
A83 Rest and Be Thankful

LTS EIAR VOLUME 4, APPENDIX 12.6 - OUTLINE PEAT
MANAGEMENT PLAN

Transport Scotland

A83AAB-AWJ-EAC-LTS_GEN-RP-LE-000274

A12-6.Outline Peat Management Plan

A12-6.1. Introduction

Background

- A12-6.1.1. This report presents an Outline Peat Management Plan (PMP) required to ensure the appropriate management of carbon rich soil (also referred to as peat) arising during the earthworks required as part of the construction of the Proposed Scheme plus a 250m buffer (study area). The footprint of the Proposed Scheme can be seen in Volume 3, Figure 4.1 Scheme Layout Overview. There is no requirement to excavate areas of peat during the operation of the Proposed Scheme.
- A12-6.1.2. The report focuses on the areas of the Proposed Scheme where peat has been identified through desk-study and previous ground investigations (GIs). The information within this plan may be subject to change following future stages of GI.
- A12-6.1.3. The management and storage of peat will be crucial to successfully retaining landscape character and the Proposed Scheme's net effect on climate emissions and sequestration.
- A12-6.1.4. The description of the Proposed Scheme is set out within Chapter 4: The Proposed Scheme, of the Environmental Impact Assessment (EIA) Report.
- A12-6.1.5. This Outline PMP (hereby referred to as the PMP) aligns with policies relating to peat, highlights the impacts of the Proposed Scheme on peatland, and required remediation, and recommends how monitoring will highlight future impacts.

A12-6.2. Scope of Work

A12-6.2.1. This PMP has the following main aims:

- to summarise the impact of the Proposed Scheme on peatlands, including baseline depth, habitat condition, quality, and stability of carbon rich soils
- to identify the likely effects of the Proposed Scheme on the identified peatland and
- to identify the likely net effects of the Proposed Scheme on climate emissions and loss of carbon.

A12-6.2.2. This PMP aligns with the recommendations from the A83 Environmental Steering Group (ESG) following their review of the EIA Scoping Report (refer to Volume 4, Appendix 6.1 Summary of Scoping Consultation Responses) that restoration to achieve offsetting (i.e. compensation rather than biodiversity enhancement) would be in the order of 1:10 (lost:restored), i.e. 1 ha loss of peatland should result in measures to restore 10 ha of peatland and that to achieve enhancement, an additional 10% of the baseline assessment of the extent of priority peatland habitat would be required. Section A12-4.12. Peat Management provides more information on achieving offsetting following peat disturbance and extraction.

A12-6.3. Relevant Policy and Guidance

A12-6.3.1. The following policy and guidance documents have been considered during the development of this PMP:

- [Scottish Government. National Planning Policy 4 - Policy 5. February 2023](#)
- [Scottish Environment Protection Agency \(SEPA\). Regulatory Position Statement – Developments on Peat. February 2010](#)
- [Scottish Government, Scottish Natural Heritage, SEPA. Peatland Survey. Guidance on Developments on Peatland. 2017](#)
- [NatureScot, Advising Peatland Carbon Rich Soils and Priority Peatland Habitats Development Management. November 2023](#)

- [Scottish Renewables/SEPA. Developments on Peatland: Natural Scotland. Promoting the Sustainable Reuse of Greenfield Soils in Construction. March 2010](#)
- [SEPA/Envirocentre. Restoration Techniques Using Peat Spoil from Construction Works. Final report. July 2011](#)
- [Scottish Renewables/SEPA. Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste. Version 1. January 2012](#) and
- [SEPA. Developments on Peat and Off-site Uses of Waste Peat. SEPA guidance WST-G-52. Issue 1. May 2017](#)

National Planning Framework 4 – Policy 5

A12-6.3.2. The National Planning Framework 4 (NPF4) recognises that significant weight should be given to addressing the global climate and nature crises when considering all development proposals (Policy 1). Proposals must also protect, conserve, restore and enhance biodiversity (Policy 3). In addition, the intent of Policy 5 is to protect carbon rich soils, restore peatlands, and minimise the disturbance to soils caused by development.

A12-6.3.3. This PMP aligns with the NP4 Policy 5 a, c and d, outlined below:

- (a) Development proposals will only be supported if they are designed and constructed:
 - (i) In accordance with the mitigation hierarchy by first avoiding and then minimising the amount of disturbance to soils on undeveloped land and
 - (ii) In a manner that protects soil from damage including from compaction and erosion, and that minimises soil sealing.
- (c) Development proposals on peatland, carbon rich soils and priority peatland habitat will only be supported for:
 - (i) Essential infrastructure and there is a specific locational need and no other suitable site and

- (v) Restoration of peatland habitats.
- (d) Where development on peatland, carbon rich soils or priority peatland habitat is proposed, a detailed site-specific assessment will be required to identify:
- (i) the baseline depth, habitat condition, quality and stability of carbon rich soils
 - (ii) the likely effects of the development on peatland, including on soil disturbance and
 - (iii) the likely net effects of the development on climate emissions and loss of carbon.

This assessment should inform careful project design and ensure, in accordance with relevant guidance and the mitigation hierarchy, that adverse impacts are first avoided and then minimised through best practice. A PMP will be required to demonstrate that this approach has been followed, alongside other appropriate plans required for restoring and/or enhancing the site into a functioning peatland system capable of achieving carbon sequestration.

