FEARNA STORAGE

Fearna Pumped Storage Hydro Scheme
EIA Report

Appendix 12.1 – Peat Landslide Hazard & Risk Assessment

February 2025

Quality Information

Prepared by	Checked by	Approved by
SLR	Chris Pasteur	Fraser Allison

Revision History

Revision	Revision Date	Details	Authorised
01	February 2025	Issue to ECU	Fraser Allison

Technical Appendix 12.2: Peat Management Plan

Fearna Pump Storage Scheme

Fearna Storage Limited

Prepared by:

SLR Consulting Limited

No. 50 Stirling Business Centre, Wellgreen, Stirling,
FK8 2DZ

SLR Project No.: 428.013028.00001

28 February 2025

Revision: 0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
0	28 February 2025	R. Watson	A. Huntridge	G. Robb

Basis of Report

This document has been prepared by SLR Consulting Limited (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with Fearna Storage Limited (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

SLR shall not be liable for the use of or reliance on any information, advice, recommendations and opinions in this document for any purpose by any person other than the Client. Reliance may be granted to a third party only in the event that SLR and the third party have executed a reliance agreement or collateral warranty.

Information reported herein may be based on the interpretation of public domain data collected by SLR, and/or information supplied by the Client and/or its other advisors and associates. These data have been accepted in good faith as being accurate and valid.

The copyright and intellectual property in all drawings, reports, specifications, bills of quantities, calculations and other information set out in this report remain vested in SLR unless the terms of appointment state otherwise.

This document may contain information of a specialised and/or highly technical nature and the Client is advised to seek clarification on any elements which may be unclear to it.

Information, advice, recommendations and opinions in this document should only be relied upon in the context of the whole document and any documents referenced explicitly herein and should then only be used within the context of the appointment.

Table of Contents

Tables in Text

Figures

Annexes

1.0 Introduction

1.1 General

SLR Consulting Ltd (SLR) was commissioned by Fearna Storage Limited (the Applicant) to undertake a Stage 1 Outline Peat Management Plan (PMP) at the proposed Fearna Pump Storage Scheme (hereafter referred to as the "Proposed Development"). The Proposed Development is split into two separate areas which will be referred to throughout this report as the PSH site and the Southern Access Route (SAR). The location and layout of the Proposed Development are detailed on **Figure 12.2.1** and **Figure 12.2.2** with the red line defining 'the site boundary'.

The Proposed Development would be situated within the boundaries of several landholdings approximately 25km to the west of Invergarry. Access to the Proposed Development during construction phase would be from the A87 along a route south of Loch Garry, passing through commercially forested areas before traversing open moorland to the PSH. The final section of access to the PSH would be along the existing public road, the C1144, which would be widened locally. The main PSH works, comprising the upper and lower reservoirs and associated works, are situated approximately 1km to the west of the Quoich Dam.

The Proposed Development would operate by transferring water between a lower reservoir, the existing Quoich reservoir, and an upper reservoir created by raising the level of Loch Fearna. The reservoirs would be connected by a system of underground waterways, with the turbines located in shafts within a powerhouse structure by the shore of the Quoich reservoir. The generating capacity of the scheme would be up to 1,800MW, with enough storage with the upper reservoir full to generate for approximately 20 hours at this capacity.

Full details Proposed Development are provided in **Chapter 2: The Proposed Development** of the EIA Report.

1.2 Site Description

The Proposed Development PSH site comprises south and southwest-facing slopes and corries of upland blanket mire, heathland, and flush habitat; burns with associated riparian woodland; acid grassland, bracken, mire, and heath habitats in the lower-lying ground and a rock shingle beach along the shoreline of Loch Quoich. M15 wet heath is the most widespread community within the survey area, followed by M17 blanket bog, and M25 mire.

The Proposed Development is located entirely within the upper catchment of the River Garry. Loch Fearna outfalls via the Allt Fearna to Loch Quoich as does the adjacent Coire Dubh via the Allt Mheil. Loch Quoich was dammed in the 1950s at both its east and west ends to create the storage for the Quoich Hydro project. Loch Quoich operates on a 26m vertical range, therefore, is already subject to significant modification by hydropower infrastructure including dams, a reservoir with fluctuating water levels and associated drawdown scarring, an intake tower, control building and a power station downstream.

The Proposed Development is used for highland sports, commercial forestry, hydroelectric generation and recreation. The Applicant is working closely with landowners to ensure any potential adverse effects on their existing interests are minimised.

The layout of the Proposed Development is detailed on **Figure 12.2.2.**

1.3 Objectives

This Peat Management Plan (PMP) outlines the overall approach of minimising disruption to peatland, and it aims to ensure that all further opportunities to minimise peat disturbance and extraction would be taken during detailed design and construction of the development.

The PMP provides details on the approximate predicted volumes of peat as defined in 1.5.3 that would be excavated during construction of the permanent infrastructure, the characteristics of the peat that would be excavated, and the principles of how and where this excavated peat would be stored, managed and reused for restoration.

Soils which are temporarily removed and stored within working corridors are not assessed in the PMP as they would be replaced, from where they were removed, on completion of the adjacent permanent construction works. The principles presented in Section 4.0, regarding the safeguarding of peat, their storage and placement, apply equally to both peat and soils from the working corridors and those removed from the footprint of permanent infrastructure.

The PMP has been developed to demonstrate that peat management and quantification has been afforded significant consideration during the construction phase of the Proposed Development. It aims to propose mitigation measures where technically feasible that would minimise any impacts and includes the areas proposed for re-use in long-term habitat restoration and management plans as outlined below.

The PMP seeks to identify appropriate proposals to re-use the excavated peat that can be accommodated within the Proposed Development and associated **Outline Biodiversity Enhancement and Management Plan (OBEMP)** provided in **Chapter 8, Appendix 8.7 of the EIA**, without significant environmental or health and safety implications, to minimise risk in terms of carbon release and human health.

1.4 Role of the Peat Management Plan

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

Stage 1: Environmental Impact Assessment (EIA)

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

Stage 2: Post Consent / Pre-Construction

The peat mass balance calculations may be further developed prior to the works commencing, following detailed ground investigation or further survey works required to inform detailed design, or that may be required under planning consent conditions.

Stage 3: Construction Stage

Actual peat volumes excavated during construction will be recorded against the overall predicted volumes. Within micrositing allowances, the alignment and design of tracks, tower foundation and associated construction methods will be reviewed to avoid/minimise peat disturbance as much as possible considering the more detailed information available once construction commences. A regular review and update of the peat mass balance table will be undertaken by the appointed Principal Contractor and monitored by the Environmental Clerk of Works (EnvCoW) on-site and made available to regulators as required.

1.5 Legislation and Guidance

The PMP has been compiled in accordance with the following legislation and best practice guidance:

- National Planning Framework for Scotland 4 (NPF4) (Scottish Government, February 2023);
- SEPA Regulatory Position Statement - Developments on Peat (Scottish Environment Protection Agency, 2010);
- Good Practice During Wind Farm Construction, NatureScot (July 2024)[1];
- Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste (Scottish Renewables and SEPA, 2012);
- Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Scottish Government, January 2017);
- Floating Roads on Peat - Report into Good Practice in Design, Construction and Use of Floating Roads on Peat with reference to Wind Farm Developments in Scotland (Forestry Commission Scotland & Scottish Natural Heritage, 2010);
- The Waste Management Licensing (Scotland) Regulations 2011; and
- Developments on Peat and Off-Site Uses of Waste Peat (SEPA, 2017).

