March 2025

Glen Earrach Pumped Storage Hydro

Environmental Impact Assessment Report

Volume 5: Appendices
Appendix 15.3: Preliminary Peat Landslide Hazard and Risk Assessment

Glen Earrach Energy Ltd

Glen Earrach AECOM

Quality information

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Issue History

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1. Introduction

1.1. General

1.1.1. Glen Earrach Energy Ltd (the 'Applicant') is proposing to construct a Pumped Storage Hydro (PSH) scheme utilising the existing Loch nam Breac Dearga located on the northwest side of Loch Ness. The Development will abstract and discharge water via an inlet / outlet structure into Loch Ness, which is the largest body of water in the UK. The Proposed Development Site was originally identified to Balmacaan Estate in 2009 by Scottish and Southern Electricity as being one of the best sites in the UK for a large scale (900MW +) long duration (30 GWh) PSH development. It will utilise around 480m of hydraulic head difference between existing lochs at Loch nam Breac Dearga and Loch Ness.

1.1.2. AECOM Ltd (AECOM) has been commissioned to carry out a preliminary Peat Landslide Hazard and Risk Assessment (PLHRA) to confirm the initial infrastructure design phase. This (PLHRA has been undertaken to assess the risk of peat landslides as a result of construction of the Proposed Development. This Preliminary PLHRA should be read in conjunction with **Chapter 15 Geology and Ground Conditions (Volume 2: Main Report)** and **Appendix 15.2 Outline Peat Management Plan (Volume 5: Appendices)**. Additionally, this appendix is supported by the following figures found within **Annex A Figures** at the end of this report:

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1.2. Assessment Team

1.2.1. The assessment works were undertaken by a team of civil engineers, engineering geologists and geotechnical engineers all of whom have previous experience in undertaking peat assessments.

1.2.2. The team was led by a Chartered Engineering Geologist with over 28 years industry experience and in particular within the renewables energy sector. He has managed and assessed geotechnical risks and undertaken geohazard assessments within peatland environments and with a previous employer (Halcrow Group Ltd) also undertook the checkers role on many PLHRA reports on behalf of the Energy Consents Unit (ECU).

1.2.3. The site walkovers and site works (i.e. peat probing) have been undertaken by various teams and personnel including engineering geologists, geotechnical engineers and civil engineers, all of which have experience in working and assessing peatland environments.

1.3. Site Location and Description

1.3.1. The Proposed Development Site is located approximately 9.5 km to the south of Drumnadrochit, and 6.5 km north of Invermoriston within The Highland Council administration region, as shown on **Figure 15.3.1:**

Scheme Location (Annex A Figures). The Proposed Development Site is located around the Loch nam Breac Dearga waterbody at approximate national grid reference (NGR) NH 45255 22395.

1.3.2. The Proposed Development Site is situated on a hilly and undulating landscape with localised access tracks present within. Typically, the land within the Proposed Development Site is undeveloped with heathland, grassland and exposed rock outcrops present. There is no woodland within the proposed Headpond area, with the woodland pockets restricted to the eastern, southern and southwestern boundaries of the Proposed Development Site. These woodlands include plantation woodland along the eastern boundary of the Proposed Development Site alongside the existing Access Track into the Proposed Development Site from Grotaig, and commercial forestry along the A82 and along the existing Access Track into the Proposed Development Site from Alltsigh. The northeast – southwest trending A82 single carriageway is present within the Proposed Development Site towards its southeastern extent, with Loch Ness present further to the southeast at the southeastern extent of the Site. Several other smaller waterbodies and watercourses are present throughout the rest of the Proposed Development Site. An existing Access Track extends north from the main development area of the Proposed Development Site, and ties into the A831 at its northern extent.

1.4. Assessed Areas

1.4.1. The Proposed Development will comprise of the infrastructure set out in **Table 2.2. Description of Development Component Parts** of **Chapter 2 Project and Site Description (Volume 2: Main Report)** and can be viewed in **Figure 15.3.2 Scheme Layout Plans (Annex A Figures)**.

