*Loch Kemp Storage - EIA Report*

*Appendix 14.1: Peat Management Plan*

*November 2023*

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# Technical Appendix 14.1: Peat Management Plan

## Loch Kemp Pump Storage Scheme

### Loch Kemp Storage

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# Basis of Report

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# 1.0 Introduction

## 1.1 General

SLR Consulting Ltd (SLR) was commissioned by Loch Kemp Storage Limited (the Applicant) to undertake a Stage 1 Outline Peat Management Plan (PMP) at the proposed Loch Kemp Pump Storage Scheme (hereafter referred to as the "Proposed Development"). The area of the Proposed Development is shown in **Figure 14.1.1** within the site boundary (hereafter referred to as "The Site"). The Proposed Development is located within Dell Estate, approximately 13 km to the northeast Fort Augustus, Highlands, Scotland.

It is anticipated that the Proposed Development would comprise a new pumped storage scheme up to 600 MW with the existing Loch Kemp as the upper storage reservoir and Loch Ness as the lower reservoir. In order to allow drawdown for storage, Loch Kemp would be raised by approximately 28 m from its existing 177 m AOD elevation to approximately 205 m AOD. Four new saddle dams and four minor cut-off dams between 16 – 34 m high would be constructed as well as an upper intake system in Loch Kemp to collect water from the upper reservoir. A new shaft type powerhouse would be constructed on the shore of Loch Ness, with integral tailrace arrangement with fish screens connecting the system to Loch Ness. The scheme would utilise an underground tunnelled waterway system to link between the intake on Loch Kemp and the powerhouse at Loch Ness, with the potential inclusion of two surge shafts (with associated access) on the hilltop between Loch Kemp and Loch Ness.

Associated Works to the Proposed Development would include a 275 kilovolt (kV) switching station and underground cable (UGC) which would form part of a separate application, however to ensure an integrated approach to the management of peat and peaty soils within the development, and given the UGC and switching station platform would be constructed by the Applicant, this infrastructure has been included within this PMP. See Section 3.7 of **Volume 1, Chapter 3: Description of Development** of the EIA Report for further information.

The PMP provides details on the approximate predicted volumes of peaty soils and peat that would be excavated during construction, the characteristics of the peat that would be excavated, and the principles of how and where this excavated peat would be stored, reused and managed.

Soils which are temporarily removed and stored within the 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. Soils from within the footprint of the permanent construction works are considered in this PMP. The principles presented in Section 4.0, regarding the safeguarding of soils, their storage and placement, apply equally to both soils from the working corridors and those removed from the footprint of permanent infrastructure.

## 1.2 Site Description

The Proposed Development is a combination of sloping natural woodland on the lower slopes of Loch Ness, commercial forestry on higher elevations and areas of moorland. The location and layout of the Proposed Development are detailed on **Figure 14.1.1** and **Figure 14.1.2** respectively.

Information and historic maps from the National Library of Scotland indicate that the Proposed Development has experienced limited changes over time. Using the OS One Inch 1885-1900 map, the Proposed Development Area previously generally consisted of open, undulating, undeveloped land. Dell Estate and Dell Farm were present during this period. On

review of the OS One Inch 1955-1961, there are minor developments near the Proposed Development in Whitebridge, such as housing and a hotel.

Full details of the Proposed Development are provided in **Volume 1, Chapter 3: Description of Development** of the EIA Report.

## 1.3 Objectives

The Stage 1 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 (Stage 2 PMP) and construction(Stage 3 PMP) of the development.

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 that would minimise any impacts and the long-term habitat restoration and management plans.

The PMP seeks to identify that appropriate proposals to re-use the surplus peat can be accommodated within the Proposed Development and associated Habitat Management Plan (HMP) proposals (an outline HMP is provided in **Volume 4, Appendix 10.7**), without significant environmental or health and safety implications, to minimise risk in terms of carbon release and human health.

## 1.4 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 Windfarm Construction, 4th Edition (Scottish Renewables, Scottish Natural Heritage (now NatureScot), Scottish Environment Protection Agency, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland Science and AEECoW, 2019);
- 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).

### 1.4.1 Requirements of National Planning Policy 4

The intent of Policy 5 (Soils) of National Planning Policy 4 (NPF4)[1] 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:

- 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 **Volume 4, Appendix 10.7: Outline Habitat Management Plan**.

### 1.4.2 Mitigation Hierarchy

SEPA[2,3] has published guidance regarding the mitigation hierarchy for developments on peat which is summarised below:

1 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

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

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

- 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.

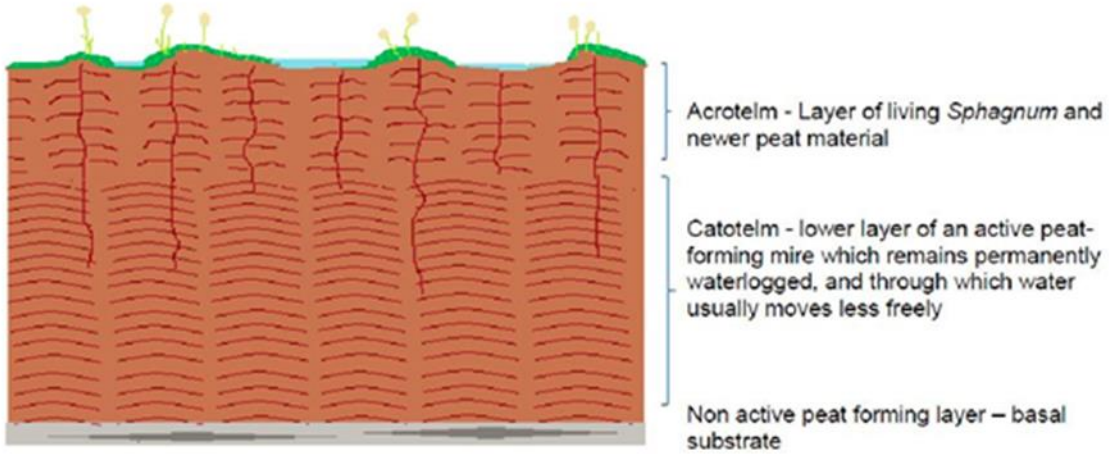
Details of the design iterations to avoid areas of peat in accordance with the mitigation hierarchy are provided in **Chapter 2: Design Evolution and Alternatives**.

### 1.4.3 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, and is of depths > 0.5m.

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. 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 is amorphous and has very low tensile strength making it less suitable for storage and re-use.

# 2.0 Site Work

## 2.1 Peat Depth Survey

Peat depth surveys have been undertaken across a number of phases by SLR:

- Peat depth surveys undertaken in December 2021, February 2022, May 2022, July 2022, September 2022, November 2022, January 2023, May 2023, June 2023 and July 2023.
- The surveys carried out followed best practice guidance for developments on peatland[4,5]. Phase 1 peat probing resulted in probing on a 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 Site which was used in preliminary site layout designs. Multiple phases of higher density probing saw detailed probing undertaken across the Proposed Development, focussing on access tracks at 50m intervals and infrastructure typically at a density of 10m x 10m with some extensive infrastructure areas (Dams, Welfare Compound) on 20 x 20m density. Phase 1 probing was typically not undertaken on a 100m grid in areas of exposed bedrock and steep slopes outwith areas of proposed infrastructure as shown on **Figure 14.1.3**. The density of peat probing undertaken is considered appropriate to confirm the extents of peatland within the area of the Proposed Development.

Peat is generally defined as an organic soil in excess of 0.5m, if the soil is less than 0.5m, then it is considered peaty soil. Thin peat was classed as being 0.5m to 1.0m thick, with deposits in excess of this being classed as deep peat.

Where surveys were undertaken by SLR, 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.

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.

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

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

## 2.2 Peat Depth Results

The results from all probing exercises listed above in Section 4.1 are detailed in the following sections and the peat depths identified on-site are shown in **Figure 14.1.3**. Interpolation of peat depth was undertaken using Inverse Distance Weighting (IDW).

The peat was found to vary across the Site in terms of thickness and coverage. It is evident from review of the relevant figures and data that the peat is generally limited to flatter lying topographic areas. There were localised areas of peat (Blanket Bog), defined by topography and undulating bedrock. Deeper peat was generally encountered in flatter, lower gradient areas of the Site.

A total of 5,969 peat probes were undertaken across all survey phases, with the results summarised in Table A below.

**Table A: Peat Probing Results**

| Peat Thickness (m) | **No. of Probes** | **Percentage (of total probes undertaken on-site)** |
|---|---|---|
| 0 (no peat) | 996 | 16.7 |
| 0.01 – 0.49 (peaty soil) | 4202 | 70.4 |
| 0.50 – 0.99 | 303 | 5.1 |
| 1.00 – 1.49 | 91 | 1.5 |
| 1.50 – 1.99 | 89 | 1.5 |
| 2.00 – 2.49 | 56 | 0.9 |
| 2.50 – 2.99 | 86 | 1.4 |
| 3.00 – 3.49 | 30 | 0.5 |
| 3.50 – 3.99 | 40 | 0.7 |
| > 4.0 | 76 | 1.3 |

## 2.3 Peat Condition

Peat is described using BS5930[6] and the von Post classification[7]. Peat samples were collected by SLR in January and May 2023, using a peat auger and used to inform interpretations of the peat condition and underlying substrate.