A12-6.4. Related Chapters

A12-6.4.1. This PMP aligns with the approaches of several Chapters and Technical Appendices for the Proposed Scheme, including:

- Chapter 4 The Proposed Scheme
- Vegetation Classification survey (NVC) habitat mapping (Chapter 11 Biodiversity and Volume 4, Appendix 11.4 Designated Sites and Terrestrial Habitat Report)
- Volume 4, Appendix 11.15 Outline Landscape and Ecological Mitigation and Management Plan and
- Chapter 12 Geology, Soils and Groundwater.

A12-6.5. Limitations and Assumptions

Limitations

- A12-6.5.1. The findings contained within this PMP are based upon the accuracy and level of detail of the documented data sources listed within Section A12-4.3. However, the authenticity and reliability of the information cannot be guaranteed. Furthermore, it is possible that the work carried out may not indicate the full extent of peat conditions across the Proposed Scheme boundary and this assessment may lack information. The impact assessment to peat outlined in this PMP considers GIs undertaken by Raeburn Drilling and Geotechnical Limited in 2022 and 2023. GI Factual reporting for the OMR improvements is due in December 2024 and GI along the route of the LTS is due to start in November 2024. Further updates to this PMP will be made once the data from these are available.
- A12-6.5.2. A limitation of this PMP is the lack of a Peat Stability and Landslide Hazard Risk Assessment (to be developed as part of the reporting following further GI and ground investigation report (GIR)).
- A12-6.5.3. This PMP is based on the Proposed Scheme design set out within Chapter 4 The Proposed Scheme.

Assumptions

- A12-6.5.4. Information on the nature of the underlying materials has been provided through assessing available published information (Section A12-4.3) and GI information. It is anticipated that the assessment of this information and the associated tie-in with the design process will limit unnecessary excavation of materials.
- A12-6.5.5. The design process takes steps to limit the volume of material being excavated due to the financial and programme implications of managing unnecessarily excessive volumes of arisings. Therefore, the decision-making process fully documents evidence of measures taken to prevent and reduce

the volume of material being excavated throughout the formulation of the design particularly with relation to points in Section A12-4.12.

- A12-6.5.6. The Biodiversity Net Gain and Natural Capital areas are excluded from this assessment as it is assumed that any enhancement works will not impact peat. Future iterations of this PMP will consider these areas if enhancement works are found to impact peat.

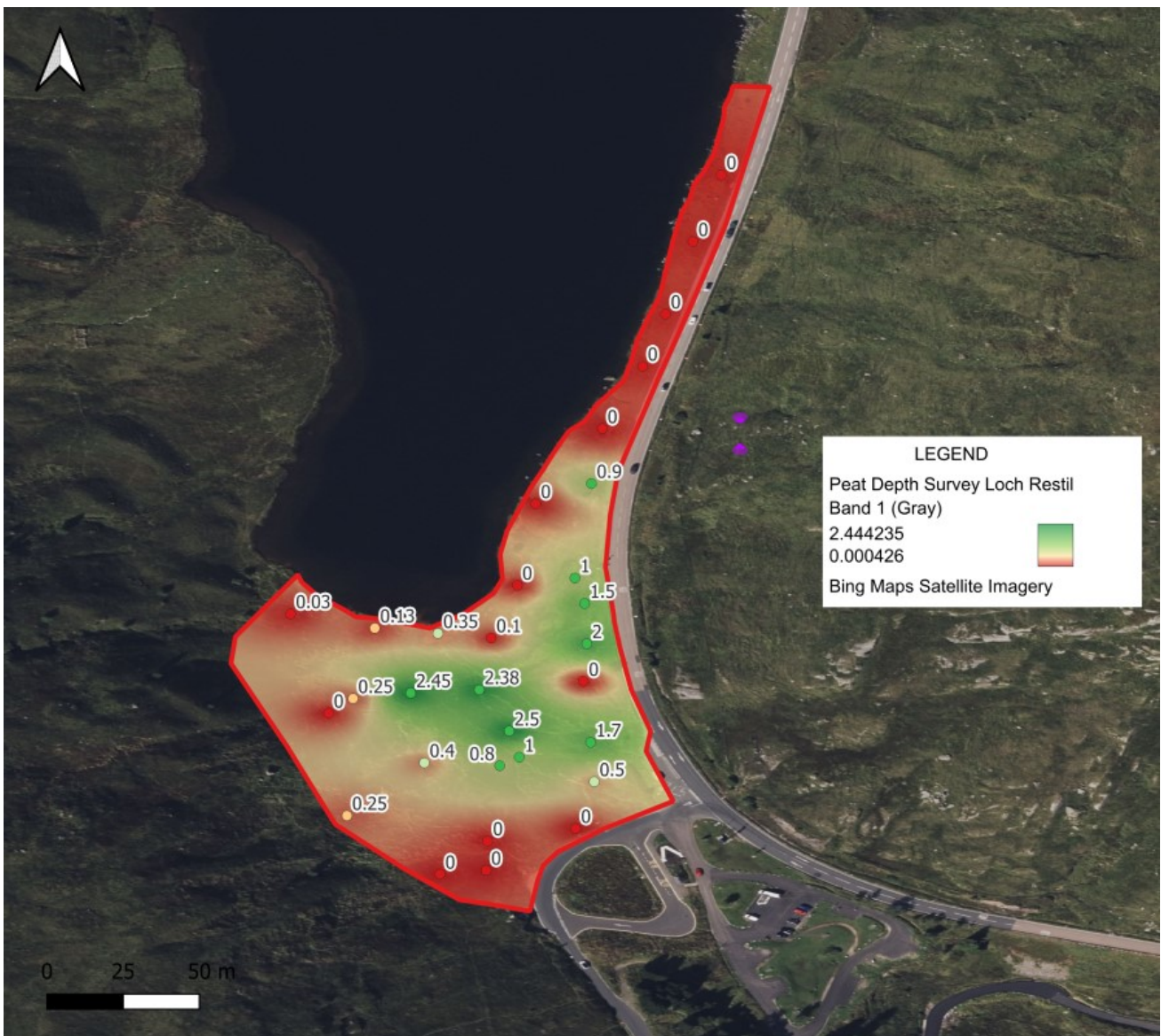
A12-6.6. Previous Investigations and Surveys