1.5.1 Requirements of National Planning Policy 4

The intent of Policy 5 (Soils) of National Planning Policy 4 (NPF4)[2] is "*to protect carbon rich soils, restore peatlands and minimise the disturbance of soils from development*".

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

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

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

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

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

1 NatureScot (July 2024), Good Practice During Wind Farm Construction. https://www.nature.scot/doc/good-practice-during-wind-farm-construction

2 Scottish Government (2023). https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2022/11/national-planning-framework-4-revised-draft/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4-revised-draft.pdf

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

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

This stage 1 PMP considers the protection and safeguarding of peat and seeks to fulfil the requirements of Policy 5(d) with further detail on peatland habitat and peatland restoration provided in **Chapter 8, Appendix 8.7: OBEMP.**

1.5.2 Mitigation Hierarchy

SEPA[3,4] has published guidance regarding the mitigation hierarchy for developments on peat which is summarised below:

- Prevention – avoiding generating excess peat during construction (e.g., by avoiding peat areas or by using construction methods that do not require excavation such as floating tracks);
- Re-use – use of peat produced on-site in restoration or landscaping, provided that its use is fully justified and suitable;
- Recycling / Recovery / Treatment – modify peat produced on-site for use as fuel, or as a compost / soil conditioner, or dewater peat to improve its mechanical properties in support to re-use; and
- Storage – storage of peat up to a depth of 2 m is not classified as a waste and does not require authorisation from SEPA, however care must be taken to ensure that it does not cause environmental pollution.

The site design has been an iterative process and has evolved following review of peat depth, condition and ecological data. Key elements of the Proposed Development including dams, track, site compounds and borrow pits have been moved and adjusted to avoid impacting areas of peatland where possible. Details of the design iterations to avoid areas of peatland in accordance with the mitigation hierarchy are provided in **Chapter 3: Consideration of Alternatives and Design Evolution** of the EIA report.

1.5.3 Definition of Peat

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

- Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland Section 3.3 which states that "*Peat soil is*

3 Scottish Environment Protection Agency. 2010. Regulatory Position Statement – Developments on Peat.

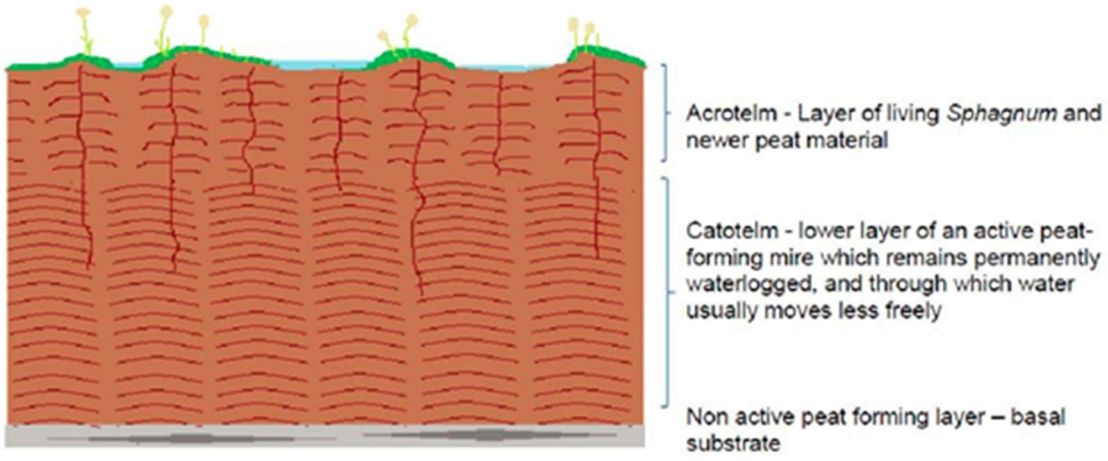
4 Scottish Renewables, Scottish Environment Protection Agency. 2012. Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste.

an organic soil which contains more than 60 percent of organic matter and exceeds 50cm in thickness."

- Scottish Government. Scotland's Soils. Soil Survey of Scotland *"Peaty soils have an organic layer at the surface which is less than 50 cm thick"*
- The Macaulay Land Use Research Institute define shallow peat as having "*a prescribed depth of organic matter of 50 – 100 cm"*

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

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



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

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

2.0 Desk Based Review

2.1 Site Description

The Proposed Development is located approximately 25 km west of Invergarry centred on National Grid Reference (NGR) NH 05846 02443. The Proposed Development is split into the PSH, located at Loch Fearna, and the SAR. The SAR access spans from the A87 at White Bridge which is situated to the south of Loch Garry, passes through generally commercially forested areas before traversing open moorland and crossing the River Garry further west. The final section of the access to the PSH will be along the existing public road (the C1144) which would be widened locally.

The main PSH site, comprising the upper and lower reservoirs and associated works, are situated approximately 1km to the west of the Quoich Dam. This area comprises south and southwest-facing slopes and corries of upland blanket mire, heathland, acid grassland, bracken, mire, and heath habitats in the lower-lying ground and a rock shingle beach along the shoreline of Loch Quoich.

2.2 Topography

From review of OS mapping, the PSH site ranges from 614 to 210 m AOD along the banks of Loch Quoich. The PSH track is situated across steep slopes in the southern extents, traversing northwards at an elevation of approximately 400m, before climbing the steep slopes to the southeast of Coire Mheil. At Loch Fearna, there are flatter expanses around the perimeter situated at approximately 540m AOD. Beyond the flatter expanses, Loch Fearna is surrounded by moderate to sleep slopes belonging to the southern flanks of Spidean Mialach, Coire Glas and localised topographical highs. In addition, much of the PSH site is situated in the Allt a Mheil valley which rises from approximately 350m AOD near the southern area of the PSH track up to approximately 600m near Coire Dubh.

The SAR is predominantly situated in a lower topographical area with gentle slopes and minor topographical highs. The western extent of the SAR, the proposed C1144 public road widening, is situated across steep, open slopes between 180 and 220m AOD. The proposed public access route to Kingie then crosses over the River Garry onto flatter expanses at approximately 150m AOD before traversing moderate slopes towards the commercial forestry further southeast.

2.3 Peatland Classification

The Carbon and Peatland Map 2016[5] indicates that most of the Proposed Development PSH is underlain by Class 3 and Class 5 peat with localised areas of Class 2 and Class 4. Class 3 peatland is the primary peatland surrounding Loch Fearna. Class 3 peatland is not considered to be priority peatland, but it is associated with wet acidic type soils where occasional peatland habitats can be found with carbon-rich soils and some areas of deep peat. Class 5 peatland is mapped across areas in the north of the PSH site across Coire Dubh and throughout areas of the Proposed PSH Track to the south of Coire Mheil. A localised area of Class 2 peatland is mapped on the descending slope to the west of Loch Fearna and throughout areas of the Proposed PSH Track descending towards the existing C1144. Class 2 peatland is dominated by priority peatland habitats where all soils are carbon-rich and deep peat. Class 4 peatland is mapped across areas of the Proposed PSH Track to the western extents of the PSH. Class 4 is unlikely to be associated with peatland

5 NatureScot, Carbon and Peatland Map 2016, Available online at: map.environment.gov.scot/soil_maps/

habitats, wet and acidic type and is unlikely to include carbon-rich soils. In addition, Mineral soils are mapped throughout the steeper extents of the PSH, predominantly across the southern flanks of Spidean Mialach and Coire Glas, southwest of Loch Fearna and on the southern flanks of Creag Coire na Fiar Bhealaich.