Based on interpretations from probing and peat core samples, the peat within the Proposed Development is predominantly pseudo-fibrous in nature. Based on field descriptions at augering points, most of the peat would be classified as between H4 and H5 in the von Post classification, showing very weak to moderate decomposition. Peat Core logs and photographs are presented within Annex B with the details on Peat Condition provided in **Figure 14.1.4.**

6 BS 5930:2015+A1:2020, Code of practice for ground investigations

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

## 2.4 Substrate

Where possible, in the SLR investigation, an assessment of the substrate was made, as described previously. From the evidence of the probing and sampling where available, the substrate falls into one of two principal categories:

- Granular (sand and/or gravel/weathered rock), of glacial origin and occasionally interbedded with silty sands;
- Rock, no rock samples were recovered from the probe locations although where exposed, the rock is seen to be metamorphic rocks; and
- Limited cohesive horizons were interpreted by the probing and encountered at the base of peat coring. However, it is likely that any cohesive material is weathered silty material at the top of the weathered glacial material.

# 3.0 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, welfare compound, temporary construction compounds and laydown areas, 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.

# 4.0 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 largely avoided 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 **Volume 1, Chapter 2: Design Evolution and Alternatives**. Where peat and peaty soils are to be excavated, re-used or reinstated, the following good practice applies.

Where peat is to be re-used or reinstated with the intention that its supported habitat continues to be viable, the following good practice outlined in the sections below applies. It is proposed that these principals will be developed as part of a Stage 2 PMP assessment in agreement with SEPA following detailed site design.

Any peaty soils excavated within the SAC would be re-used within the SAC only. No peat or peaty soils excavated from areas out with the SAC would be imported for re-use within the SAC.

Excavated peat and peaty soils from within the inundation area would be re-used out with the inundation area.

## 4.1 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.

## 4.2 Storage

The following good practice applies to the storage of peaty soils/peat:

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

## 4.3 Temporary Storage

Any peaty soils/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:

- 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.

## 4.4 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 soils with other materials.

## 4.5 Handling

Following refinement of the excavated peat and peaty soils 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 peaty soils, peat volumes split into area/volume of 'acrotelm' or 'turf', and volume of catotelm) which would be achieved by undertaking additional probing in line with current guidance following removal of trees post-consent;
- volume to be stored locally and volume to be transferred directly on excavation to restoration areas elsewhere (e.g. disused quarries, borrow pits or peatland habitat restoration areas) in order to minimise handling;
- location and size of storage area relative to infrastructure foundations/areas and natural peat morphology / drainage features; and
- irrigation requirements and methods to minimise desiccation of excavated peat during short term storage.

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

## 4.6 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.

## 4.7 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.

## 4.8 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.

### 4.8.1 Access Tracks

There is much guidance[8,9] available to support access track design in 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 with tracks all typically present on peat <1.0m and only limited sections of track on very localised areas of peat >1.0m then it is anticipated that most, if not all tracks, would be excavated tracks.

Excavated tracks require complete excavation of soil/peat to a competent substrate. Excavated tracks would generally be undertaken where peat depths are less than 1m. This peat/soil would require storage ahead of re-use elsewhere within 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);
- any stripped peat turves should be placed back in the invert and sides of the ditch to assist regeneration and prevent erosion to the peat and wash out that could occur; and
- culverts and cross drains should be installed under excavated tracks to maintain subsurface drainage pathways (such as natural soil pipes or flushes). Discharge from constructed drainage should allow for as much diffuse dispersion of clean (silt free) water as possible while minimising disturbance to existing peatland as far as possible. Silt mitigation measures would be incorporated into all constructed drainage as per the requirements of the CEMP.

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

8 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.

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

- 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.

### 4.8.2 Compounds / Laydown Areas

Any other temporary hardstanding areas would be re-graded with peat or soil to a natural profile and reinstated as appropriate. Therefore, the following good practice guidance applies:

- peat stripped from compounds and laydown 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.

### 4.8.3 Permanent Structures

Structures which require permanent excavations prior to construction include; the 8No. dams, powerhouse platform and inlet/outlet structure. 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. All permanent excavations should follow the procedures detailed in Sections 4.1 to 4.7.

### 4.8.4 Cable Trenches

Cable trenches either require peat excavation specifically for this purpose, or they can be constructed within landscaping of shoulders adjacent to tracks. Good practice guidance is as follows:

- utilise peat shoulders for cable lays where possible to minimise peat excavations specifically for this purpose, in this case, peat shoulders should be 1.0m to 1.5m thick;
- where cable trenching is constructed adjacent to a road, ensure the trench is backfilled to prevent void filling by material migration;
- minimise time between excavation of the cable trench and peat reinstatement, preferably avoiding excavation until the electrical contractor has cables on-site ready for installation; and
- avoid incorporating substrate materials in the excavation, to minimise contamination of the peat to be reinstated. Replace excavated materials sequentially.

### 4.8.5 Borrow Pits

Peat may be re-used within borrow pits for the purpose of their 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. 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.

# 5.0 Estimation of Peat Volumes

Table B provides an estimate of peat and peaty soil volumes to be excavated and re-used during the construction of the permanent structures Proposed Development. The peat and peaty soil excavation and re-use volumes are detailed for each infrastructure element in Annex A.

The excavated materials data from Annex A indicates that the areas of infrastructure within the Proposed Development are typically located in areas of peaty soils with very limited infrastructure present in areas of peat >0.5m. The table also demonstrates the following:

- the avoidance of areas of peat where possible through design;
- re-use of the excavated materials is minimised where possible;
- and any excavation and re-use is undertaken in line with updated industry good practices and guidance; and
- limitations and consideration for future work.

**Table B: Peat Excavation Balance Assessment**

| Method | Volume of Excavated Peat/Peaty Soils ($m^3$) | Opportunity for Avoidance or Minimisation of Excavated Material | Re-use Requirements | Mitigation Hierarchy Adherence | Limitations and Considerations |
|---|---|---|---|---|---|
| Permanent and Upgraded Access Track (Excavated)<br>Total length of the excavated tracks would be approximately 15 km with an average peaty soils depth of 0.13 m. | 11,421$m^3$ | Tracks have been subject to several design iterations, to avoid deep peat where possible. | Verge restoration and visual screening, particularly along access track. Sections of the route may require cut and fill and these slopes would require restoration to minimise visual impact.<br>37,894 $m^3$ of excavated peat and peaty soil would be used along access tracks. | Avoidance was first level of screening to avoid areas of deeper peat. Routing has been planned on thinner peat or peaty soils where possible.<br>The layout design has been guided by constraints which highlight ecological, hydrogeological and geomorphological - all of which identify the peat areas to avoid. | Requires detailed ground investigation to fully characterise ground conditions. |
| Temporary Access Track (Excavated)<br>Total length of the excavated tracks would be approximately 6.5 km with an average peaty soils depth of 0.11 m. | 4,099 $m^3$ | Tracks have been subject to several design iterations, to avoid deep peat where possible. | Temporary tracks to be reinstated out with the inundation area on completion.<br>3,492 $m^3$ of excavated peat and peaty soil would be used along access tracks. | Re-use and backfill excavated materials. | Requires detailed ground investigation to fully characterise ground conditions. |

| Method | Volume of Excavated Peat/Peaty Soils ($m^3$) | Opportunity for Avoidance or Minimisation of Excavated Material | Re-use Requirements | Mitigation Hierarchy Adherence | Limitations and Considerations |
|---|---|---|---|---|---|
| Cable Trenches[10]<br>Total distance approximately 3.5 km with an average peaty soils depth of 0.14 m. | 1,624 $m^3$ | Minimised disturbance to drainage by taking cable route along existing access track and adjacent to new roads. Much of the cable routes are over shallow peaty soils and glacial till where complete re-use of the materials on site is envisaged. | Would be able to re-use excavated materials to backfill cable route trenches. | Re-use and backfill excavated materials. | Requires detailed ground investigation to fully characterise ground conditions. |
| Powerhouse Building, Platform, Quayside and Pier are situated on glacial soils. | 0 $m^3$ | Located on glacial soils. | N/A | N/A | N/A |

[10] Associated Works to the Proposed Development, subject to a separate consenting process.

| Method | Volume of Excavated Peat/Peaty Soils ($m^3$) | Opportunity for Avoidance or Minimisation of Excavated Material | Re-use Requirements | Mitigation Hierarchy Adherence | Limitations and Considerations |
|---|---|---|---|---|---|
| Switching station compound[11] with an approximate area of 9,600 $m^2$ with an average peaty soils depth of 0.27 m. | 2,592 $m^3$ | The proposed substation compound would largely be located on peaty/glacial soils adjacent to the proposed access tracks. | Materials would be re-used in other areas of the site such as Borrow Pit restoration or verge restoration outwith the inundation area. | Avoided siting substation on deep peat areas where possible. | Requires detailed ground investigation to fully characterise ground conditions. |
| Temporary Laydown Areas<br>Two areas with an approximate area of 15,765 $m^2$ with an average peaty soils depth of 0.11 m. | 1,730 $m^3$ | The laydown areas would largely be located on peaty/glacial soils adjacent to the proposed access tracks. | Materials would be re-used on site to reinstate the laydown areas. | Avoided siting on deep peat areas where possible. | Requires detailed ground investigation to fully characterise ground conditions. |
| Main Welfare Compound with an approximate area of 51,410 $m^2$ with an average peaty soils depth of 0.32 m. | 16,451 $m^3$ | The proposed compound would largely be located on peaty/glacial soils adjacent to the proposed access tracks. | Materials would be re-used on site to reinstate the Main Welfare Compound. | Avoided siting compound on deep peat areas where possible. | Requires detailed ground investigation to fully characterise ground conditions. |

[11] Associated Works to the Proposed Development, subject to a separate consenting process.