- A12-6.6.1. Two rounds of GI were undertaken by Raeburn Drilling and Geotechnical Limited in February to June 2022 and then again in July 2023. The combination of both 2022 and 2023 GI (all locations in open ground) are shown in Volume 3, Figure 12.3 – Ground Investigation Locations.
- A12-6.6.2. The Preliminary GI in 2022 involved the drilling of 66 boreholes via a mixture of cable percussion, sonic resonance, rotary open hole, rotary percussive and rotary core drilling methods. A further eight trial pits were excavated by mechanical means. Geotechnical, geochemical and groundwater sampling occurred as part of the 2022 GI.
- A12-6.6.3. The 2023 GI involved drilling two boreholes and excavating five trial pits, with the extension of one existing trial pit. This GI focussed on the realignment of the OMR.
- A12-6.6.4. A peat probing survey was undertaken in June 2024 to the south of Loch Restil for an area marked for a swale.

A12-6.7. Probing Data

- A12-6.7.1. A peat probing survey was undertaken in June 2024 to the south of Loch Restil for an area marked for a swale. The results of this peat probing exercise are presented below as Plate A12-1.

Plate A12-1 : Peat Probing Results around Loch Restil in the area of the now discontinued swale



A12-6.7.2. Given the depth of peat identified, the drainage proposals in this part of the Scheme were amended and the swale was descope from the Proposed Scheme to avoid disturbing areas of deep peat.

- A12-6.7.3. The proposed GI along the OMR is due to be reported in December 2024, but initial indications suggest that the peat deposits are limited in extent and are present as buried peat in mass movement deposits. Further assessment on the requirements of Peat Probing along the OMR will be made following a review of the factual report.
- A12-6.7.4. The GI for the LTS is due to start in November 2024. This PMP will be revised when the data from the updated GIs is made available, and where necessary probing is complete. It should be noted that GI stage probing shall confirm depth to bedrock, which may indicate peat deposits, but may also indicate mass movement deposits or other materials which probes pass through. Thus, it may be difficult to distinguish peat, however, trial pits or borehole evidence will be used to corroborate materials in probing zones.

A12-6.8. Ground Investigation Data

- A12-6.8.1. Information obtained from the Raeburn Drilling and Geotechnical Limited Access to Argyll & Bute (A83) August 2023 identified peat in 27 exploratory holes.
- A12-6.8.2. Peat was identified predominantly as 'dark brown plastic pseudofibrous peat with wood fragments and plant material' at depths between ground level and 2.00 m bgl (below ground level) in AAB-BH1013, AAB-BH1013i, AAB-BH1015, AAB-BH1033, AAB-BH1038, AAB-BH1039i, AAB-BH1050, AAB-TP1001, AAB-TP1002 and AAB-TP1010. 'Dark brown plastic amorphous peat' was noted between 4.20m and 5.00m bgl and 5.15m bgl and 5.50m bgl in AAB-BH1022. Additionally, peat with no further description was noted between 4.60m bgl and 6.10m bgl in AAB-BH1022A.
- A12-6.8.3. 'Very peaty slightly gravelly sandy topsoil' was noted between ground level and 0.20m bgl in AAB-TP1003, AAB-TP1006 and AAB-TP1009.
- A12-6.8.4. Peat was noted as a constituent within sand, predominantly in the form of 'Gravelly silty peaty sand' between depths of ground level and 3.70m bgl in, AAB-BH1013i, AAB-BH1020, AAB-BH1024A, AAB-BH1024B, AAB-BH1026,

AAB-BH1027A, AAB-BH1028, AAB-BH1029, AAB-BH1051B and AAB-TP1006. 'Gravelly very silty sand with pockets of PEAT' was noted between 0.50m and 1.10m bgl in AAB-BH1013 and 'gravelly very silty sand with small lenses of peat' between 2.50m bgl and 3.00m bgl and 6.50m bgl and 7.50m bgl in AAB-BH1026.

- A12-6.8.5. Peat was noted as a constituent within gravel, predominantly in the form of 'sandy, silty gravel with pockets of spongy pseudofibrous peat' or as 'very sandy clayey slightly peaty gravel' between depths of 0.30m bgl and 4.20m bgl in AAB-BH1001, AAB-BH1002, AAB-BH1015, AAB-BH1026 and AAB-BH1032. 'Very sandy silty gravel with small lenses of peat' was noted between 4.50m bgl and 6.00m bgl in AAB-BH1026 and 'very sandy silty gravel with pockets of peat was noted between 0.50m bgl and 2.05m bgl in AAB-BH1001 and AAB-BH1039.
- A12-6.8.6. Peat was noted as a constituent within silt and was generally described as 'slightly gravelly, slightly sandy peaty silt' between 0.40m bgl and 1.10m bgl in AAB-BH1033.
- A12-6.8.7. The location of these boreholes are spread across Glen Croe and exact locations can be seen in figures in the Report on Preliminary Ground Investigation August 2023.
- A12-6.8.8. Information obtained from the Raeburn Drilling and Geotechnical Limited Access to Argyll and Bute (A83) Medium Term Solution - Phase 1, Report on Ground Investigations Report on Ground Investigations November 2023 identified peat in eight exploratory holes. The eight exploratory holes were generally noted as having 'dark brown peaty sandy topsoil' to a maximum depth of 0.40m bgl.
- A12-6.8.9. Peat was found at further depths in two locations; AAB-MTS-1002 was recorded as 'dark brown and black sandy amorphous peat' between 0.20m bgl and 0.50m bgl and AAB-MTS-1007 was recorded as 'Reddish brown very gravelly silty fine to coarse sand with low cobble content with pockets of sandy amorphous and rooty peat' between 0.15m bgl and 0.75m bgl.