Similarly to the PSH, the SAR is predominantly underlain by Class 2, Class 3 and Class 5 peatland. The western extents of the SAR is underlain by areas of Class 2 and 3 peat, whilst the remainder of the route is predominantly Class 2 and 5. In addition, there are localised areas of mineral soils throughout the SAR and localised areas of Class 1 peat are present to the south of Loch Garry and Laddie Wood, adjacent to the Allt Ladaidh watercourse. In addition, towards the eastern extents of the SAR, there are areas of Class 4 peatland mapped.

BGS Online data[6] records indicate that there is no risk regarding the mass movement or instability of materials.

2.4 Hydrology

Information from SEPA's Water Classification Hub[7] indicates that there the Proposed Development is situated in several catchment areas. The PSH site is located within the Loch Quoich catchment. There is a network of unnamed watercourses feeding Loch Fearna, with Allt Fearna as the outflow which flows southwards and drains into Loch Quoich. In addition, there is the Allt a Mheil which flows predominantly southwards in the western extents of the PSH to Loch Quoich. There are various minor surface watercourses situated to the south of Loch Fearna which cross the Proposed PSH Track and the existing C114 road.

The SAR is situated within various hydrology catchment areas, listed from west to east:

- Unnamed tributary of River Garry DWPA
- River Kingie Catchment
- Allt Choire a Bhalachain Catchment
- Allt Lon Glas Bheinn Catchment
- Greenfield Burn Catchment
- Allt Ladaidh Catchment
- Allt na Cailliche Catchment

In the western extents of the SAR, the proposed tracks cross the River Garry which a major river draining Loch Quoich flowing southeast and east through Loch Garry before discharging into the Loch Oich further east outwith the Proposed Development. Throughout the remainder of the SAR, there is a series of watercourses that cross the tracks, generally associated with the River Garry and Loch Garry.

2.5 Hydrogeology

Information from Scotland's Environment Online Map Viewer[8] indicates that the Proposed Development is underlain by the Northern Highlands Groundwater body (ID: 150701) and is classified as having a 'good' overall status, as part of the most recent information available from SEPA (2020).

6 BGS Online Viewer, available at [https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.133433804.376188765.1646739904-1030004651.1646739904]

7 SEPA, Water Classification Hub, available online at: https://www.sepa.org.uk/data-visualisation/water-classification-hub/

8 Scotland's Environment, Scotland's Environment Map, Available online at: https://map.environment.gov.scot/sewebmap/

The PSH site is underlain by the Glenfinnan Group, whilst the SAR is predominantly underlain by the Loch Eil Group and an Unnamed Igneous Intrusion. These aquifers are all classed low productivity, indicating that small volumes of groundwater are present in near surface weathered zones and secondary fractures, and flow within the aquifer is predominantly through fractures and other discontinuities.

2.6 Sensitive Receptors

Information from Scotland's Environment Online Map Viewer[8] indicates that the Quoich Spillway, classified as a Site of Special Scientific Interest (SSSI) and Geological Conservation Review (GCR), is situated adjacent to the western extents of the SAR at the Proposed Development. There are no other designated sites mapped within the Proposed Development PSH and SAR.

The West Inverness-shire Lochs SSSI and Special Protection Area (SPA) is located 5 km downstream of Quoich Dam, and approximately 1.2 km north of the SAR.

In addition, a National Vegetation Classification (NVC) habitat mapping exercise has been completed as part of the ecology baseline assessment to identified potential GWDTEs within the Proposed Development. The full methodology and results of this exercise are discussed in detail in **Chapter 8: Terrestrial Ecology**. The types of NVC Communities identified included M6, M23, M25, M29 and W4 with high GWDTE potential and M15 with moderate GWDTE potential. The exercise concluded that the potential high and moderate GWDTEs are generally situated within watercourse corridors and across ground underlain by peat and glacial till deposits. This distribution is not typically sustained by emerging groundwater, such as springs or seepage lines.

3.0 Site Work

3.1 Peat Depth Survey

Peat depth surveys have been undertaken across four of phases by SLR and are detailed within **Technical Appendix 12.1 Peat Landslide Hazard Risk Assessment (PLHRA)**.

The surveys carried out followed best practice guidance for developments on peatland[9,10]. Phase 1 peat probing resulted in initial low resolution probing on an approximate 100m grid in areas of mapped peatland and potential areas of peatland proposed for development and included accessible areas of inundation. This data allowed initial assessment of the extents of peatland within the main areas of the Proposed Development which was used in preliminary site layout designs. Multiple phases of higher density probing saw detailed probing undertaken across the Proposed Development in areas of infrastructure and peat typically >0.5m, focusing on access tracks at 50m intervals and infrastructure typically at a density of 10m x 10m with some larger extensive infrastructure areas (Borrow Pits and Inundation areas) on 25 x 25m density. Following review of aerial imagery and DTM data, Phase 1 probing was typically not undertaken on a 100m grid in areas of exposed bedrock and steep slopes outwith areas of proposed infrastructure. The density of peat probing undertaken is considered appropriate to confirm the extents of peatland within the area of the Proposed Development.

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

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

- Solid and abrupt refusal – rock;
- Solid but less abrupt refusal with grinding or crunching sound – sand or gravel or weathered rock;
- Rapid and firm refusal – clay; or
- Gradual refusal – dense peat or soft clay.

SLR made an assessment of the substrate and recorded this at each probe hole.

The relative stiffness of the peat was also assessed from the resistance to penetration of the probe and to the effort required to extract the probes (retrieval of the probe was often impossible for one person). In all instances, refusal was met on obstructions allowing identification of subsurface geology.

9 Scottish Renewables & SEPA (2012) ‘Developments on Peatland Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste’.

10 Scottish Natural Heritage (SNH), SEPA, Scottish Government & James Hutton Institute. (2014)’ Peat Survey Guidance; Developments on Peatland: Site Surveys’.

3.2 Peat Depth Results

The results from all probing exercises listed above in Section 2.1 are detailed in the following sections and the peat depths identified on-site are shown in **Figure 12.2.3 and Figure 12.2.4** for peat >0.5m with a detailed Peat Depth Plan provided in **Figure 12.2.5.**

The peat was found to vary across the Proposed Development in terms of thickness and coverage. Deeper peat was generally encountered in flatter, lower gradient areas of the Proposed Development. The maximum depth of recorded peat was 3.6 mbgl, recorded at two locations, north of Loch Ferna and adjacent to the SAR. The average thickness of peat recorded across the Proposed Development was 0.4 m.

A total of 20,354 peat probes were undertaken across all survey phases, with the results summarised in Table A with all probing data provided in Annex A.

Table A: Peat Probing Results

Peat Thickness (m)	No. of Probes	Percentage (of total probes undertaken on-site)
0 (no peat or soil)	2583	12.7
0.01 – 0.49 (peaty soil)	11525	56.6
0.50 – 0.99	3692	18.1
1.00 – 1.49	1683	8.3
1.50 – 1.99	577	2.8
2.00 – 2.49	204	1.0
2.50 – 2.99	81	0.4
3.00 – 3.49	7	0.0
3.50 – 3.99	2	0.0
> 4.0	0	0.0

3.3 Physical Peat Condition

Peat core locations were selected to specifically target areas where peat depths had previously been recorded that exceeded 1m throughout the final design evolution. Peat samples were collected by SLR in July 2023 to inform interpretations of the peat condition and underlying substrate. Peat samples were collected using a peat corer and logged using BS5930 and the von Post classification[11].

The peat encountered throughout the Proposed Development was generally described as brown to dark brown, fibrous to pseudo-fibrous peat, between H2 and H4 on the von Post classification, showing insignificant to moderate decomposition. The peat encountered throughout the Proposed Development is predominantly well drained and dry with bare peat exposed in some areas that is associated with extensive gully erosion evident.