| Method | Volume of Excavated Peat/Peaty Soils ($m^3$) | Opportunity for Avoidance or Minimisation of Excavated Material | Re-use Requirements | Mitigation Hierarchy Adherence | Limitations and Considerations |
|---|---|---|---|---|---|
| Inlet/Outlet Structure with an approximate area of 7,844 $m^2$ with an average peaty soils depth of 0.13 m. | 1,020 $m^3$ | The proposed structure would largely be located on peaty/glacial soils adjacent to the proposed access tracks. | Materials would be re-used in other areas of the site such as Borrow Pit restoration or verge restoration outwith the inundation area. | Avoided siting structure on deep peat areas where possible. | Requires detailed ground investigation to fully characterise ground conditions. |
| 8 No. Dams with an approximate area of 78,320 $m^2$ with an average peaty soils depth of 0.22 m. | 41,615 $m^3$ | Dams have been subject to several design iterations, to avoid thick peat where possible. | Materials would be re-used in other areas of the site such as Borrow Pit restoration or verge restoration outwith the inundation area. | Avoided siting dams on deep peat areas where possible. | Requires detailed ground investigation to fully characterise ground conditions. |
| Borrow Pits<br>There are 7 No. borrow pit options, generally with limited peat cover. | 4,701 $m^3$ | There is limited peaty soils/peat overlying the selected borrow pits. | No re-use/ restoration of borrow pits within the inundation area. Limited peaty topsoil can be stockpiled and used for restoration.<br>Peat/peaty soils from elsewhere on-site could be used to restore the proposed borrow pits: 31,222 $m^3$ | Site selection avoided areas of peat for borrow pits, identified sites on bedrock or close to minimise removal of excessive materials. | Current calculations are based on conservative re-use and based on the use of three borrow pits located outwith the inundation area.<br>Detailed ground investigation is required to assess the ground conditions at each site. |

| Method | Volume of Excavated Peat/Peaty Soils ($m^3$) | Opportunity for Avoidance or Minimisation of Excavated Material | Re-use Requirements | Mitigation Hierarchy Adherence | Limitations and Considerations |
|---|---|---|---|---|---|
| Total Excavated | 85,253 $m^3$ | Total Re-use | 86,904 $m^3$ | | |

# 6.0 Peat 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 C 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 C, it has been concluded that all of the materials to be excavated on-site would fall within the non-waste classification as the peaty soils and peat would be re-used on-site. Based on a detailed probing exercise and visual inspection of the peat, it is predominantly fibrous peat which would be suitable to be re-used on-site.

Typically, the peat was 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 C: 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 |
|---|---|---|---|---|---|---|
| Mineral Soil | 25 | 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 embankments of infrastructure and restoration of borrow pits. Peatland Restoration. |
| Turf (Surface layer of vegetation and fibrous matt) | 35 | Yes | Yes | Not classified as waste | Yes | |
| Acrotelmic peat | 35 | Yes | Yes | Not classified as waste | Yes | Would be re-used in reinstatement of access track verges, cut and fill verges, road verges, side slopes and check drains. Peripheral embankments of infrastructure and restoration of borrow pits. Peatland Restoration. |
| Catotelmic Peat (amorphous material unable to stand unsupported when stockpiled >1m) | 5<br>Very limited as it has been avoided by design. | Potentially | Potentially * | Potentially if not required as justifiable restoration of 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.<br>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.



# 7.0 Conclusion

This Stage 1 PMP presents a pre-construction assessment of the expected peat extraction 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 method, 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 several 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, and maintenance and updating of this plan 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 14.1: Peat Management Plan

### Loch Kemp Pump Storage Scheme

### Loch Kemp Storage

SLR Project No.: 428.04707.00032

13 November 2023

## Key

Site Boundary

N

Scale 1:50,000 @ A3

0 Km 2

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**Loch Kemp Storage**
**EIA Report**

**Figure 14.1.1**
**Site Location**

**Drawn by:** SLR **Date:** 14/11/2023

**Drawing:** 04707.00032.0034.0

Loch Kemp Storage
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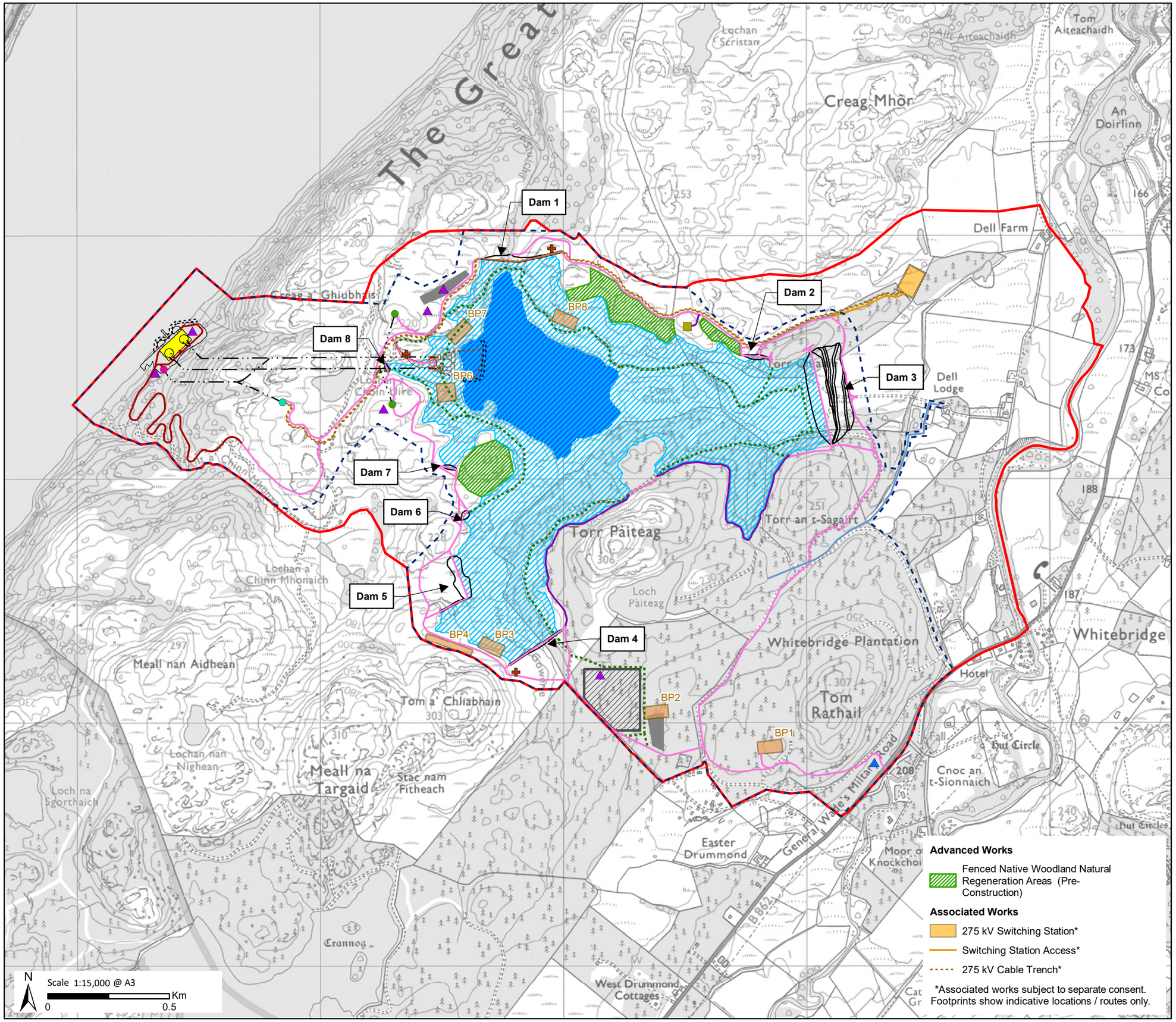


**Advanced Works**

Fenced Native Woodland Natural Regeneration Areas (Pre-Construction)

**Associated Works**

275 kV Switching Station*

Switching Station Access*

275 kV Cable Trench*

*Associated works subject to separate consent. Footprints show indicative locations / routes only.

## Key

- Site Boundary
- Development Area
- Loch Kemp Surface Area (Existing)
- Maximum Inundation Area (Upper Reservoir)
- Powerhouse Building
- Powerhouse Platform, Quayside and Pier
- Temporary Laydown Area
- Main Welfare Compound
- Indicative Borrow Pit Excavation
- Underground Tunnel
- Dam
- Temporary Cofferdam
- Construction and Operational Access Track (4m Wide Running Surface)
- Construction and Operational Access Track (8m Wide Running Surface, Reinstated to 4m Where Feasible)
- Construction and Operational Access Track Within SAC
- Temporary Construction Access Track (8m Wide Running Surface)
- New Estate Water Supply
- Inlet / Outlet Excavation
- Inlet / Outlet Structure
- Surge Shaft
- Cable Shaft
- Access Tunnel Adit
- Control Kiosk
- Temporary Site Compound
- Security Compound
- Relocated Estate Fishing Lodge