A12-6.8.10. The locations of the eight exploratory holes from 2023 GI were situated within Glen Croe to the east of Croe Water and the west of the existing A83. The exact locations of boreholes can be seen in the Report on Ground Investigation November 2023.

A12-6.9. Summary of Ground Conditions

A12-6.9.1. In alignment with the NPF4 Policy 5d, this PMP presents and assessment of the baseline depth, habitat condition, quality and stability of carbon rich soils, the likely effects of the development on peatland, including soil disturbance, and the likely net effects of the development on climate emissions and loss of carbon.

A12-6.9.2. The following section provides a summary of ground conditions identified in previous Chapters.

A12-6.10. Peat

A12-6.10.1. The [James Hutton Institute 1:250,000 Soil Map of Scotland](#) indicates that the entirety of the Proposed Scheme is underlain by peaty podzol soils described as 'peaty gleyed podzols with peaty gleys and dystrophic semi-confined peat' (shown in Volume 3, Figure 12.8 – Peat Deposits underlying the Proposed Scheme).

A12-6.10.2. The 1:250,000 Soil Map of Scotland records the peaty podzols underlying most of the valley bottom and the surrounding slopes to the northeast and southwest of the Proposed Scheme. In addition, peaty ranker soils are also found on the slopes at higher elevations, which comprise an organic or organo-mineral surface horizon but lack subsoil.

A12-6.10.3. Although the PMP covers the Proposed Scheme, it only needs to be applied where peat is located. The [Carbon and Peatland Map 2016](#) indicates the Proposed Scheme boundary and 250m buffer is underlain by Class 3 and Class 5 peat (as shown in Volume 3, Figure 12.4 Peat Classification underlying the Proposed Scheme). No Class 1 deposits have been identified within the Proposed Scheme. Loch Restil in the north of the study area is non-

soil (Class -2), however this area has since been removed from the Scheme design. The peat classifications originate from the Carbon and Peatland Map 2016 and any future GI will be used to refine the assessment. A summary of the carbon and peatland importance classes is presented in Table 1.

Table 1 – Description and extent of peat classes in the Proposed Scheme boundary and 250 m buffer

Class	Description	Study area presence
Class -2	Non-soil (e.g., loch, built-up area, rock and scree).	Loch Restil (located west of the A83 in the north of the study area).
Class -1	Unknown soil type.	N/A (all peat in the study area is classified).
Class 0	Mineral soil - Peatland habitats are not typically found on such soils.	Upper slopes and summits of Beinn Luibhean and The Cobbler, in addition to Beinn an Lochain and Ben Donich.
Class 1	Nationally important carbon rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value.	On northeast-facing mid and upper slopes of Ben Donich, approx. 800 m south-west of the Proposed Scheme.
Class 3	Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon rich soils, with some areas of deep peat.	Lower slopes of Beinn Luibhean and The Cobbler. Eastern side and valley floor of Glen Croe. Underlies the majority of the A83 and OMR. North and west shores of Loch Restil.
Class 4	Area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon rich soils.	Mid-upper slopes of Beinn Luibhean, The Cobbler, Beinn an Lochain and Ben Donich.

Class	Description	Study area presence
Class 5	Soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon rich and deep peat.	Lower slopes of Beinn an Lochain and Ben Donich. Western side and valley floor of Glen Croe. Underlies parts of the A83 and OMR. Underlies the Rest and Be Thankful car park and the proposed cycle path to the south of the B828. South and east shores of Loch Restil.

A12-6.10.4. This PMP does not specify peat conditions due to the lack of available data. Section A12-4.15 outlines how the revised PMP can incorporate condition assessments.

A12-6.10.5. Due to the presence of peat within the study area and historic landslides, a Peat Stability and Landslide Hazard Risk Assessment (to be developed as part of the reporting following further GI and GIR) is to be undertaken, where sufficient information is available. This assessment will use probing depth data in combination with slope information to initially determine the risk of peat instability, based primarily on the factor of safety slope stability calculations in combination with consequence (receptor) evaluation. Specific areas are identified at an initial stage, and those areas with an initial risk level greater than low are then evaluated further, using geotechnical information and interpretation of aerial photography to refine the initial desktop assessment for each location. The additional information enables the evaluation of the potential extent and the identification of appropriate mitigation measures to reduce the revised risk level.

A12-6.11. Geology

Superficial Geology

- A12-6.11.1. BGS Mapping indicates the Proposed Scheme is underlain predominantly by superficial deposits of Glacial Till. Areas of alluvium and hummocky/glacial deposits are present within the valley to the southwest of the Proposed Scheme, while River Terrace Deposits are also present in the valley associated with Croe Water. A map showing superficial deposits underlying the Proposed Scheme can be seen in Volume 3, Figure 12.1 – Superficial Geology.
- A12-6.11.2. Made Ground is not recorded within the area of the Proposed Scheme. However, Made Ground (engineering fill) is expected to be present locally in association with the A83, local forest tracks and car parks.