1.4.2. For the purposes of this Preliminary PLHRA only the above ground infrastructure has been assessed. The below ground infrastructure such as tunnels, shafts and the Power Cavern Complex have not been assessed as they are considered to be located at depths underground which are not anticipated to affect the stability of the peat. The locations where these underground structures interact with the ground surface have been assessed, as these may affect the stability of any surrounding peat. It should be noted that blasting may be undertaken to form the Borrow Pit Search Areas (BP Search Areas), Upper Control Works (UCW) (i.e. the Headpond and inlet and outlet structures) and the Tunnel Portal structures for Tunnels. Blasting may also be undertaken to form all underground infrastructure.

1.4.3. Peat restoration and reuse within the Proposed Development Site are covered in **Appendix 15.2 Outline Peat Management Plan (PMP)** and **Appendix 7.6 Outline Peatland Restoration Plan (Volume 5: Appendices)**. As highlighted within the Outline PMP, the proposed peat reuse as part of the Proposed Development is limited to reinstatement of temporary infrastructure (e.g. Access Tracks and Temporary Construction Compounds) and to create verges along Permanent Access Tracks and Permanent Construction Compounds. In relation to the peat reuse for the verges, given the minimal height and widths proposed it is not expected that these will cause significant instability or exposure issues and as such the reuse of peat in this manner is not considered any further as part of this Preliminary PLHRA. In relation to the reuse of peat to reinstate temporary infrastructure, it is acknowledged that the process of distributing and then reusing the peat will weaken its structure and therefore its stability. However, given the limited depth of reinstatement and by following the guidance for the handling and temporary storage of peat as presented in the Outline PMP, it is considered this effect will be minimised. For the purposes of this Preliminary PLHRA, the assessed peat slide hazard is therefore considered to be similar to that of the natural in-situ peat prior to removal as assessed on the relevant peat landslide hazard figure discussed later in this PLHRA. Peat restoration areas are proposed as part of the Proposed Development, however, details on these are still in development and subject to change and as such are not assessed as part of the Preliminary PLHRA. The peat reuse and restoration areas relating to the Proposed Development Site will be revisited as part of the Final PLHRA to be undertaken post-consent, considering the final design of the Proposed Development and considering any new information which becomes available (e.g. Ground Investigation (GI) data).

1.5. Scope of Report

1.5.1. The scope of this report comprises a summary of the methodology used for the Preliminary PLHRA; a review and assessment of the baseline conditions emanating from available geological, hydrogeological and topographic information for the Proposed Development Site; an estimate of the geotechnical hazards and risks associated with peat slides during and post construction; a qualitative risk assessment in relation to the peat encountered; a summary and discussion of potential mitigation and control measures to reduce

the risk caused by the presence of peat; and present any conclusions and recommendations which can be drawn from the information and assessments undertaken as part of this Preliminary PLHRA.

1.5.2. This PLHRA was conducted in general accordance with the guidance provided in Peat Landslide Hazard and Risk Assessments – Best Practice Guide for Proposed Electricity Generation Developments (Scottish Government, 2017) – hereafter referred to as PLHRA: BPG. The guidance suggests a staged approach methodology in relation to the peat stability risk as follows:

- Preliminary Assessment;
- Hazard and Risk Rating;
- Stability Analysis (if required); and
- Detailed Quantitative Risk Assessment (if required).

1.5.3. As part of this PLHRA a qualitative hazard and risk ranking review was undertaken in accordance with the published guidance.

1.5.4. At present, the Proposed Development is still in the initial design stage with only the outline scheme developed. As such, initial intrusive investigations have been undertaken with peat depths estimated through widespread peatland surveys. A quantitative slope stability analysis to estimate factors of safety and a quantitative hazard and risk assessment have therefore not been undertaken at this stage. To allow finalisation of the design for the Proposed Development, further surveys and investigative works (including peat probing and exploratory holes) are to be undertaken.