**Loch Kemp Storage EIA Report**

**Figure 14.1.2 Site Layout**

**Drawn by:** SLR **Date:** 14/11/2023

**Drawing:** 04707.00032.0035.0

Loch Kemp Storage
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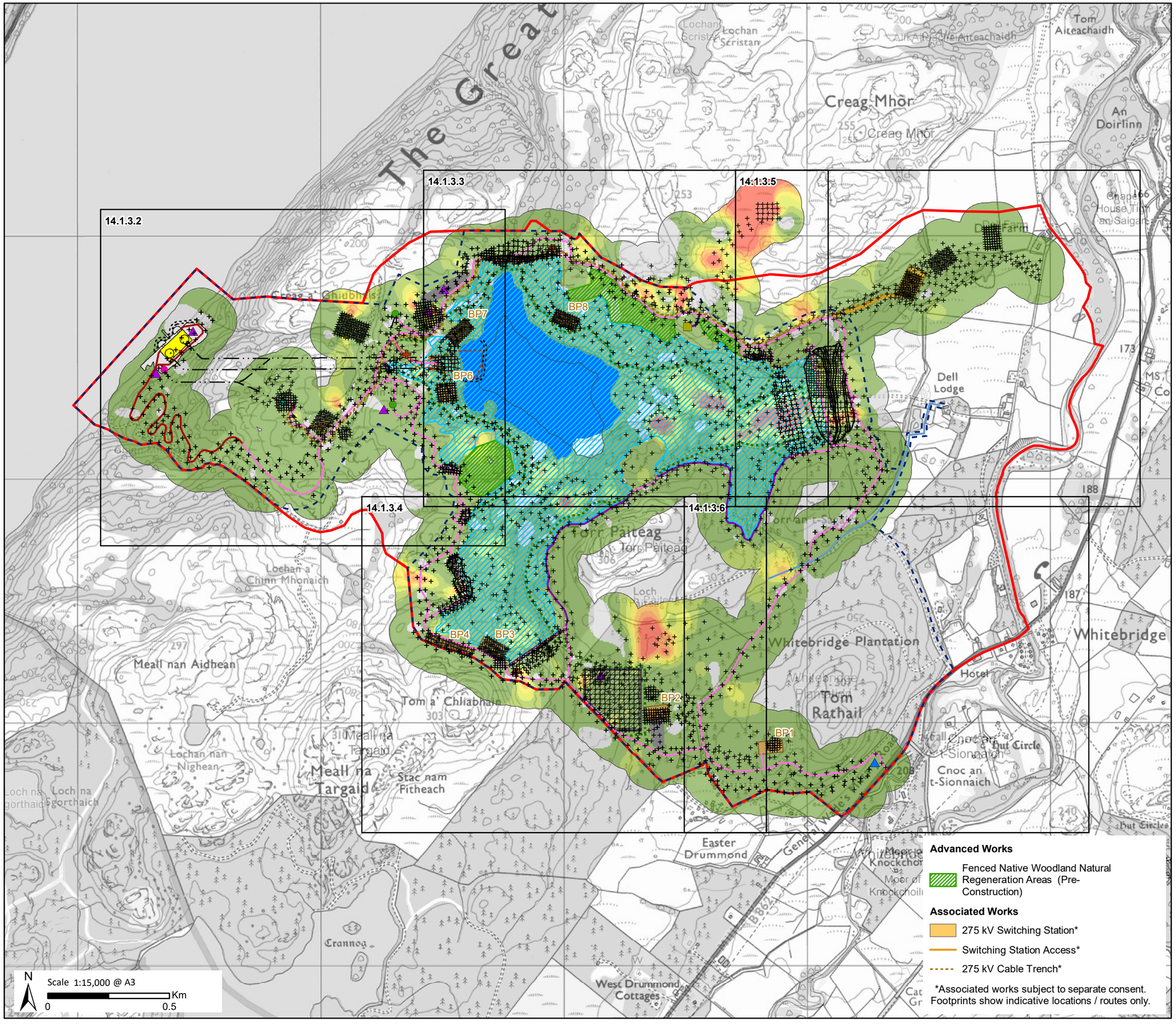


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275 kV Cable Trench*

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Site Boundary

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Powerhouse Building

Powerhouse Platform, Quayside and Pier

Temporary Laydown Area

Main Welfare Compound

Indicative Borrow Pit Excavation

Underground Tunnel

Dam

Temporary Cofferdam

Construction and Operational Access Track (4m Wide Running Surface)

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Temporary Construction Access Track (8m Wide Running Surface)

New Estate Water Supply

Inlet / Outlet Excavation

Inlet / Outlet Structure

Surge Shaft

Cable Shaft

Access Tunnel Adit

Control Kiosk

Temporary Site Compound

Security Compound

Relocated Estate Fishing Lodge

Peat Probe Location

**Peat Depth (m)**

0

0 - 0.5

0.5 - 1

1 - 1.5

1.5 - 2

2 - 2.5

2.5 - 3

> 3

**Loch Kemp Storage EIA Report**

**Figure 14.1.3.1 Peat Depth**

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**Drawing:** 04707.00032.0047.0

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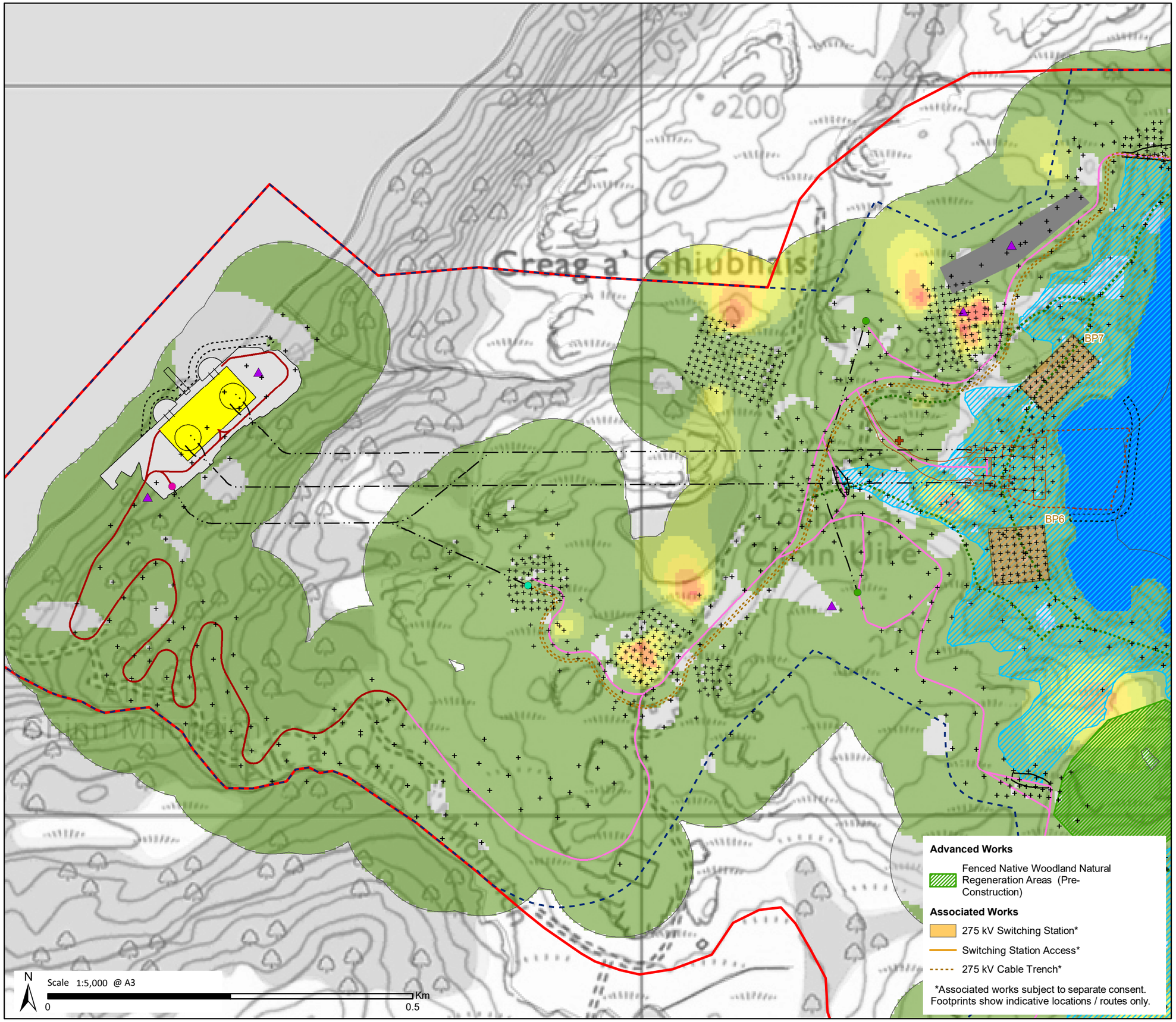


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- Control Kiosk
- Temporary Site Compound
- Security Compound
- Relocated Estate Fishing Lodge
- Peat Probe Location