The peat encountered throughout the Proposed Development is predominantly well drained and dry with bare peat exposed in some areas that is associated with extensive peat erosion.

11 Von Post, L. and Grunland, E., (1926), 'Sodra Sveriges torvillganger 1' Sverges Geol. Unders. Avh., C335, 1-127.

The peatland was typically observed to be typically actively eroding condition around the more extensive areas of peatland around Loch Fearna.

Peat Core logs and photographs are presented within **Annex B**.

The Peat Condition plan is provided in **Chapter 8, Terrestrial Ecology**.

Table B below provides details of the main infrastructure and confirms if this infrastructure location is located on or adjacent to areas of peat. The definition of peat is detailed in Section 1.5.3 as defined by a recorded thickness of >0.5m, review of the peat core samples and supported by a review of NVC mapping and site observations during the peat probing and ecological survey works. Infrastructure not located on peat are recorded to be underlain by organic (peaty soils/carbon rich soils) or soft mineral soils <0.5m.

Table B: Infrastructure Located on Peat (>0.5m)

Infrastructure	Peat Depths Recorded >0.5m within infrastructure excavation footprint	Average Peat/Soil Depth (m) within infrastructure footprint	Peatland /Mire Habitats NVC Code at or adjacent to infrastructure footprint
Allt Ladaidh Road and Bridge Realignment	No	0.15	-
Borrow Pit (min operation level)	Yes	0.63	M15, M17
C1144 Public Road	No	0.12	-
Dam Spillway North	Yes	0.24	M15
Dam Spillway South	Yes	0.33	M15
Dam Structure North	Yes	0.36	M15, M17
Dam Structure South	Yes	0.66	M15, M17
Dam Valve House North	No	0.31	M15
Dam Valve House South	Yes	0.34	M17
Powerhouse Hardstanding	No	0.09	M17
Poulary East BP	No	0.06	M15 to the west.
Powerhouse	No	0.13	M25
Powerhouse Access Track	No	0.18	M25
PSH Track	Yes	0.38	M15, M17
Public Path Diversion	No excavation.	-	-
Site Compound 1	Yes	0.26	M15
Site Compound 2	Located within Powerhouse Footprint.	-	-
Site Compound 3	Located within Borrow pit (min operating level)	-	-
Southern Access to Kingie	Yes	0.33	M15
Switchyard	Located within Powerhouse Footprint.	-	-
Temporary Construction Access	Located within Borrow pit (min operating level) / DAM	-	-
Upper Inlet/Outlet	Located within Borrow pit (min operating level) / DAM	-	-
Large Passing Place	Yes	0.57	M15
Small Passing Place	Yes	0.25	M15
Proposed Bridge (North)	No	0.2	M15
Proposed Bridge (South)	No	0.12	M15
Proposed Rock Armour	No	0.13	-
Proposed Powerhouse Landscaping and planting	Yes	0.18	M25

Infrastructure	Peat Depths Recorded >0.5m within infrastructure excavation footprint	Average Peat/Soil Depth (m) within infrastructure footprint	Peatland /Mire Habitats NVC Code at or adjacent to infrastructure footprint
Proposed Hardstanding Control Building	Yes	0.39	M17
Proposed Post and Wire Fence	Yes	0.34	M15, M17
Glen Kingie BP	No	0.1	M25
Kingie Estate BP	No	0.1	M25

Table B has confirmed areas of infrastructure are located on areas of peat and/ or peat soils and in areas of peatland habitat and will include excavation of peat and peaty soils / carbon rich soils which will be required to be managed and appropriately mitigated during the construction phase.

The following sections of the report provide details on the potential impacts to peat during construction and provide details of mitigation, management and re-use of excavated peat and are also applicable for the protection of carbon rich soils.

The following locations are located within other infrastructure footprints, require no excavations in close proximity to shorelines or shallow bedrock and or thin mineral soils and have been excluded from further consideration within this report as a source of excavated peat;

- Allt Ladaigh Road and Bridge Re-alignment
- Powerhouse Access Track
- Public Path Diversion
- Site Compound 2
- Site Compound 3
- Temporary Construction Access
- Switchyard
- Upper Inlet
- Proposed Rock Armour

4.0 Potential Impacts on Peat During Construction

The initial construction phase will include soil and peat stripping and excavation activities associated with constructing the foundations for infrastructure such as dams, powerhouse building platform, access tracks, compounds and borrow pits.

There are four main types of impact on peat which can occur during construction. These are:

- Loss of structural integrity and peat strength, due to stripping off or damaging the surface vegetation turf, excavation, handling and transporting peat (particularly wet, subsurface peat);
- Erosion and gullying, caused by exposure and desiccation of bare peat surfaces primarily caused by water erosion, due to surface runoff after rainfall;
- Contamination, caused by leaks, spillages or inappropriate laydown of materials; and
- Peat slide, caused by laying wet peat on top of wet peat, laying other heavy materials (including excavated mineral soil or other construction materials) on top of wet peat or by inappropriate stockpiling, such as attempting to create stockpiles of peat that are too high, without bunding, engineering or geotechnical support.

A range of methods and control measures are described below which are designed to prevent these impacts from occurring.

5.0 Peat Management

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

The Proposed Development has sought to avoid areas where peat is >1m and efforts have been made through the iterative design process to minimise the footprint of site infrastructure requiring excavation on peat >0.5m as far as practicable as detailed within **Chapter 3: Consideration of Alternatives and Design Evolution.**

Where peat >0.5m and peat soils are present in areas of infrastructure to be excavated, re-used, reinstated for landscaping and for peatland restoration with the intention that its supported habitat continues to be viable where possible, the following good practice outlined in the sections below applies. It is proposed that these principals will be developed further as part of a Stage 2 PMP assessment in agreement with SEPA following detailed site design.

Excavated peat from permanent infrastructure within the inundation area would be re-used where possible outwith the inundation area.

Excavated peat from temporary infrastructure, working corridors and earthworks areas would be temporarily stored and then reinstated. This applies to locations both within and outwith the inundation area.

5.1 Excavation

Excavated peat should be excavated as turves, including the acrotelm (surface vegetation) and a layer of adjoining catotelm (more humified peat) typically up to 500mm thick in total, or as blocks of catotelm; the acrotelm should not be separated from its underlying peat;

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

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

5.2 Storage

The phasing of works for the Proposed Development will be undertaken at the detailed design stage and further details on temporary peat storage locations will be provided in the Stage 2 Detailed PMP. Further details on temporary peat storage and peat stability risks are provided in **Technical Appendix 12.1: Peat Landslide Hazard Risk Assessment.**

The design and phasing of works would also be undertaken to minimise peat and peat soil storage durations and would incorporate the following best practice to ensure protection of peat and peat soils.

The following general good practice applies to the storage of peat:

- stripped materials should be carefully separated to keep peat and other soils apart;

- to minimise handling and haulage distances, excavated material should be stored local to the site of excavation or end point of restoration;
- peat turves should be stored in wet conditions or irrigated in order to prevent desiccation (once dried, peat would not rewet);
- stockpiling of peat should be in large volumes to minimise exposure to wind and sun (and desiccation), but with due consideration for slope stability, but should not exceed 1 m in height to maintain stability of stockpile;
- stockpiles should be isolated from watercourses or drains with appropriate bunding to minimise pollution risks;
- excavated peat and topsoil stored separately, should be stored to a maximum of 1 m thickness;
- to be stored a minimum of 10 m from any watercourse.
- stores of non-turf (catotelm) peat should be bladed off to reduce the surface area and desiccation of the stored peat; and
- peat storage areas should be monitoring during periods of very wet weather, or during snowmelt, to identify early signs of peat instability.