1.5.5. Development of this PLHRA will require to be undertaken post-consent considering the final design of the Proposed Development (inclusive of the peat reuse areas) and considering any new further information (e.g. investigation data) becoming available. This PLHRA is therefore preliminary.

1.6. Limitations

1.6.1. AECOM does not warrant or guarantee to any party in any way the completeness or accuracy of the documentary information submitted by third parties during the course of this study. Any assessment(s), interpretation(s), conclusion(s) or opinion(s) contained herein is or are made by AECOM in good faith based on information available at the time of compilation of the report and are made for the sole and exclusive use of the Applicant.

1.6.2. AECOM accepts no liability towards third parties for decisions made by any such based on information or statements contained herein. Third parties making use of any information or statement of any kind whatsoever presented or contained within this report or attachments hereto do so at their own risk.

1.6.3. Where peat depth has been determined through peat probing, it should be noted that due to the nature of the probing and as no sample is recovered during the advancement of the probe, the peat depth recorded is only an estimate based on the judgement of the probe operator. More intrusive GI techniques, where samples are recovered, is required to more accurately determine the peat depth.

1.6.4. Peat probing has been undertaken across much of the Proposed Development Site to cover the proposed infrastructure. The whole Proposed Development Site had not been probed on writing this report and there were areas which could not be probed due to steep slopes. Where the peat probe data has been interpolated out to the site boundary from points which are not within 10 m of the boundary, this was undertaken using estimation and judgement. There is therefore the potential for the peat to be different in thickness than predicted, which may increase or decrease the predicted peat slide assessed hazard. More probing and investigation is proposed as part of the Proposed Development and as such data gaps are anticipated to be filled as a result. Where data gaps remain these shall be discussed and assessed further as part of the Final PLHRA undertaken post-consent and following design maturity.

1.6.5. Ground surveys indicate likely conditions but investigate only a relatively small volume of the ground in relation to the size of the Proposed Development Site and can only provide a general indication of site conditions. The comments made and recommendations given in this report are based on AECOMs understanding of the ground conditions at the time of the preparation of this report. There may be exceptional ground conditions on the Proposed Development Site which have not been disclosed and which have therefore not been taken into account in this report.

2. Methodology

2.1. Desk Based Assessment (DBA)

2.1.1. An initial DBA review was undertaken, comprising the review and analysis of available information from sources as detailed below:

- British Geological Survey (BGS) Onshore GeoIndex;
- NatureScot's Carbon and Peatland map 2016;
- Centre for Ecology and Hydrology (CEH), National River Flow Archive (NRFA) (www.ceh.ac.uk/data/nrfa) for flows and rainfall;
- SEPA (www.sepa.org.uk) for river basin management plans, groundwater classification, groundwater vulnerability, water quality and hydrogeology;
- Aerial Photography;
- Ordnance Survey maps and Digital Terrain Model (DTM) for topography;
- Coal Authority Interactive Map Viewer; and
- Groundsure Reports.

2.2. Assessment Approach

2.2.1. A single stage assessment of the peat slide Hazard Ranking has been completed for the Proposed Development. The Hazard Ranking is based on the output from Geographic Information Systems software using a multi-criteria analysis. The outputs generated from the Geographic Information System assessment can be overly conservative in areas and therefore a review of the Hazard Rankings is also undertaken. This review considers the factors contributing to the peat landslide hazard in more detail and rationalises whether the Hazard Ranking can be reduced. The assessment of the Hazard Rankings inclusive of the review and any reduction considered appropriate is presented in **Section 6: Peat Stability** of this PLHRA.

2.2.2. The outputs from the assessment of the Hazard Rankings form the basis of the overall PLHRA outcome and inform whether any mitigation measures are required.