**Peat Depth (m)**

- 0
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- > 3

**Loch Kemp Storage EIA Report**

**Figure 14.1.3.2 Peat Depth**

**Drawn by:** SLR **Date:** 14/11/2023

**Drawing:** 04707.00032.0047.0

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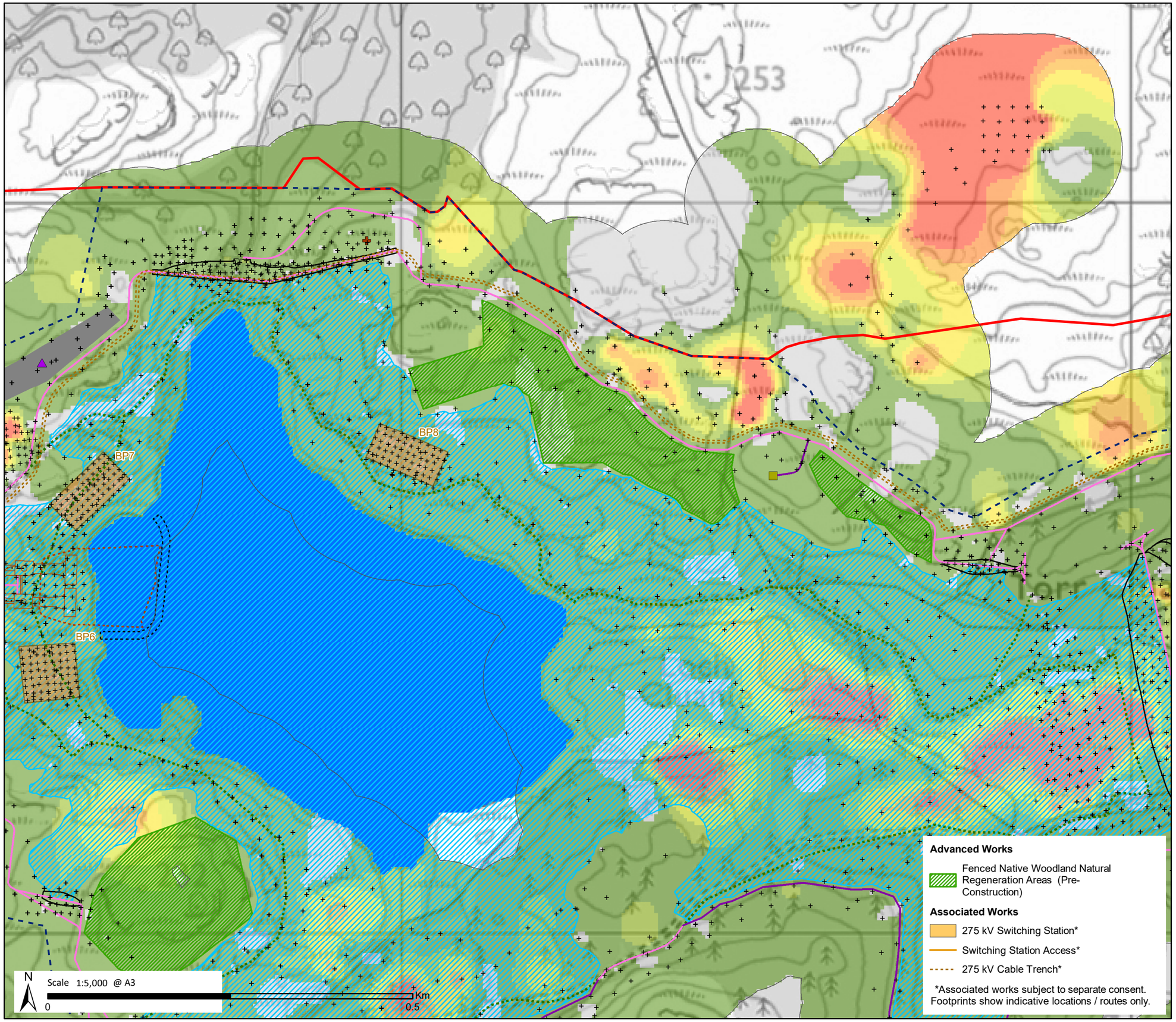


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**Peat Depth (m)**

- 0
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- > 3

**Advanced Works**

- Fenced Native Woodland Natural Regeneration Areas (Pre-Construction)

**Associated Works**

- 275 kV Switching Station*
- Switching Station Access*
- 275 kV Cable Trench*

*Associated works subject to separate consent. Footprints show indicative locations / routes only.

**Loch Kemp Storage EIA Report**

**Figure 14.1.3.3 Peat Depth**

**Drawn by:** SLR **Date:** 14/11/2023

**Drawing:** 04707.00032.0047.0

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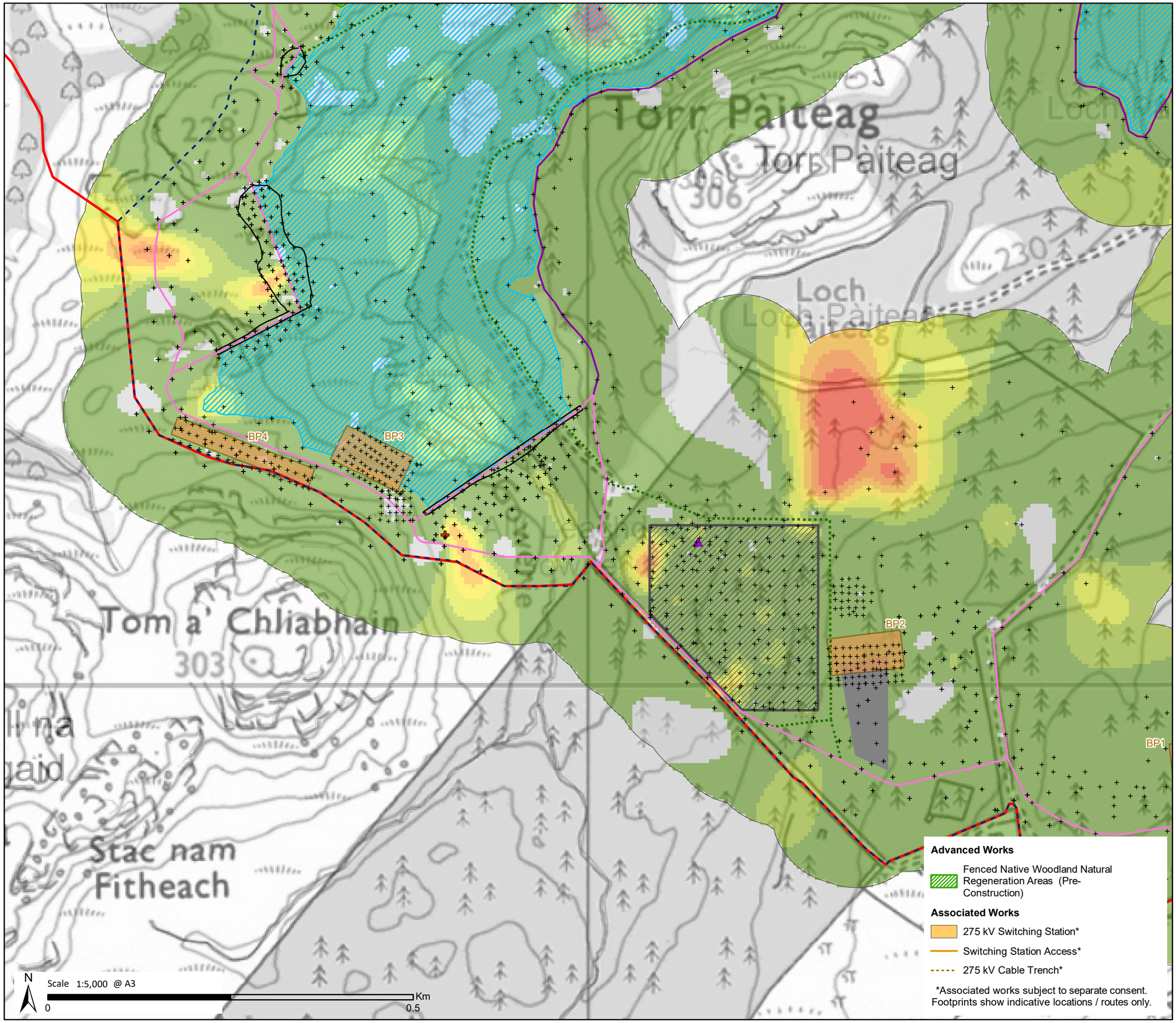