5.3 Temporary Storage

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

- peat should be stored around the infrastructure perimeter at sufficient distance from the cut face to prevent overburden induced failure;
- local gullies, diffuse drainage lines (or very wet ground) and locally steep slopes should be avoided for peat storage; and
- drying of stored peat should be avoided by irrigation or by seeding (although this is unlikely to be significant for peat materials stored less than 2 months).

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

- where practicable, peat generated from excavations should be transported directly to its allocated restoration location, to minimise the volume being stockpiled with the possibility of drying out;
- stores of catotelmic peat should be bladed off to reduce their surface area and minimise desiccation;
- where transport cannot be undertaken immediately, stored peat should be irrigated to limit drying and stored on a geotextile mat to promote stability; and
- monitoring of large areas of peat storage during wet weather or snowmelt should be undertaken to identify any early signs of peat instability.

5.4 Transport

The following good practice applies to transport:

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

5.5 Handling

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

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

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

5.6 Restoration

During restoration, the following best practice should be followed:

- carefully evaluate potential restoration sites, such as borrow pits for their suitability, and agree that these sites are appropriate with the Environmental Clerk of Works (ECoW), landowners and relevant consultees;
- undertake restoration and revegetation or reseeding work as soon as possible;
- where required, consider exclusion of livestock from areas of the Proposed Development undergoing restoration, to minimise impacts on revegetation; and
- as far as reasonably practicable, restoration should be carried out concurrently with construction rather than at its conclusion.

5.7 Monitoring and Inspection

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

Should any problems be observed during regular visual inspections of peat stockpiles, this would invoke implementation of an appropriate corrective action which would be recorded and monitored for effectiveness. Types of corrective actions would include, but would not necessarily be limited to; modification of temporary drainage, additional or modified bunding,

incorporating of sediment fencing if required, light re-grading to correct any areas of surface erosion, etc.

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

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

5.8 Specific Mitigation

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

5.8.1 Access Tracks

There is much guidance[12,13] available to support access track design in upland areas including peatlands. Guidance is generally focused on floating tracks and excavated tracks and is summarised below.

Based on the avoidance of significant areas of deep peat during design iterations the access tracks are typically present on more localised areas of peat <1.0m. Based on the site gradients it is anticipated that all tracks would be excavated tracks which would require verge re-instatement and re-use and re-instatement of peat and peat soils to suitably integrate the road and tracks into adjacent habitats. The on-site footpaths would be floated in areas of peat.

Excavated tracks require complete excavation of any peat (where present) to a competent substrate. Excavated tracks would generally be undertaken where peat depths are less than 1m. The excavated peat would require storage ahead of re-use elsewhere within the Proposed Development. Good practice guidance relates mainly to drainage in association with excavated tracks:

- trackside ditches should capture surface water (within the acrotelm) before it reaches the road;
- interceptor drains should be shallow and flat bottomed (and preferably entirely within the acrotelm to limit drawdown of the water table);

12 Scottish Renewables, Scottish Natural Heritage, Scottish Environmental Protection Agency, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland, AEECoW (2019)., Good Practice During Wind Farm Construction. 4th Edition.

13 Scottish Natural Heritage, Forestry Commission (August 2010)., Floating Roads on Peat

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

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

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

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

5.8.2 Laybys

Approximately 90 laybys are included within the Proposed Development and final locations would be confirmed following detailed design. Laybys would be constructed in accordance with the guidance provided for access tracks with full re-instatement of these areas proposed with peat and peat soils depending on localised habitats to an average reinstatement depth of 1.0m post construction.

5.8.3 Compound Areas

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

Site Compound 1 (SC1) is located within a commercial plantation and would be restored to this use following completion of the construction phase. SC2 (powerhouse) and SC3 (inundation area borrow pit) are located within other areas of infrastructure and are included with these areas.

Localised areas of peat and peat soils are present within the footprint of this area and these would be excavated during the development of the compound area and used for restoration around the periphery of the compound to tie into adjacent habitats. Following the construction phase the compound area would be restored by re-use of peat soils up to a depth of up to 1m from other phases of construction to return the area to commercial woodland.

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

- peat stripped from compound areas would not be stored higher than 1 m and could require to be seeded in the short term to prevent drying out, if stored for long residence times;

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

5.8.4 Permanent Structures

Structures which require permanent excavations prior to construction include; the 2No. dams, powerhouse areas and control works with a number of smaller items of ancillary infrastructure. The primary mitigation measure for all permanent structures has been to locate the relevant infrastructure to avoid the areas of deepest peat, thereby reducing excavated volumes of peat where possible. All permanent excavations should follow the procedures detailed in Sections 5.1 to 5.7.

All Dams are located in close proximity to areas of peatland and localised re-use of peat and peat soils may be required to ensure integration into adjacent habitats, the following good practice guidance applies to re-use of peat for restoration of these areas:

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

The Powerhouse Landform Screening bund would comprise site won granular material and excess rock/spoil material to create a natural landform shape which will provide screening to the powerhouse and switchyard area when approaching from the east. Soils and peat soils would be used on and within the screening bund to facilitate restoration and integration into adjacent habitats.

Within the lower reservoir a vegetated rock armour shoreline is proposed with proposals to re-use available soil and peat soils for restoration and to support vegetation. The rock armour would be placed and with geotextile beneath to prevent soil migration. The soils would be placed and envisaged that this would be ‘topped-up’ as the soils settled over time until a rock armour / soil/turf matrix had formed. This would then be encouraged to naturally vegetate and may be supplemented with seeding and planting if required.

5.8.5 Borrow Pits

Peat and peat soils are proposed for re-use within the Poulary East, Glen Kingie Forest and Kingie Estate Borrow pits located outwith the inundation area for the purpose of restoration provided the method of re-use is consistent with the environmental reinstatement objectives of the Proposed Development and presents no residual risks from pollution of the environment or harm to human health.

Borrow pits would be re-instated with peat and/ or carbon rich soils up to a maximum of 1m to facilitate restoration and integration into adjacent habitats.

Key issues for borrow pit restoration are:

- prevention of desiccation and carbon losses from peat used in the restoration;
- development of complete vegetation cover through emplacement of peat turves or seeding with an appropriate species; and

- fencing where required, to exclude grazing stock and to encourage vegetation establishment.

5.8.6 Peatland Restoration Areas

Peatland restoration areas have been proposed within **Chapter 8, Appendix 8.7: OBEMP** outwith the Proposed Development Area and detailed within previous reporting[14]. The following good practice applies in relation to the use of excavated peat in peatland areas:

- All works to be undertaken in accordance with current best practice on Peatland Restoration[15];
- Disturbance to natural drainage systems / flow paths may increase potential for peat instability. Therefore, the restoration works should be undertaken to ensure no adverse loading is placed on areas of marginal peat stability with the restoration works ensuring that the natural topographic gradients and flows are re-instated to mitigate against potential increases in pore water pressure and increase in loadings;
- If any areas of peat instability are identified during the restoration works or monitoring phase then re-assessment of the area and proposed restoration works should be undertaken under the direction of an environmental advisor and geotechnical engineer (as necessary);
- Raise Health and Safety awareness of the peat environment at the proposed restoration areas by incorporating in the site induction. Include peat slide risk assessment information (e.g., peat instability indicators, best practice and emergency procedures) in toolbox talks with relevant operatives e.g., plant drivers; and
- Monitor areas of placed peat on regular basis to identify early any change in conditions.