2.3. Additional Relevant Guidance

2.3.1. The following additional good practice guidance was used to inform this assessment:

- SEPA Regulatory Guidance – Developments on Peat and Off-site Uses of Peat [SEPA, 2017];
- Floating Roads on Peat [SNH & FCS, 2010];
- Constructed Track in the Scottish Uplands [SNH, 2015];
- Good Practice during Wind Farm Construction [SR, et al., 2019];
- Guidance on Developments on Peatland, Peatland Survey [Scottish Government, SNH & SEPA, 2017]; and
- Developments on Peatland: Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste [SR & SEPA, 2012].

2.3.2. The 'Good Practice during Wind Farm Construction' document was produced for wind farm developments, however, principles discussed can be considered as good practice for other similar scale developments in areas with similar infrastructure (Access Tracks) and typical ground conditions seen on wind farms, particularly peat and around the water environment.

3. Baseline Environment

3.1. Topography and Slope Analysis

3.1.1. An Ordnance Survey 5 m DTM file was obtained for the Proposed Development Site. This file was used to produce a map of the topography as shown on **Figure 15.3.4 Topography (Annex A Figures)**. A brief summary of the elevation data is also presented below.

3.1.2. Across the west of the Proposed Development Site is Balmacaan Forest, with hill tops and small lochans found throughout. Loch nam Breac Dearga, is in the southwest of the site. In the east is Loch Ness which will serve as the Tailpond, and a small settlement, Grotaig, with minor roads serving it. The Great Glen Way and the A82 running parallel with the edge of Loch Ness, with Ruskich Wood located to the west of this. Within Ruskich Wood and on Loch Ness' shoreline is Primrose Bay, which BGS GeoIndex Onshore identifies an 'Old Red Sandstone (ORS)' supergroup aquifer water well, at depth of 165 m.

3.1.3. The Proposed Development Site is populated with hill tops across the Balmacaan Forest. Meall Fuar-Mhonaidh to the east of Loch nam Breac Dearga sits at 695 m above ordnance datum (AOD), mirrored with Glas-Bheinn Mhór at 651 m AOD to the west, and the centre of the loch itself at 480 m AOD in the valley between. The site slopes from these peaks to the hills surrounding Loch Ness at around 300 m AOD, before a steep reduction in height to between 15-40 m AOD at Loch Ness' shoreline.

3.2. Historic OS Mapping and Aerial Photography Review

3.2.1. A review of available historic OS Six Inch maps on the National Library of Scotland has been undertaken with **Table 1. Summary of Historical OS Maps within Site** providing a summary of the onsite findings. The summary has been supplemented by the information provided in the small scale (1:10,000 and 1:10,560) and large scale (1:1250 and the 1:2,500) OS maps from the Groundsure Reports.

Table 1. Summary of Historical OS Maps within Site

Map Date	On-site Summary
1840s-1880s	• Most of the Proposed Development Site is undeveloped, open moorland with areas of forestry/woodland predominantly in the southeastern/eastern and northeastern/northern extents of the Proposed Development Site. • 2No. sheepfolds identified: one north of Allt Saigh and one north of the River Coiltie just west of where Allt Feith an t-Seilisdeir flows beneath the track. • The lower slopes along the western edge of Loch Ness consists of woodland (Ruskich Wood) with Ruskich Inn present. • The settlements of Inchtellach, Grotaig and Balbeg exist with several wells noted. Dunscriben Fort is noted to be immediately southeast of Grotaig. • An un-named road (present-day A82) exists as well as several tracks including: one north and parallel to Allt Saigh, several in between Ruskich Inn and Balbeg and Allt Coire an Ruighe and several around the northern extents of the Proposed Development Site north along the River Coiltie and near Divach.
1888-1915	• No significant changes. • The track north of All Saigh is no longer shown and the sheepfold in this area is noted as 'Old Sheepfold.' • Expansion of woodland areas noted in the northeastern extents of the Proposed Development Site. • The 1903 map shows the Remains of a Graveyard east of Balbeg (the grave yard is possibly present on the 1875 map edition). • The 1901 – 1903 1:10,560 map shows 'Lon na Fola' located southeast of Meal Fuar-mhonaidh, which is the site of a historic battle (AD 1602).
1968 (1:10,560)	• Alltsigh Access Track (as shown in present-day maps) present. A dam is located at the end of the track (located approximately 500m east of Loch an t-Sionnaich) and a second dam located approximately 250m southeast of Loch an t-Sionnaich.
1975 (1:10,000)	• More paths within Ruskich Wood present (GGW). Ruskich Inn is no longer present. • Primrose Bay is shown on the western bank of Loch Ness. • Further expansion of woodland areas noted in the northeastern extents of the Proposed Development Site.
2010 (1:10,000)	• Path extension within Ruskich Wood.