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- Peat Probe Location

**Peat Depth (m)**

- 0
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- > 3

**Loch Kemp Storage EIA Report**

**Figure 14.1.3.4**
**Peat Depth**

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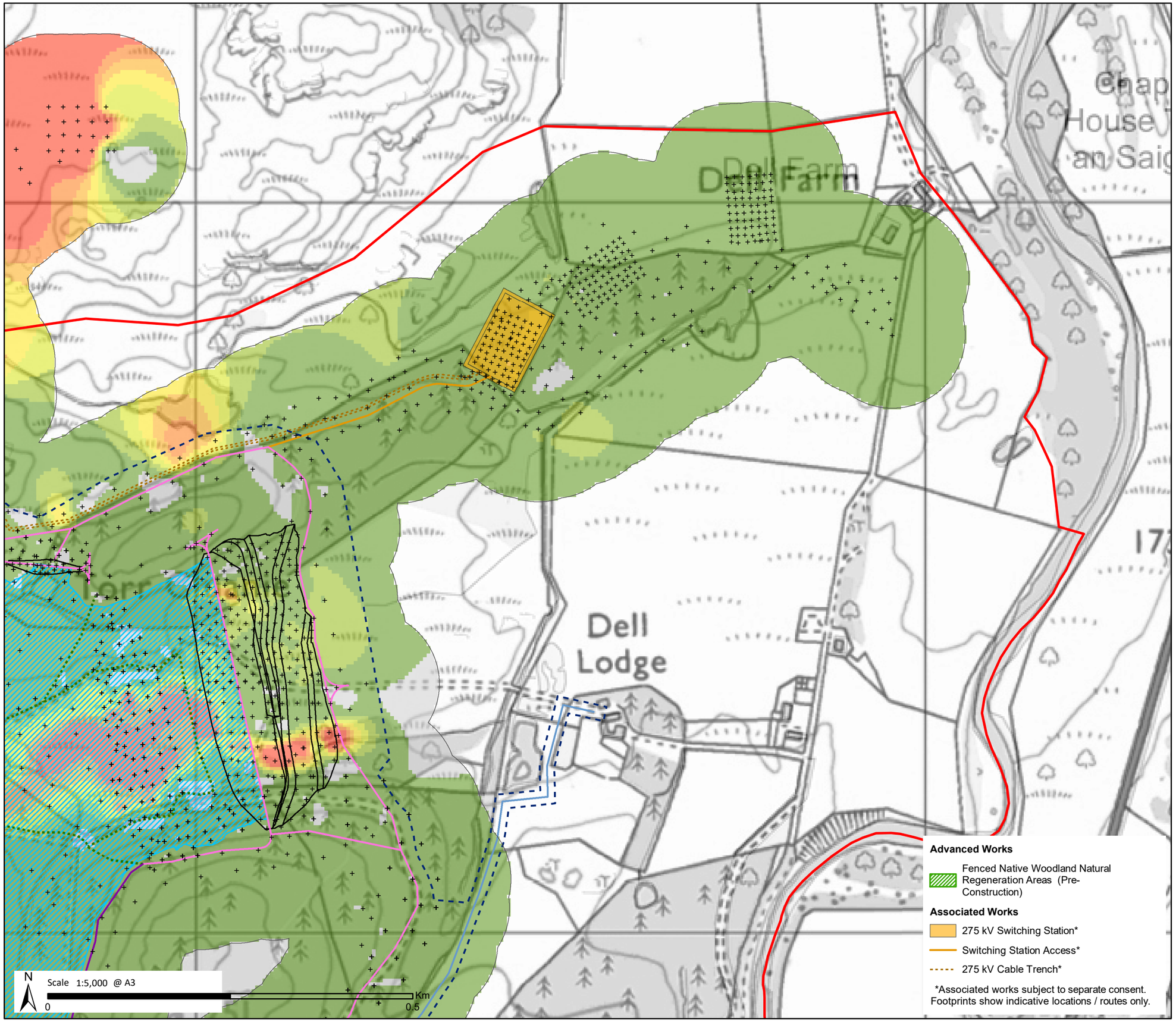


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- Security Compound
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- Peat Probe Location

**Peat Depth (m)**

- 0
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- > 3

**Loch Kemp Storage**
**EIA Report**

**Figure 14.1.3.5**
**Peat Depth**

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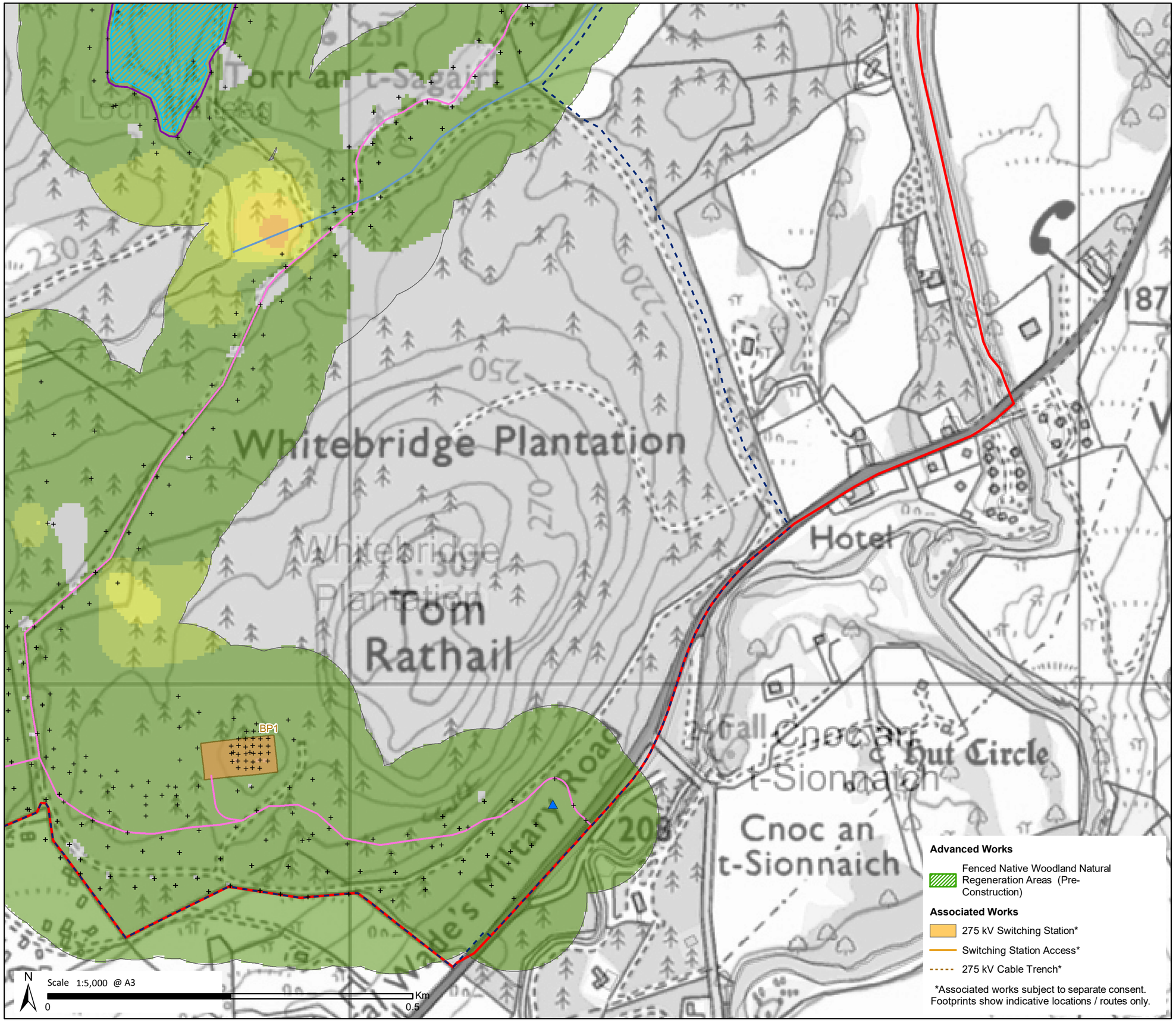


**Advanced Works**

Fenced Native Woodland Natural Regeneration Areas (Pre-Construction)

**Associated Works**

275 kV Switching Station*

Switching Station Access*

275 kV Cable Trench*

*Associated works subject to separate consent. Footprints show indicative locations / routes only.

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- Cable Shaft
- Access Tunnel Adit
- Control Kiosk
- Temporary Site Compound
- Security Compound
- Relocated Estate Fishing Lodge
- Peat Probe Location

**Peat Depth (m)**

- 0
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5

**Loch Kemp Storage**
**EIA Report**

**Figure 14.1.3.6**
**Peat Depth**

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**Drawing:** 04707.00032.0047.0

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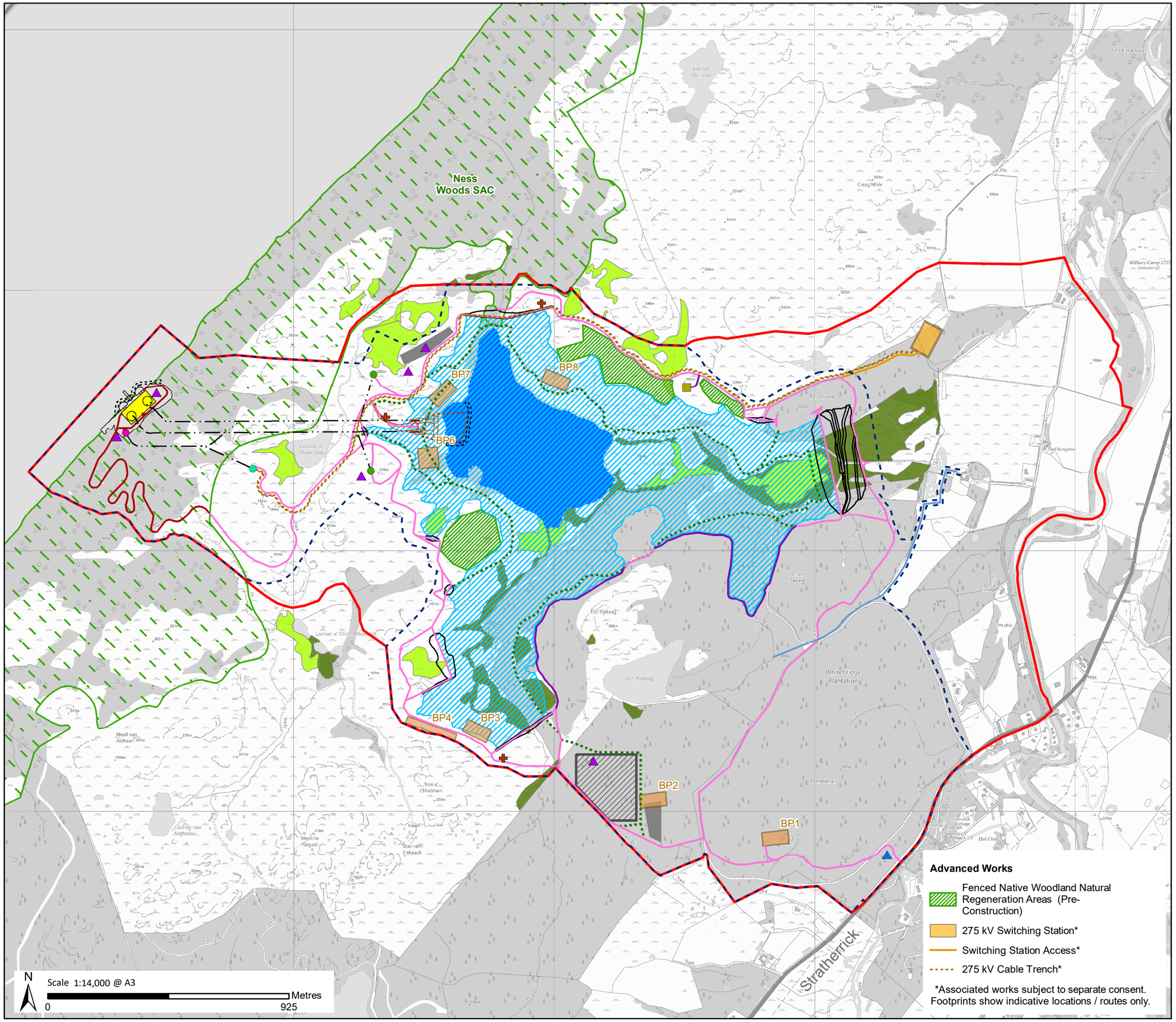