Bedrock Geology

- A12-6.11.3. BGS Mapping indicates the Proposed Scheme is underlain predominantly by Neoproterozoic metamorphic bedrock in the form and Beinn Bheula Schist formation and is noted to be at or near the ground surface at numerous locations in close proximity of the A83, typically across the steep hillside.
- A12-6.11.4. An extensive igneous intrusion of the Siluro-Devonian South of Scotland Granitic Suite is situated between Beinn Luibhean and The Cobbler and underlays the southern extent of the Proposed Scheme.

A12-6.12. Hydrogeology

Superficial

- A12-6.12.1. The superficial deposits of Alluvium and River Terrace Deposits form low productivity aquifers if they predominantly comprise silt and clays. However, dominated by granular material (sands and gravel) the deposits have the potential to represent high productivity aquifers. Chapter 12 Geology, Soils and Groundwater outlines the impact of the Proposed Scheme on local hydrology.

A12-6.12.2. The faces of cut batters, especially in peat over 1 m, should be sealed to reduce water loss of the surrounding peat habitats which lead to indirect loss of habitat and release of greenhouse gases. This sealing may be achieved by peat compression to create an impermeable subsurface barrier, or where slope angle is sufficiently low, by revegetation of the cut surface. The Appointed Contractor will evidence this when they produce a detailed design and begin construction of the Proposed Scheme (evidenced in the MMP).

Bedrock

A12-6.12.3. The Beinn Bheula Schist bedrock formation is designated as a low productivity aquifer, where flow is fracture dominated and there are small amounts of groundwater in the near-surface weathered zone and secondary fractures.

A12-6.13. Peat and Carbon Impact Estimates

Estimated Volume of Peat to be Excavated

A12-6.13.1. Based upon the Proposed Scheme design (land take excluding the Biodiversity Net Gain and Natural Capital areas) subject to assessment, an estimated 30.75 hectares (ha) (307,464 m²) of Class 3 and Class 5 peat are anticipated to be excavated or disturbed for the Proposed Scheme. Thereby, no nationally significant carbon rich soils are disturbed.

A12-6.13.2. Notably, the Biodiversity Net Gain and Natural Capital areas are excluded from this assessment as it is assumed that any enhancement works will not impact peat. Future iterations of this PMP will consider these areas if enhancement works are found to impact peat.

A12-6.14. Carbon Considerations

A12-6.14.1. The Proposed Scheme crosses carbon rich soil and deep peat (Class 3 and Class 5), shown in Volume 3, Figure 12.4 Peat Classification underlying the Proposed Scheme.

A12-6.14.2. To consider the carbon impact of peat removal from the environment, carbon storage by weight is calculated, using soil carbon concentration (median value

of 202 g kg⁻¹ across the site shown on the [UK Soil Observatory \(UKSO\) Map Viewer](#)) multiplied by the median dry density of peat (90 kg m⁻³)⁴ to calculate the unit carbon storage of 18,180 g m⁻³. Using the study area (ca. 307,464 m²) and a nominal peat depth of 15 cm, the estimated conservative total of peat to be excavated is calculated to be approximately 46,100 m³. Multiplying this by the unit carbon storage total equates to approximately 825 tonnes of carbon stored in the soil within the Proposed Scheme footprint which stands to be excavated or otherwise disturbed during construction. These calculations are informed by estimates volumes of planned excavations and assumptions of median soil carbon concentration and peat depth on-site. The revised PMP will include an updated estimate for excavated peat volumes based on future GIs and peat probing.

A12-6.14.3. It is recommended that lost carbon storage is offset by re-using extracted peat on- or off-site (outwith the study area, respectively) as part of peatland habitat restoration works (Section A12-4.15).

A12-6.15. Peat Management

Approaches

A12-6.15.1. NPF4 outlines the Proposed Scheme should be designed and constructed in a manner that protects carbon rich soil from damage by following the mitigation hierarchy outlined below:

- Avoid: Remove the impact on peatland at the outset. Avoid excavating peatland, carbon-rich soils and priority peatland habitat, specifically peatland in near natural condition as this has the lowest greenhouse gas emissions of all peatland condition categories. The [Peatland Survey Guidance on Developments on Peatland \(2017\)](#) and [Peatland Condition Assessment](#) photographic guide indicate how to assess peat depth and quality, and condition, respectively. The revised PMP, following further GIs and peat surveys, should include an assessment of peatland condition within the study area to help identify areas to undertake peatland restoration.

- Minimise: Reduce the total area and volume of peat directly and indirectly disturbed on undeveloped land, including from compaction and erosion, and that minimises soil. Demonstrate how the infrastructure layout design has targeted areas where carbon rich soils are absent or the shallowest peat reasonably practicable. Avoid peat > 1m depth.
- Restore: Repair any habitats damaged by the Proposed Scheme (direct or indirect) as far as possible.
- Offset: Effectively restore and manage degraded equivalent habitat to compensate for any losses or residual impacts, with a preference for on-site over off-site measures.