Map Date	On-site Summary
2024 (1:10,000)	• Extension of track north of River Coiltie down to the river.

3.2.2. No obvious evidence of peat instability features were noted from review of the available historic and current OS mapping or aerial photography.

3.3. Current Land Use

3.3.1. The current land use of the Proposed Development Site was assessed based on recent ordnance survey mapping and aerial imagery available through Bing Maps [Microsoft, 2025] and through consultations with the Applicant.

3.3.2. The existing Access Track which serves the site is through a dedicated forestry plantation (coniferous wood) which has not had any felling or planting activity recently. The Headpond area of the Proposed Development Site is uncoppiced moorland and does not show any recent activity.

3.3.3. The Great Glen Way currently runs alongside Loch Ness, east of Meall Fuar-Mhonaidh. It does not run though the Headpond area and does not interact with the location planned for the Lower Control Works structure in Loch Ness (Tailpond).

4. Geology and Soils

4.1. Introduction

4.1.1. This section provides a review of the available sources of geological information within the Proposed Development Site including published BGS 1:50,000 (50k) and 1:10,000 (10k) scale maps, geological memoirs, and published papers.

4.2. Superficial Geology (Drift Deposits)

4.2.1. **Table 2. Superficial Geology** summarises the superficial geology shown within the Proposed Development Site based on published information. The published BGS 1:50 k superficial map is presented in **Figure 15.3.5 Superficial Geology (Annex A Figures)**. Note that BGS 1:50 k superficial data are only available for the western portion of the Red Line Boundary.

Table 2. Superficial Geology

Superficial Geological Unit	Description [from 1:50k BGS, 2012]	Anticipated Location with Proposed Development Site
Peat	Peat – mainly forms a blanket accumulation of wet, acidic, partially decomposed vegetation.	Pockets of are peat recorded relatively frequently, scattered throughout the Proposed Development Site. The largest areas of peat tend to be in the northeastern Proposed Development Site extents.
Alluvium	Deposits of riverbeds and floodplains. Mainly cobbly gravel capped locally by sandy, peaty 'overbank' deposits.	Rare occurrence within the Proposed Development Site. Generally recorded as pockets of alluvium located near watercourses and / or waterbodies including the River Coiltie, Allt Coire an Ruighe and Grotaig Burn.
Alluvial Fan Deposits	Silty sand, gravel, cobbles and sandy diamicton, forming low-angle cones at tributary mouths.	Rare within the Proposed Development Site. Deposits are small and scattered throughout the Proposed Development Site – some locations include around the southeast and north sides of Meal Fuar-mhonaidh. at Alltsigh where the Allt Saigh watercourse enters Loch Ness, along Allt Coire an Ruighe and at the very northwestern extent of the River Coiltie.
Talus (scree)	Accumulations of clast-supported, angular rock fragments at the foot of crags.	Rare within the Proposed Development Site shown to be northwest of Meal Fuar-mhonaidh
Talus Cone	Matrix-rich accumulations of rock fragments at the foot of gullies.	Only recorded once within the Proposed Development Site northwest of Meal Fuar-mhonaidh