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- Construction and Operational Access Track Within SAC
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- Inlet / Outlet Excavation
- Powerhouse
- Dam
- Access Tunnel Adit
- Cable Shaft
- Surge Shaft
- Control Kiosk
- Temporary Site Compound
- Security Compound
- Relocated Estate Fishing Lodge
- Ness Woods SAC

**Peat Condition**

- Near-natural Condition
- Drained

**Loch Kemp Storage**
**EIA Report**

**Figure 14.1.4**
**Peat Condition**

**Drawn by:** SLR **Date:** 14/11/2023
**Drawing:** 04707.00036.00050.0

Loch Kemp Storage
A STATERA COMPANY

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# Annex A Excavated Materials Calculations

## Technical Appendix 14.1: Peat Management Plan

**Loch Kemp Pump Storage Scheme**

**Loch Kemp Storage**

SLR Project No.: 428.04707.00032

13 November 2023

| Infrastructure | Length (m) | Width (m) | Area ($m^2$) | Average Depth (m) | Number | Total Excavated Volume Peaty Soils ($m^3$) | Total Excavated Volume Peat ($m^3$) | Length (m) | Width (m) | Area ($m^2$) | Average Depth (m) | Number | Total Re-use Volume of Peaty Soils ($m^3$) | Total Re-use Volume of Peat ($m^3$) | Balance of Peaty Soils ($m^3$) | Balance of Peat ($m^3$) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Construction and Operational Access Track within SAC (6m Wide Running Surface Reinstated to 4m) | 1911 | 6 | 11466 | 0.07 | 1 | 803 | | 1911 | 2 | 2867 | 0.50 | 2 | 2867 | | -2064 | | |
| Construction and Operational Access Track (8m Wide Running Surface, Reinstated to 4m) | 14152 | 8 | 113214 | 0.17 | 1 | 19246 | | 14152 | 2 | 21228 | 0.50 | 2 | 21228 | | -1981 | | |
| Construction and Operational Access Track (4m Wide Running Surface) | 1905 | 4 | 7620 | 0.14 | 1 | 1067 | | 1905 | 2 | 2857 | 0.50 | 2 | 2857 | | -1791 | | |
| Temporary Construction Access Track (8m Wide Running Surface) | 6904 | 8 | 55232 | 0.20 | 1 | 11046 | | 6904 | 8 | 55232 | 0.20 | 1 | 11046 | | 0 | | |
| Powerhouse Building | | | 7568 | 0.00 | 1 | 0 | | | | | | | 0 | | 0 | | No peat or organic soils noted |
| Substation | | | 9686 | 0.27 | 1 | 2615 | | 400 | 2 | | 0.50 | 1 | 400 | | 2215 | | |
| Temporary Laydown Area N | | | 8245 | 0.10 | 1 | 825 | | | | 8245 | 0.10 | 1 | 825 | | 0 | | |
| Temporary Laydown Area S | | | 4244 | 0.12 | 1 | 509 | | | | 4244 | 0.12 | 1 | 509 | | 0 | | |
| Main Welfare Compound | | | 51410 | 0.32 | 1 | 16451 | | 720 | 2 | | 0.50 | 1 | 720 | | 15731 | | |
| Powerhouse Platform, Quayside and Pier | | | 24743 | 0.00 | 1 | 0 | | | | | | | 0 | | 0 | | No peat or organic soils noted |
| Cable Trench to Substation | 3315 | 3.5 | 11603 | 0.14 | 1 | 1624 | | 3315 | 3.5 | 11603 | 0.14 | 1 | 1624 | | 0 | | |
| Inlet / Outlet Structure | | | 7844 | 0.13 | 1 | 1020 | | | | | 0.13 | 1 | 0 | | 1020 | | |
| Dam 1 | | | 5380 | 0.16 | 1 | 861 | | | | | 0.16 | 1 | 0 | | 861 | | |
| Dam 2 | | | 1402 | 0.08 | 1 | 112 | | | | | 0.08 | 1 | 0 | | 112 | | |
| Dam 3 | | | 57214 | 0.65 | 1 | | 37189 | | | | 0.65 | 1 | 0 | | | 37189 | |
| Dam 4 | | | 2337 | 0.22 | 1 | 514 | | | | | 0.22 | 1 | 0 | | 514 | | |
| Dam 5 | | | 9805 | 0.27 | 1 | 2647 | | | | | 0.27 | 1 | 0 | | 2647 | | |
| Dam 6 | | | 995 | 0.17 | 1 | 169 | | | | | 0.17 | 1 | 0 | | 169 | | |
| Dam 7 | | | 720 | 0.15 | 1 | 108 | | | | | 0.15 | 1 | 0 | | 108 | | |
| Dam 8 | | | 467 | 0.03 | 1 | 14 | | | | | 0.03 | 1 | 0 | | 14 | | |
| Borrow Pit 2 | | | 5177 | 0.16 | 1 | 828 | | | | 5177 | 2.00 | 1 | 10354 | | -9526 | | |
| Borrow Pit 3 | | | 5339 | 0.14 | 1 | 747 | | | | 5339 | 2.00 | 1 | 10678 | | -9931 | | |
| Borrow Pit 4 | | | 5274 | 0.14 | 1 | 738 | | | | 5274 | 2.00 | 1 | 10548 | | -9810 | | |
| Borrow Pit 6 | | | 5964 | 0.12 | 1 | 716 | | | | 5964 | 2.00 | 1 | 11928 | | -11212 | | |
| Borrow Pit 7 | | | 5385 | 0.10 | 1 | 539 | | | | 5385 | 2.00 | 1 | 10770 | | -10232 | | |
| Borrow Pit 8 | | | 5218 | 0.11 | 1 | 574 | | | | 5218 | 2.00 | 1 | 10436 | | -9862 | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| **Totals** | | | | | | **63774** | **37189** | | | | | | **106790** | **0** | **-43016** | **37189** | |
| | | | | | | **100963** | | | | | | | **106790** | | **-5827** | | |

| | |
|---|---|
| **Total Excavated Volume ($m^3$)** | **100963** |
| **Total Re-use Volume ($m^3$)** | **106790** |
| **Net Balance ($m^3$)** | **-5827** |

# Annex B Peat Core Data

## Technical Appendix 14.1: Peat Management Plan

**Loch Kemp Pump Storage Scheme**

**Loch Kemp Storage**

SLR Project No.: 428.04707.00032

13 November 2023

# Peat Core Log

**Hole No.** **PC01**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project: Loch Kemp Pumped Storage Scheme | Client: Ash Design + Assessment Ltd. | | Dates: 16-01-2023 |
| Project No: 428.04707.00032 | Logger: RW | Approved By: AH | Coordinates: E: 247668.00 N: 816374.00 |
| Location: Loch Kemp | Hole Type: PC | Level: | Vertical Scale: 1:26 |

| Water | Depth (m) | Sample Type | Depth | Recovery (%) | Depth (m) / Discontinuity Detail | Level (mAOD) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | 0.00 - 0.60 | C | 0.00 - 0.60 | Recovery = 80% | | | | Spongy dark brown pseudo-fibrous PEAT. Frequent plant remains present (H4, B2). |
| | 0.60 - 1.20 | C | 0.60 - 1.20 | Recovery = 100% | | | | |
| | 1.20 - 1.80 | C | 1.20 - 1.80 | Recovery = 100% | 1.80 | | | Peat Core Complete at 1.80m |

**Remarks:**

Peat core recovered using peat sampler.

# Peat Core Log

**Hole No.** **PC02**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project: Loch Kemp Pumped Storage Scheme | Client: Ash Design + Assessment Ltd. | | Dates: 16-01-2023 |
| Project No: 428.04707.00032 | Logger: RW | Approved By: AH | Coordinates: E: 247935.00 N: 816211.00 |
| Location: Loch Kemp | Hole Type: PC | Level: | Vertical Scale: 1:26 |

| Water | Depth (m) | Sample Type | Depth | Recovery (%) | Depth (m) / Discontinuity Detail | Level (mAOD) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | 0.00 - 0.60 | C | 0.00 - 0.60 | Recovery = 100% | | | | Spongy dark brown pseudo-fibrous PEAT. Frequent plant remains present (H4, B2). |
| | 0.60 - 1.20 | C | 0.60 - 1.20 | Recovery = 100% | 1.00 | | | Spongy dark brown pseudo-fibrous PEAT. Occasional plant remains present (H5, B2). |
| | 1.20 - 1.80 | C | 1.20 - 1.80 | Recovery = 100% | | | | |
| | 1.80 - 2.40 | C | 1.80 - 2.40 | Recovery = 100% | | | | |
| | 2.40 - 3.00 | C | 2.40 - 3.00 | Recovery = 100% | | | | |
| | 3.00 - 3.60 | C | 3.00 - 3.60 | Recovery = 100% | | | | |
| | 3.60 - 4.20 | C | 3.60 - 4.20 | Recovery = 100% | 4.20 | | | Peat Core Complete at 4.20m |

**Remarks:**

Peat core recovered using peat sampler.