A12-6.15.2. SEPA also outline a [hierarchy of management approach in relation to developments on peat](#) which relates closely to the NPF4 approach:

- Prevention – Minimise peat excavation and disturbance to prevent the unnecessary production of waste peat using a PMP.
- Reuse – Use of peat on-site in construction or reinstatement e.g., restoration of hardstanding areas, borrow pits, road verges, peatland restoration etc. or off-site to restore peatland areas.
- Recycling/recovery – Where peat cannot be used on-site or off-site for restoration it may be spread on land for agricultural benefit, recycled through blending with other materials to form a soil substitute or used in other relevant works.
- Disposal – Peat disposal is not acceptable for the Proposed Scheme development. The disposal of peat is not acceptable. All peat disturbed by the development of the Proposed Scheme can be used for on-site reinstatement (making good areas which have been disturbed by the development) or peatland restoration (using disturbed peat for habitat restoration or improvement works in areas not directly impacted by the development, which may need to include locations outwith the development boundary).

A12-6.15.3. Notably, the design optioneering phases pre-date NPF4 when the consideration of the impact on carbon-rich soils was not required. Refer to the

section on Storage below which outlines future considerations for, how the design minimises land-take and peat impact.

Mitigation Hierarchy

A12-6.15.4. This PMP outlines how the AWJV mitigates for impact on peat during the Proposed Scheme construction by aligning design and construction techniques to NPF4 mitigation hierarchy.

Avoid

A12-6.15.5. Where possible, avoid the disturbance on near natural condition and Class 1 peatland.

Minimise

A12-6.15.6. One of the key objectives for the Proposed Scheme design is to prevent or minimise the excavation of peat on-site, as far as reasonably practicable. This helps ensure that, as much as possible, the existing environment is protected, and the net carbon benefits of the study area are maximised. This has been achieved around Loch Restil.

A12-6.15.7. As part of the Proposed Scheme construction, there is a need to excavate areas of carbon rich soils adjacent to the existing A83 to allow for the construction of the debris flow shelter and to allow for slight realignments of the A83. Additionally, there is a need to excavate carbon rich soils to allow for the widening and realignment of the OMR. The full extent of the peat within these areas is still to be characterised following GI. Where peat is identified, it is likely that the load-bearing capacity in the peat will be too low for construction. Therefore, to ensure a safe structure can be implemented, any peat encountered will need to be excavated.

A12-6.15.8. The design process has sought to minimise the volume of material being excavated due to the financial and programme implications of managing unnecessarily excessive volumes of arisings. The decision-making process documents evidence of measures taken to prevent and reduce the volume of

material being excavated throughout the formulation of the design particularly in relation to providing the following:

- Justification for the extent of peat that needs to be excavated. Proof that this is only to allow the works to be undertaken safely to allow design objectives to be met and to show that other parts of the study area have been fully utilised during the works to accommodate storage of materials, plant etc.
- A clear construction plan detailing working methods, programme of all works and site zoning including all temporary materials storage areas. Any activities that may cause disturbance to the peat, including in areas that will not be excavated have been avoided where possible.
- The future production of a Materials Management Plan (MMP) to allow material and waste management decisions to be documented for future reference. Implementation of a MMP ensures reduction or reuse potential of material is maximised. The Contractor is responsible for producing the MMP for the Proposed Scheme.
- Robust briefing of suitably trained site operatives during works to reduce the potential for accidental over-dig of materials.
- Machinery should be re-fuelled in designated areas away from any watercourses or peatland habitats. Machinery and tools must be oiled and re-fuelled in an allocated area on hardstanding away from any vegetation and watercourses. Spill kits must be available on-site with staff trained on how to use them. An adequate quantity of oil absorbent material will be stored on-site and spillages cleared up immediately.
- Construction vehicles should only cross peatland habitats using rigid bog matting, to protect these from damage from rutting and compaction. The matting should be in place for only as long as needed to move vehicles to and from location.

A12-6.15.9. Refer to the section on Storage below which outlines where to find evidence to support adherence to these criteria.

A12-6.15.10. The existing road network includes several utilities including underground cables; it is assumed that these will be diverted or removed as part of the works, with new services potentially implemented. Diversions are recommended to follow the shortest possible routes to limit the volume of material to be excavated outside the excavation area.

Reuse

A12-6.15.11. It is understood that any extracted peat will be reused where possible although anticipated volumes that can be used on-site or off-site have not been calculated. All reuse options will be considered after future GIs and peat probing provide estimates on extracted peat volumes (to be outlined in a revised PMP). Further options for reuse on-site may be available as the works progress, given possible design changes.

A12-6.15.12. Where the excavation of peat cannot be prevented or avoided, the preferable management option is for the excavated peat and peaty soil to be reused in a suitable and environmentally beneficial way. In this respect, the following potential reuse opportunity can be considered on-site or, where this is not possible, at off-site locations:

- Re-use of peat on-site at the surface or shallow depth for landscaping/dressing where the former road has been removed to assist in creating tie-ins with the surrounding topography and landscape to reduce visual impacts.
- Re-use excavated and disturbed peat to enable local peatland habitat restoration to benefit nature and local stakeholders, subject to peat volumes and condition. Identified locations where the addition of excavated peat will enhance on- or off-site locations into functional peatland systems capable of achieving carbon sequestration. A peatland assessment would be required to inform a Peat Restoration Plan.

A12-6.15.13. Volume 4, Appendix 11.15 Outline Landscape and Ecological Mitigation and Management Plan outlines proposals for reuse of disturbed peat in landscaping.

A12-6.15.14. The reuse of peat in habitat restoration should be considered in a Peat Restoration Plan. The Plan should include details of restoration to compensate for the area of peatland habitat directly and indirectly impacted by the development, outline proposals for peatland enhancement in other areas of the study area, and monitoring proposals.