14 ADL Nature.Fearna, Glen Quoich Estate. Drone Survey for Peat Infill Potential. 14th February 2025.

15 https://www.nature.scot/doc/peatland-action-technical-compendium

6.0 Peat Balance Assessment

The excavated materials data from Annex A indicates that the areas of infrastructure within the Proposed Development have avoided areas of deeper peat where possible through design. However, due to the large extents of the Dams and borrow pit within the inundation area these areas of infrastructure are determined by topography and hydrology, it is not possible to avoid all areas of deep peat>1m.

6.1 Excavated Volumes

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

- Interpolation of peat depth was undertaken using the spline interpolation method.
- An estimated acrotelm depth of 0.5m across all infrastructure where peat (>0.5m) is present based on peat depth survey results.
- An estimated catotelm thickness of the average depth of peat minus the acrotelm (0.5m) across all infrastructure where peat (>0.5m) is present based on peat depth survey results.
- An assumption that the peat probe depths are representative of the actual depth of peat (validated by the peat coring).

6.2 Reuse Volumes

The volume of peat to be reused around the Proposed Development is detailed in Table C and Annex A and based on the following assumptions:

- In appropriate locations around the perimeter of permanent structures a 1.5m wide strip at a thickness of about 0.5m.
- Re-instatement of construction tracks from 8m to 6m operation width using peat and / or peat soils.
- Re-instatement of access track verges at up to 2m either side of the track using peat and / or peat soils.
- Reinstatement of temporary compound area SC1 with an average peat soil depth of 1m to ensure integration with the adjacent habitat areas where possible which comprise blanket bog.
- Re-instatement of Borrow Pits with 1m of using peat and / or peat soils.
- Re-use of peat within Peatland restoration areas.

6.3 Net Peat Balance

Table C provides an estimate of peat volumes to be excavated and reused during the construction of the infrastructure identified in Table B.

Table C: Peat Balance Estimate

Infrastructure	Volume of Peat /Peat soils Excavated (m^3)	Volume of Peat/Peat soils Reused (m^3)
C1144 Public Road Widening	2978	6,762
PSH track- Construction Width 8m - Operation 6m	20,173	45,760
Southern Access to Kingie (Construction Width 8m, Operational Width 6m)	11,275	34,168
Large Passing Place	5,601	9,900
Small Passing Place	1,442	3,600
Proposed Bridge (North)	1,358	0
Proposed Bridge (South)	432	0
Dam Spillway North	1,543	0
Dam Spillway South	1,475	0
Dam Structure North	46,075	0
Dam Structure South	89,275	0
Dam Valve House North	782	113
Dam Valve House South	858	113
Powerhouse	0	16,500
Proposed Hardstanding Control Building	157	0
Site Compound 1	41,838	160,212
Borrow Pit (min operating level)	250,481	0
Poulary East BP	1,026	21,500
Glen Kingie BP	900	9,000
Kingie Estate BP	756	7,560
Peatland Restoration Areas	-	190,000
Total	478,427	505,187

The total volume of peat predicted to be excavated of 478,427m^3, does not exceed the intended total peat reuse volume of 505,187m^3, therefore no excess peat is required to be disposed off-site for the Proposed Development.

7.0 Waste Classification

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

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

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

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

Table D: Excavated Materials – Assessment of Suitability

Excavated Material	Indicative Volume on Site by % of total excavated soils	Is there a suitable use for material	Is the Material required for use on Site	Material Classified as Waste	Re-use Potential	Re-use on Site
Turf (Surface layer of vegetation and fibrous matt) and Acrotelmic Peat	85	Yes	Yes	Not classified as waste	Yes	Outwith the inundation area only. Would be re-used in reinstatement of access track verges, cut and fill verges, road verges, side slopes and check drains. Peripheral edges of infrastructure and restoration of borrow pits and temporary compounds. Peatland Restoration.
Catotelmic peat	15	Yes	Yes	Not classified as waste	Yes	Outwith the inundation area only. Would be re-used in reinstatement of access track verges, cut and fill verges, road verges, side slopes and check drains. Peripheral edges of infrastructure and restoration of borrow pits and temporary compounds. Peatland Restoration.
Amorphous Catotelmic Peat (amorphous material unable to stand unsupported when stockpiled >1m)	<5 Very limited as it has been avoided by design.	Potentially	Potentially *	Potentially if not required as justifiable restoration of peatland habitat management works	Limited	If peat does not require treatment prior to re-use it can be used on-site providing adequate justification and method statements are provided and approved by SEPA. If it is unsuitable for use without treatment then it may be regarded as a waste. However every attempt to avoid this type of peat has been incorporated into the design.

*Such uses for this type of material are limited, however there may be justification for use in the base of borrow pits to maintain waterlogged conditions and prevent desiccation of restored area and in some habitat management works such as gully or ditch blocking where saturated peat is required to mimic mire type habitats and encourage establishment of sphagnum.

8.0 Conclusion

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

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

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

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

Figures

Technical Appendix 12.2: Peat Management Plan

Fearna Pump Storage Scheme

Fearna Storage Limited

SLR Project No.: 428.013028.00001

28 February 2025

Annex A Excavated Materials Calculations

Technical Appendix 12.2: Peat Management Plan

Fearna Pump Storage Scheme

Fearna Storage Limited

SLR Project No.: 428.013028.00001

28 February 2025

Infrastructure on Peat	Length (m)	Width (m)	Area (m^2)	Average Depth of Peat soil (m)	Number	Total Excavated Volume Acrotelm Peat/Soils (m^3)	Total Excavated Volume Catotelm Peat (m^3)	Total Excavated Volume Peat Soils (m^3)	Length (m)	Restore Track (m)	Width (m)	Area (m^2)	Average Thickness of Peat Soils (m)	Number	Total Re-use Volume Acrotelm Peat/Soils (m^3)	Total Re-use Volume Catotelm Peat (m^3)	Total Re-use Volume of Peat (m^2)	Notes
C1144 Public Road Widening	2254	10	22544	0.13	1	2978	0	2978	2254	-	6	13524	0.50	1	6762	0	6762	
PSH track- Construction Width 8m - Operation 6m	5720	8	45760	0.44	1	20173	0	20173	5720	2	4	45760	1.00	1	22880	22880	45760	Assumes restoration of track to 6m with 2m wide strip either side to tie into peatland habitats
Southern Access to Kingie (Construction Width 8m, Operational Width 6	4271	8	34168	0.33	1	11275	0	11275	4271	2	4	34168	1.00	1	17084	17084	34168	Assumes restoration of track to 6m with 2m wide strip either side to tie into peatland habitats
Large Passing Place	55	3.6	198	0.57	50	4950	651	5601	55	-	3.6	198	1.00	50	4950	4950	9900	
Small Passing Place	40	3.6	144	0.25	40	1442	0	1442	40	-	3.6	144	0.50	50	3600	0	3600	
Proposed Bridge (North)	-	-	6702	0.20	1	1358	0	1358	-	-	-	-	-	-	0	0	0	
Proposed Bridge (South)	-	-	3464	0.12	1	432	0	432	-	-	-	-	-	-	0	0	0	
Dam Spillway North	-	-	6463	0.24	1	1543	0	1543	-	-	-	-	-	-	0	0	0	
Dam Spillway South	-	-	4476	0.33	1	1475	0	1475	-	-	-	-	-	-	0	0	0	
Dam Structure North	-	-	128976	0.36	1	46075	0	46075	-	-	-	-	-	-	0	0	0	
Dam Structure South	-	-	134855	0.66	1	67428	21848	89275	-	-	-	-	-	-	0	0	0	
Dam Valve House North	-	-	2500	0.31	1	782	0	782	150	-	1.5	225	0.50	1	113	0	113	Assumes 0.5m deep tie into adjacent peatland habitat around the periphery.
Dam Valve House South	-	-	2500	0.34	1	858	0	858	150	-	1.5	225	0.50	1	113	0	113	Assumes 0.5m deep tie into adjacent peatland habitat around the periphery.
Powerhouse	-	-	191742	0.00	1	0	0	0	1100	-	15	16500	1.00	1	8250	8250	16500	Shoreline soil re-instatement.
Proposed Hardstanding Control Building	-	-	400	0.39	1	157	0	157	-	-	-	-	-	-	0	0	0	
Site Compound 1	-	-	160212	0.26	1	41838	0	41838	-	-	-	160212	1.00	1	80106	80106	160212	Assumes 1m restoration using soils for long term restoration.
Borrow Pit (min operating level)	-	-	399739	0.63	1	199870	50611	250481	-	-	-	-	-	-	0	0	0	
Poulary East BP	-	-	17409	0.06	1	1026	0	1026	215	-	100	21500	1.00	1	10750	10750	21500	Area from Figure 2.27
Glen Kingie BP	100	90	9000	0.10	1	900	0	900	100	-	90	9000	1.00	1	4500	4500	9000	Area from Figure 2.28
Kingie Estate BP	105	72	7560	0.10	1	756	0	756	105	-	72	7560	1.00	1	3780	3780	7560	Area from Figure 2.29
Peatland Restoration - Peat infill to degraded areas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	190000	0	190000	ADL Peat Restoration Areas
Totals						**405317**	**73110**	**478427**							**352887**	**152300**	**505187**	