# Peat Core Log

**Hole No.** **PC03**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project: Loch Kemp Pumped Storage Scheme | Client: Ash Design + Assessment Ltd. | | Dates: 16-01-2023 |
| Project No: 428.04707.00032 | Logger: RW | Approved By: AH | Coordinates: E: 247924.00 N: 816326.00 |
| Location: Loch Kemp | Hole Type: PC | Level: | Vertical Scale: 1:26 |

| Water | Depth (m) | Sample Type | Depth | Recovery (%) | Depth (m) / Discontinuity Detail | Level (mAOD) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | 0.00 - 0.60 | C | 0.00 - 0.60 | Recovery = 100% | | | | Spongy dark brown pseudo-fibrous PEAT. Frequent plant remains present (H4, B2). |
| | 0.60 - 1.20 | C | 0.60 - 1.20 | Recovery = 100% | 1.20 | | | Peat Core Complete at 1.20m |

**Remarks:**

Peat core recovered using peat sampler.

# Peat Core Log

**Hole No.** **PC04**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project: Loch Kemp Pumped Storage Scheme | Client: Ash Design + Assessment Ltd. | | Dates: 18-05-2023 |
| Project No: 428.04707.00032 | Logger: ET | Approved By: AH | Coordinates: E: 248146.00 N: 816253.00 |
| Location: Loch Kemp | Hole Type: PC | Level: | Vertical Scale: 1:26 |

| Water | Depth (m) | Sample Type | Depth | Recovery (%) | Depth (m) / Discontinuity Detail | Level (mAOD) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | 0.00 - 1.00 | C | 0.00 - 1.00 | Recovery = 70% | 1.00 | | | Spongy brown pseudo-fibrous PEAT. Frequent plant remains present (H4, B2). |
| | 1.00 - 2.00 | C | 1.00 - 2.00 | Recovery = 80% | | | | Spongy dark brown pseudo-fibrous PEAT. Occasional plant remains present (H5, B2). |
| | 2.00 - 3.00 | C | 2.00 - 3.00 | Recovery = 100% | | | | |
| | 3.00 - 4.00 | C | 3.00 - 4.00 | Recovery = 100% | | | | |
| | 4.00 - 4.50 | C | 4.00 - 4.50 | Recovery = 100% | 4.50 | | | Peat Core Complete at 4.50m |

**Remarks:**

Peat core recovered using peat sampler.

# Peat Core Log

**Hole No.**
**PC05**
Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project: Loch Kemp Pumped Storage Scheme | Client: Ash Design + Assessment Ltd. | | Dates: 18-05-2023 |
| Project No: 428.04707.00032 | Logger: ET | Approved By: AH | Coordinates: E: 248049.00 N: 816462.00 |
| Location: Loch Kemp | Hole Type: PC | Level: | Vertical Scale: 1:26 |

| Water | Depth (m) | Sample Type | Depth | Recovery (%) | Depth (m) / Discontinuity Detail | Level (mAOD) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|
| | 0.00 - 1.00 | C | 0.00 - 1.00 | Recovery = 100% | | | | Spongy dark brown pseudo-fibrous PEAT. Occasional plant remains present (H5, B2). |
| | 1.00 - 2.00 | C | 1.00 - 2.00 | Recovery = 100% | | | | |
| | 2.00 - 2.50 | C | 2.00 - 2.50 | Recovery = 100% | 2.45<br>2.50 | | | Grey brown slightly clayey fine SAND.<br>Peat Core Complete at 2.50m |

**Remarks:**

Peat core recovered using peat sampler.

**PC01**
0 - 0.60m

**PC01**
0.60 - 1.20m

SLR

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**LOCH KEMP PUMPED STORAGE SCHEME**

ash

Project No. :- 428.04707.00032

Date :- January 2023

**PC01**
1.20 - 1.80m

**PC02**
0 - 0.60m

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**LOCH KEMP PUMPED STORAGE SCHEME**

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Date :- January 2023

**PC02**
0.6 - 1.20m

**PC02**
1.20 - 1.80m

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**LOCH KEMP PUMPED STORAGE SCHEME**

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Date :- January 2023

**PC02**
1.80 - 2.40m

**PC02**
2.40 - 3.00m

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Project No. :- 428.04707.00032

Date :- January 2023

**PC02**
3.00 - 3.60m

**PC02**
3.60 - 4.20m

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**LOCH KEMP PUMPED STORAGE SCHEME**

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Project No. :- 428.04707.00032

Date :- January 2023

**PC03**
0 - 0.60m

**PC03**
0.60-1.20m

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**PC04**
0 – 1.0m

**PC04**
1.0 - 2.0m

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**LOCH KEMP PUMPED STORAGE SCHEME**

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Project No. :- 428.04707.00032

Date :- January 2023

**PC04**
2.0 – 3.0m

**PC04**
3.0 - 4.0m

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**LOCH KEMP PUMPED STORAGE SCHEME**

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**PC04**
4.0 – 4.5m

**PC05**
0 - 1.0m

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**LOCH KEMP PUMPED STORAGE SCHEME**

ash

Project No. :- 428.04707.00032

Date :- January 2023

**PC05**
1.0 – 2.0m

**PC05**
2.0 – 2.5m

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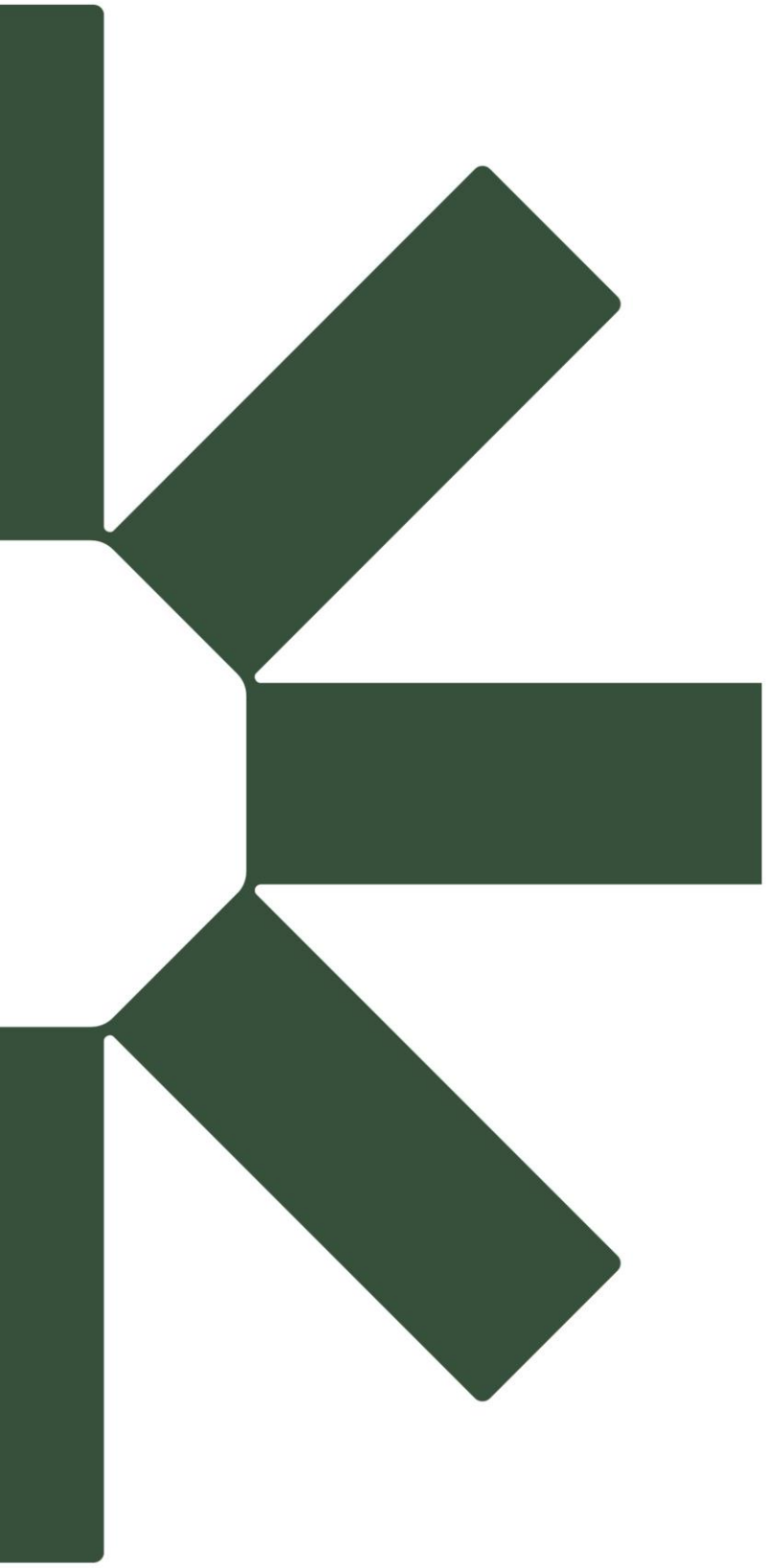
Project No. :- 428.04707.00032

Date :- January 2023



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