A12-6.15.15. For both landscaping and habitat restoration, the following information is required:

- location plan of the proposed peatland re-use restoration area(s), clearly showing the size of individual areas and the total area to be restored and
- photographs, aerial imagery, or surveys to demonstrate that the area identified is appropriate for peat re-use and can support carbon sequestration. This should include consideration of an appropriate hydrological setting and baseline peatland condition.

A12-6.15.16. If proposed re-use restoration areas are off-site, information should be provided to demonstrate agreement in principle with the landowner, including agreed timescales for commencement of the works, and proposed management measures to ensure the restored areas can be safeguarded in perpetuity as a peatland. To determine whether there is a risk of environmental harm, a site-by-site assessment of each restoration project is required. The assessment determines if the type of peat is suitable for the purpose, that the amounts proposed do not exceed the amounts needed to complete the project and that the management methods are suitable. [NatureScot Technical Compendium of Peatland Restoration Techniques](#) provides guidance on the procedural and technical requirements for peatland restoration.

A12-6.15.17. The following considerations should be accounted for in the reuse of peat where off-site reuse is considered:

- potential for transportation to degrade the quality of peat
- potential impacts from peat stability
- potential impacts on water quality and geomorphology of watercourses

- potential impacts on existing valuable ecological habitats and
- impacts on drainage and flood risk.

A12-6.15.18. [SEPA 2017](#) states that the reuse of peat can lead to several issues due to its low tensile strength and high-water content which requires consideration. For example:

- peat is likely to have a very low load-bearing capacity, making it a potential hazard to people or animals walking on it
- slides or movement are highly likely and can be caused by heavy rainfall and
- potential for contaminated run-off.

A12-6.15.19. A Peat Stability and Landslide Hazard Assessment (to be developed as part of the reporting following further GI and GIR) will be required to assess the extent of peat on-site and identify appropriate mitigation measures to reduce the risk level. Where off-site use is intended, evidence that these constraints have been considered and undergone the appropriate assessment to demonstrate suitability for use should be documented within the design process (responsibility of the Appointed Contractor).

A12-6.15.20. The MMP (to be developed by the Appointed Contractor) will outline definitive reuse opportunities about the following aspects:

- the nature and location of the reuse site(s)
- the volume and type of materials that can be reused at each site
- a timeframe and supporting information detailing when this reuse opportunity will be available and storage intentions where there will be a lag between excavation and reuse
- any additional works that will be needed to supplement this reuse opportunity e.g. chemical testing, pre-treatment measures (see below) or any liaison with specialists/regulators and

- the plan should also document attempts made to identify reuse opportunities where a surplus of materials that cannot be reused is created.

A12-6.15.21. [SEPA's Land Remediation and Waste Management Guidelines](#) provide information on scenarios where the reuse of site-won material is and is not acceptable. These points are summarised as follows:

- the use is a necessary part of the planned works
- the material is suitable for that use
- the material does not require any processing or treatment before it is reused
- no more than the quantity necessary is used
- the use of the material is not a mere possibility but a certainty and
- the use of the soil will not result in pollution of the environment or harm to human health.

A12-6.15.22. Refer to the section on Storage below which outlines where to find evidence to support adherence to these criteria.

Offset

A12-6.15.23. This PMP aligns with the A83 ESG feedback on the scope of the EIA that restoration to achieve offsetting (i.e. compensation rather than biodiversity enhancement) would be in the order of 1:10 (lost:restored), i.e. 1ha loss of peatland should result in measures to restore 10ha of peatland and that to achieve enhancement, an additional 10% of the baseline assessment of the extent of priority peatland habitat would be required. See the Reuse and Restore section above which outlines how restoration will be undertaken, monitored and recorded.

A12-6.16. Geotechnical Constraints

A12-6.16.1. Given the peaty nature of the excavated materials and the presence of occasional pieces of anthropogenic materials and wood (Section A12-4.7), it is

unlikely that the excavated materials will be suitable for reuse within structural applications.

A12-6.17. Pre-Treatment

A12-6.17.1. Due to its higher water content and very low tensile strength, peat is generally difficult to manage. If used directly for restoration or landscaping, this material could lead to several issues including low bearing capacity, propensity to slide off slopes and potential to release water with high suspended solids content. The Peat Stability and Landslide Hazard Assessment (to be developed once the GI has been completed) will address these issues. Pre-treatment can be undertaken to provide a more stable combined structure through drying and mixing with peaty soils. This will require discussion with the relevant statutory body over the suitability of pre-treatment options and subsequent reuse. Information about the pre-treatment of the peat arisings will be documented in the MMP (to be produced by the Contractor as part of a CEMP).

A12-6.17.2. In terms of pre-treatment of peat, mixing with soils may lead to problems, such as improper mixing leading to pockets of peat which may affect stability, the peat may not meet the British Standard ([BS3882:2015](#)) requirements for certain nutrient levels for use as a planting medium and, once peat is removed, both its geo-environmental and geo-technical properties are likely to change and the peat may become unpredictable. Due to the lack of GI testing, further testing of the peat may be needed to demonstrate suitability for use where pre-treatment is undertaken. Notably, peat tends to shrink after excavation as water content decreases.

A12-6.18. Storage

A12-6.18.1. Handling and temporary storage of peat will be minimised. Temporary storage of peat will be required for any peat that is intended for reuse or recycling potential. Where any excavated peat will be reused, then it will not be classed as waste and no licencing will be necessary. The MMP will outline storage requirements (on-site and off-site) for any peat extracted during the Proposed

Scheme construction. The Appointed Contractor will be responsible for aligning and evidencing that the MMP aligns with the mitigation hierarchy.