Total Excavated Volume Acrotelm Peat (m^3)	**405317**
Total Excavated Volume Catotelm Peat (m^3)	**73110**
Total Excavated Volume Peat (m^3)	**478427**
Total Re-use Volume Acrotelm Peat (m^3)	**352887**
Total Re-use Volume Catotelm Peat (m^3)	**152300**
Total Re-use Volume of Peat (m^3)*	**505187**
Net Balance (m^3)	**-26760**

Excluded (overlaps with other infrastructure)

Allt Ladaidh Road and Bridge Realignment
Powerhouse Access Track
Public Path Diversion - No excavation
Site Compound 2 - Located within Powerhouse
Site Compound 3 - Located within Borrow pit (min operating level)
Switchyard Located within Powerhouse
Temporary Construction Access Located within Borrow pit (min operating level) / DAM
Upper Inlet/Outlet Located within Borrow pit (min operating level)

Annex B Peat Core Data

Technical Appendix 12.2: Peat Management Plan

Fearna Pump Storage Scheme

Fearna Storage Limited

SLR Project No.: 428.013028.00001

28 February 2025

Peat Core Log

Hole No. **PC01**

Sheet 1 of 1

Project: Fearna Pump Storage Scheme	Client: Fearna Storage Ltd.		Dates: 20-07-2023
Project No: 428.013084.00001	Logger: ET	Approved By: AH	Coordinates: E: 205120.00 N: 803846.00
Location: Invergarry, Highlands	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 1.00			Recovery = 100%	0.80			Dark brown fibrous PEAT (H2, B2)
	1.00 - 2.00				1.40			Dark brown pseudo-fibrous PEAT (H3, B2)
				Recovery = 100%	1.80			Dark brown pseudo-fibrous PEAT (H6, B2)
								Peat Core Complete at 1.80m

Remarks:

1. Peat core obtained using peat sampler.

Peat Core Log

Hole No. **PC02**

Sheet 1 of 1

Project: Fearna Pump Storage Scheme	Client: Fearna Storage Ltd.		Dates: 20-07-2023
Project No: 428.013084.00001	Logger: ET	Approved By: AH	Coordinates: E: 205148.00 N: 803958.00
Location: Invergarry, Highlands	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 1.00			Recovery = 90%	0.80			Dark brown fibrous PEAT (H2, B2)
	1.00 - 2.00				2.00			Dark brown pseudo-fibrous PEAT (H3, B2)
	2.00 - 2.70			Recovery = 100%	2.70			Dark brown pseudo-fibrous PEAT (H4, B2)
				Recovery = 100%				Peat Core Complete at 2.70m

Remarks:

1. Peat core obtained using peat sampler.

Peat Core Log

Hole No. **PC03**

Sheet 1 of 1

Project: Fearna Pump Storage Scheme	Client: Fearna Storage Ltd.		Dates: 20-07-2023
Project No: 428.013084.00001	Logger: ET	Approved By: AH	Coordinates: E: 205439.00 N: 803773.00
Location: Invergarry, Highlands	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 1.00			Recovery = 90%	0.50			Dark brown pseudo-fibrous PEAT (H2, B2)
	1.00 - 2.00				2.00			Dark brown pseudo-fibrous PEAT (H3, B2)
	2.00 - 2.70			Recovery = 85%	2.70			Dark brown pseudo-fibrous PEAT (H4, B2)
				Recovery = 100%				Peat Core Complete at 2.70m

Remarks:

1. Peat core obtained using peat sampler.

Peat Core Log

Hole No. **PC04**

Sheet 1 of 1

Project: Fearna Pump Storage Scheme	Client: Fearna Storage Ltd.		Dates: 20-07-2023
Project No: 428.013084.00001	Logger: ET	Approved By: AH	Coordinates: E: 205505.00 N: 803480.00
Location: Invergarry, Highlands	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 1.00			Recovery = 100%	0.50			Dark brown pseudo-fibrous PEAT (H2, B2)
					1.00			Dark brown pseudo-fibrous PEAT (H3, B2)
	1.00 - 1.70				1.70			Dark brown pseudo-fibrous PEAT (H4, B2)
				Recovery = 100%				Peat Core Complete at 1.70m

Remarks:

1. Peat core obtained using peat sampler.

Peat Core Log

Hole No. **PC05**

Sheet 1 of 1

Project: Fearna Pump Storage Scheme	Client: Fearna Storage Ltd.		Dates: 20-07-2023
Project No: 428.013084.00001	Logger: ET	Approved By: AH	Coordinates: E: 205862.00 N: 802859.00
Location: Invergarry, Highlands	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 1.00			Recovery = 90%	0.30			Brown fibrous PEAT (H2, B2)
					1.00			Dark brown pseudo-fibrous PEAT (H3, B2)
	1.00 - 2.00			Recovery = 90%	2.40			Dark brown pseudo-fibrous PEAT (H4, B3)
	2.00 - 2.40			Recovery = 100%				Peat Core Complete at 2.40m

Remarks:

1. Peat core obtained using peat sampler.

Peat Core Log

Hole No. **PC06**

Sheet 1 of 1

Project: Fearna Pump Storage Scheme	Client: Fearna Storage Ltd.		Dates: 20-07-2023
Project No: 428.013084.00001	Logger: ET	Approved By: AH	Coordinates: E: 205576.00 N: 802805.00
Location: Invergarry, Highlands	Hole Type: HA	Level:	Vertical Scale: 1:26

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
	0.00 - 1.00			Recovery = 100%	0.50			Dark brown fibrous PEAT (H2, B2)
	1.00 - 2.00				1.50			Dark brown pseudo-fibrous PEAT (H3, B2)
	2.00 - 2.20			Recovery = 90%	2.20			Dark brown pseudo-fibrous PEAT (H4, B2)
				Recovery = 100%				Peat Core Complete at 2.20m

