presence of any large, compacted lumps. Cultivation can be achieved through using appropriate tillage equipment (e.g., a power harrow or chisel plough) to break down soil aggregates to a fine tilth. For seeding, a maximum aggregate size of 10 mm is recommended.

5.9.15. If any undesirable materials (such as stones or fill over 50 mm in any dimension) are present, it is recommended to remove them by raking or picking.

5.9.16. Any agricultural fields would be restored to their previous condition where possible.

5.10 AFTERCARE OF REINSTATED SOILS

5.10.1. The success of construction and the subsequent re-use of soils across the Site will be monitored by the ECoW in consultation with a suitably qualified Soil Specialist to ensure that any adverse effects on soils are appropriately understood and disturbance reduced via any remedial works that can be undertaken. The details of monitoring would be discussed and agreed with NRW, LQAS and the Local Planning Authority prior to commencement. Appropriate monitoring is important to;

- Provide reassurance that established mitigation and reinstatement measures are effective and that the site is not having a substantial adverse impact upon the local and/or wider environment;
- Indicate whether further investigation is required, where pollution is identified or unsuccessful reinstatement, with the need for additional mitigation measures; and
- Understand the long-term effects of the Site on the natural environment.

5.10.2. Due to the nature of the construction activities and the possibility that such works can increase the volume of particulate matter from entering the natural drainage network a robust hydrological monitoring strategy will be implemented.

5.10.3. A reinstatement monitoring strategy can also be implemented, where surveys can be carried out to monitor the success of soil re-use and subsequent reinstatement. Complimentary to the hydrological monitoring highlighted above and good practice geotechnical monitoring, the success of vegetation reinstatement can provide an insight into the effects of the wind farm on the local environment. Full details of the environmental monitoring strategies will be finalised following consultation with NRW, LQAS and the Local Planning Authority.

5.11 SOIL RE-USE AND DISPOSAL

5.11.1. In the event that there is a soil surplus from construction activities, all suitable (chemically/physically suitable) material will be beneficially reused on Site as part of infrastructure dressing and final reinstatement. No surplus is anticipated which would lead to a requirement for disposal of soils off-site.

5.11.2. If excavated materials are unsuitable for reuse, such as contaminated soils or hazardous materials, this will be removed off-site and disposed in accordance with the Final CEMP. The Principal Contractor will follow appropriate legislative requirements and good practice. The material would be appropriately classified prior to transport to a suitably licenced landfill / treatment centre.

5.11.3. The landowner / occupier will be engaged where any off-site disposal is required. In such instances, disposal will be undertaken in accordance with waste management regulations (England and Wales).

6 COMPENSATE ON SITE (STEP 4)

6.1.1. In order to provide a benefit to peatland habitats within the Site, it is recommended that targeted peatland restoration be undertaken within suitable areas, namely the discrete low angled basin peat deposits as identified in areas of high sensitivity soils. Peatland restoration would aim to improve the functionality of adjacent peatland through mechanical intervention aiming to raise the water table but also increase the density and health of peat forming plant species. Restoration techniques could include drain blocking and reduction in grazing / trampling pressure through land management. Further study would be completed post-consent, prior to construction, to identify the extent of areas where peatland restoration could be feasible as well as the final list of management prescriptions.

6.1.2. Proposed biodiversity enhancement measures to improve the quality of the upland heath include bracken harvesting and a reduction in grazing / trampling pressure through land management. Improvement measures would be undertaken sensitively to minimise disturbance on apparent areas of high sensitivity soils. The improvement in the quality of the upland heath habitat would provide a beneficial effect to these areas by aiming to preserve favourable soil conditions and enhance ecosystem services (including water quality, flood attenuation, carbon sequestration and biodiversity gains), by minimising pressures that might otherwise lead to degradation or deterioration of soil function.

6.1.3. Further details of peatland restoration and other biodiversity enhancement measures are detailed in **Chapter 5 Ecology Appendix 5O: Outline Habitat Management Plan.**

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