A12-6.18.2. [SEPA 2017](#) states that *“well managed temporary storage of excavated waste peat at the excavation site will not require authorisation from SEPA. However, care must be taken to ensure the peat storage does not cause environmental pollution...It is also important to use the peat as soon as possible after excavation (to minimise the exposure of the peat to the air) and to maintain moisture conditions in the peat to keep carbon losses to a minimum. If the excavated peat is stockpiled with no certainty of use or becomes unsuitable for use for any reason it will be classed as waste and an authorisation will be required.”*

A12-6.18.3. Where no reuse or recycling opportunity has been identified and the peat is classed as waste, [SEPA’s regulatory position statement](#) states that *“the on-site storage of waste peat is likely to require a waste management licence or suitable exemption and if the storage prior to treatment or recovery period exceeds three years (or where storage prior to disposal is for more than one year) then a permit in accordance with the Landfill (Scotland) Regulations 2003 will likely be required”*.

A12-6.18.4. [SEPA 2017](#) states the storage of peat should be based on the following guiding principles and good practice methods:

- different types of peat (acrotelmic, catotelmic and amorphous) and other soils should be stored separately. Catotelmic peat should be kept wet, covered by vegetated turves and re-used in its final location immediately after excavation. It is not suitable for use in verge reinstatement, re-profiling/ landscaping, spreading, mixing with mineral soils or use in bunds. The 2023 GI indicates that fibrous peat and non-peat materials will be excavated (Section A12-4.15), however, due to the heterogeneous mixture of the materials it may not be possible to isolate and store them separately

- suitable storage areas should be located in areas with lower ecological value (e.g., away from Groundwater Dependent Terrestrial Ecosystems (GWDTEs), low stability risk areas and at a minimum distance of 50 m from watercourses
- larger stockpiles are preferable to numerous small stockpiles, to minimise exposure to sun and wind, which can lead to desiccation
- storage as close as practicable to the excavation location and/or planned reuse location
- pollution prevention measures should be installed around peat storage areas e.g. bunding to collect runoff and leachate from the stockpile and
- transportation of peat and re-handling of material should be minimised to limit disturbance, exposure to sun and rain and potential for mixing with other materials.

A12-6.18.5. Evidence to support adherence to these criteria is shown by the proposed design (Chapter 4 – The Proposed Scheme) that evolved to minimise land-take and peat impact through the adaptation of existing roads. The MMP (responsibility of the Appointed Contractor) will demonstrate the following:

- that construction works have been programmed in a way that minimises the duration and amount of peat that needs to be stored, and that where stored, exposed surface area will be minimised
- that construction work undertaken within the required seasonal window for peatland restoration, or that an Ecological Assessment has been conducted to confirm that any restoration works being undertaken as part of the Proposed Scheme will not negatively impact on ecological receptors
- that storage areas will be sufficient to store all arisings with appropriate segregation
- measures that have been implemented to prevent exposure of arisings to sun and rain and the creation of pollution and
- storage areas should be demonstrated to be large enough to store all arisings and should not be prone to conflict with Proposed Scheme works to avoid the need for double handling of materials.

Recycling/Recovery

- A12-6.18.6. [SEPA 2017](#) states that surplus peat may be “*spread on land for agricultural benefit, recycled through blending with other materials to form a soil substitute or used in other relevant works*”. Where surplus materials are anticipated, and on- or off-site reuse is not possible, then agricultural use should be considered. Details of attempts to utilise this opportunity will be documented in the MMP as appropriate. Note, the Contractor is responsible for aligning and evidencing that the MMP aligns with the mitigation hierarchy.
- A12-6.18.7. As specified by [SEPA 2017](#), such an activity will require a waste management licence or registration as an exempt activity and compliance with the legal requirements. Any application for licencing or exemption should be made sufficiently early to minimise the requirement for storage of peat on-site.

A12-6.19. Conclusions and Recommendations

- A12-6.19.1. The management, re-use and restoration of peat during the Proposed Scheme construction will be crucial to successfully retaining landscape character and ecosystem dynamics, preventing the degradation surrounding carbon rich soils and minimising the carbon emissions and sequestration impact.
- A12-6.19.2. This PMP aligns with the NPF4 Policy 5 by ensuring the Proposed Scheme design and construction align with the mitigation hierarchy and protect soils from damage, the Proposed Scheme is essential infrastructure and peatland habitat restoration is taking place, and a detailed assessment for the study area considers the baseline depth, habitat condition, quality and stability of carbon rich soils, the likely effects of the development on peatland, and the likely net effects of the development on climate emissions and loss of carbon.
- A12-6.19.3. Previous GIs have identified peat and peaty soils within the study area. Where peat extraction is required for the Proposed Scheme, the mitigation hierarchy is followed to avoid extraction where possible, minimise the impact, reuse the peat in landscaping or offset the impact by restring peatland habitat.
- A12-6.19.4. Conservative estimations suggest as much as 46,100 m³ of peat, storing as much as 825 tonnes of carbon, could be disturbed by the Proposed Scheme development.
- A12-6.19.5. Further GIs and peat probing are required to characterise the extent, depth, type and condition of peat across the Proposed Scheme study area to inform a revised PMP, support an associated Peat Restoration Plan, and help develop and refine carbon assessments.
- A12-6.19.6. An MMP, to be produced by the Appointed Contractor, is required to ensure that statutory materials and waste management requirements are implemented during the Proposed Scheme construction.