Remarks:

1. Peat core obtained using peat sampler.

Peat Core 01
0 – 1.0m

Peat Core 01
1.0 – 1.8m

SLR Consulting
Regus, Suite 223ab
4 Redheughs Rigg
South Gyle
Edinburgh
EH12 9DQ

Tel: 0131 335 6830
Web: www.slrconsulting.com

FEARNA PUMP STORAGE SCHEME

Fearna Storage Limited

Project No.: 428.013125.00001

Photograph Date: July 2023

Peat Core 02
0 – 1.0m

Peat Core 02
1.0 – 2.0m

SLR Consulting
Regus, Suite 223ab
4 Redheughs Rigg
South Gyle
Edinburgh
EH12 9DQ

Tel: 0131 335 6830
Web: www.slrconsulting.com

FEARNA PUMP STORAGE SCHEME

Fearna Storage Limited

Project No.: 428.013125.00001

Photograph Date: July 2023

Peat Core 02
2.0– 2.7m

Peat Core 03
0 – 1.0m

SLR Consulting
Regus, Suite 223ab
4 Redheughs Rigg
South Gyle
Edinburgh
EH12 9DQ

Tel: 0131 335 6830
Web: www.slrconsulting.com

FEARNA PUMP STORAGE SCHEME

Fearna Storage Limited

Project No.: 428.013125.00001

Photograph Date: July 2023

Peat Core 03
1.0– 2.0m

Peat Core 03
2.0 – 2.7m

SLR Consulting
Regus, Suite 223ab
4 Redheughs Rigg
South Gyle
Edinburgh
EH12 9DQ

Tel: 0131 335 6830
Web: www.slrconsulting.com

FEARNA PUMP STORAGE SCHEME

Fearna Storage Limited

Project No.: 428.013125.00001

Photograph Date: July 2023

Peat Core 04
0 – 1.0m

Peat Core 04
1.0 – 1.7m

SLR Consulting
Regus, Suite 223ab
4 Redheughs Rigg
South Gyle
Edinburgh
EH12 9DQ

Tel: 0131 335 6830
Web: www.slrconsulting.com

FEARNA PUMP STORAGE SCHEME

Fearna Storage Limited

Project No.: 428.013125.00001

Photograph Date: July 2023

Peat Core 05
0 – 1.0m

Peat Core 05
1.0 – 2.0m

SLR Consulting
Regus, Suite 223ab
4 Redheughs Rigg
South Gyle
Edinburgh
EH12 9DQ

Tel: 0131 335 6830
Web: www.slrconsulting.com

FEARNA PUMP STORAGE SCHEME

Fearna Storage Limited

Project No.: 428.013125.00001

Photograph Date: July 2023

Peat Core 05
2.0 – 2.2m

Peat Core 06
0 – 1.0m

SLR Consulting
Regus, Suite 223ab
4 Redheughs Rigg
South Gyle
Edinburgh
EH12 9DQ

Tel: 0131 335 6830
Web: www.slrconsulting.com

FEARNA PUMP STORAGE SCHEME

Fearna Storage Limited

Project No.: 428.013125.00001

Photograph Date: July 2023

Peat Core 06
1.0 – 2.0m

Peat Core 06
2.0 – 2.2m

SLR Consulting
Regus, Suite 223ab
4 Redheughs Rigg
South Gyle
Edinburgh
EH12 9DQ

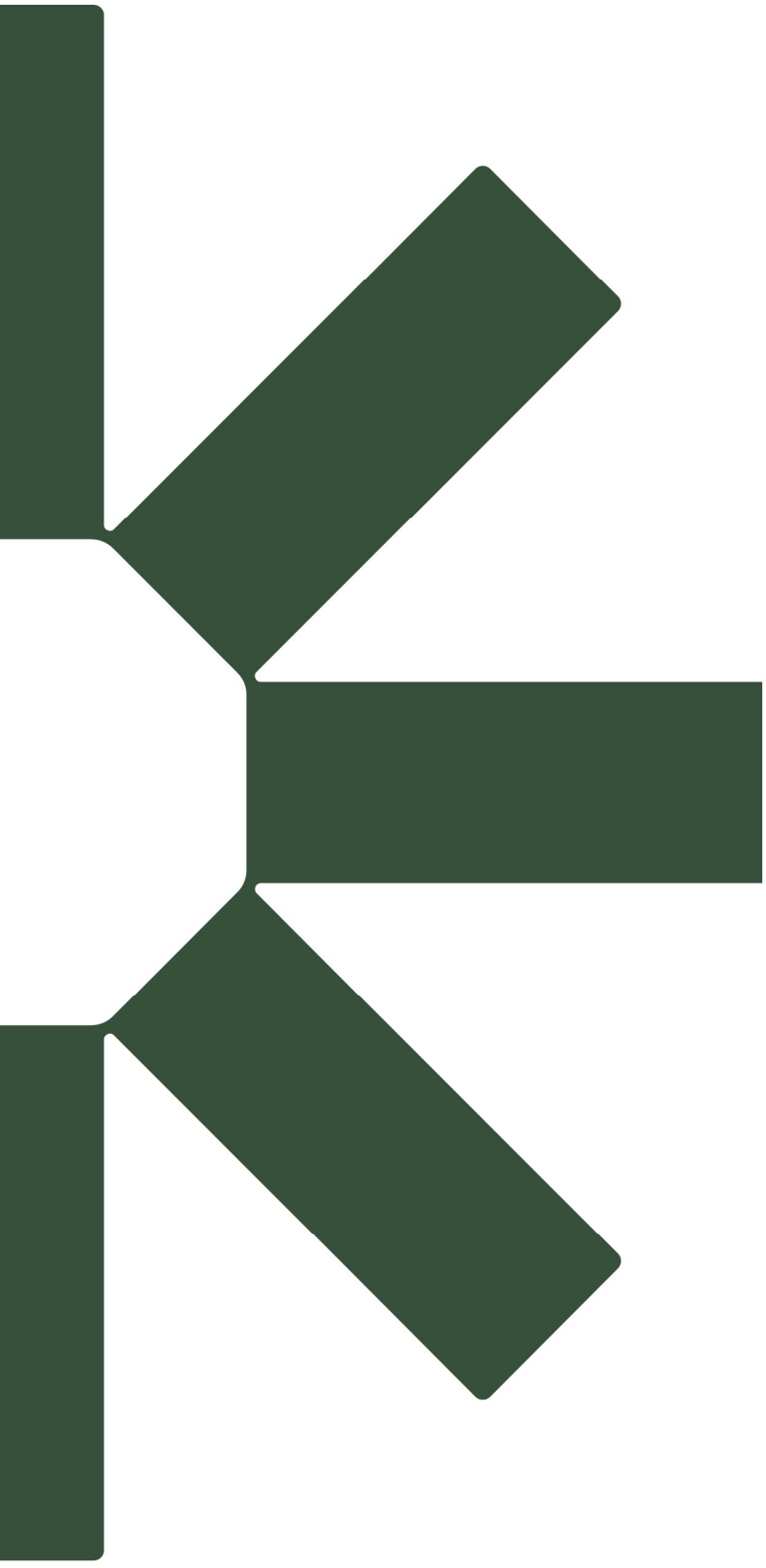
Tel: 0131 335 6830
Web: www.slrconsulting.com

FEARNA PUMP STORAGE SCHEME

Fearna Storage Limited

Project No.: 428.013125.00001

Photograph Date: July 2023



Making Sustainability Happen