Superficial Geological Unit	Description [from 1:50k BGS, 2012]	Anticipated Location with Proposed Development Site
Glaciofluvial Deltaic Deposits	Flat-topped spreads of sand and gravel, cross-bedded, typically fining downwards into laminated silt and clay, formed when Loch Ness stood 17-20 m above its present level.	Only recorded once within the Proposed Development Site at Alltsigh where the Allt Saigh watercourse enters Loch Ness.
Glaciofluvial Sheet Deposits	Terraced spreads of dense cobbly gravel and sand.	Only recorded once within the Proposed Development Site within the northeastern extent of the Proposed Development Site just south of the River Coiltie.
Hummocky Glacial Deposits / Morainic Deposits	Very poorly sorted and consolidated deposits of boulders, gravel, sand and sandy diamicton forming boulder-strewn mounds.	Recorded to be present in only a few locations within the north and northeastern extents of the Proposed Development Site.
Till	Diamicton, silty, clayey, sandy and stony, very stiff, mainly pale yellowing brown with clasts of micaceous psammite, some granodiorite, porphyry and granite. Uppermost parts generally less consolidated, crudely stratified and sandy.	Occurs in localised areas throughout the Proposed Development Site however, predominantly recorded in the northwestern and northeastern extents.

Notes.

1. *Although not recorded on any of the BGS maps, made ground associated with existing Access Tracks and settlements within the Proposed Development Site is also anticipated.*
2. *A lot of the Proposed Development Site is anticipated to have rock at or near the surface.*

4.3. Solid Geology (Bedrock)

4.3.1. **Table 3. Solid Geology** summaries the bedrock geology anticipated to be present within the Proposed Development Site based on published sources. The published BGS 1:50 k solid geology map is presented in **Figure 15.3.6 Bedrock Geology (Annex A Figures)**.

Table 3. Solid Geology

Geologic Period / Era	Solid Geological Unit (Note 1)	Description	Anticipated Location within Proposed Development Site
Lower Devonian	Mealfuarvonie Sandstone Member. [MVS]	Conglomerate and Breccio-conglomerate. [MVS-CONG]	Anticipated to outcrop and/or underlie the central and southeastern regions of the Proposed Development Site, but also appearing as thin lenses around the northeastern extents of the Proposed Development Site. This unit forms a lot of the main peaks within the Proposed Development Site including Mealfuarvonie, Nighean a' Mhill, Mac a' Mhill, Creag Dhearg and Meall a Choire.
		Pebbly Arkosic Sandstone. [MVS-PESST]	Anticipated to outcrop and/or underlie southeast of the Proposed Development Site and may not outcrop inside the Proposed Development Site boundary
		Fine-grained Sandstone. [MVS-SDST]	Anticipated to outcrop and/or underlie the northeastern, eastern, and southeastern extents of the Proposed Development Site.
Siluro-Devonian	North Britain Siluro-Devonian Calc-Alkaline Dyke Suite.	Feldsparphyric microgranodiorite.	Anticipated as infrequent scattered intrusions within the Achnaconeran Striped Formation only.
		Quartz-microdiorite.	
		Microdiorite.	
		Mafic microdiorite.	
Pre-Cambrian	Un-named Meta-Igneous Rocks.	Amphibolite and hornblende-schist.	Anticipated as relatively frequent, scattered intrusions within the Achnaconeran Striped Formation only.

Geologic Period / Era	Solid Geological Unit (Note 1)	Description	Anticipated Location within Proposed Development Site
Pre-Cambrian	Achnaconeran Striped Formation. [ACHN]	Interbedded Psammite and semipelite. [ACHN-PSSP]	Anticipated to outcrop and/or underlie the northern, western and southwestern regions of the Proposed Development Site. May also underlie the Mealfuarvonie Sandstone Member at unknown depth.

Table notes:
1) Solid geological material may be locally faulted to form breccia (a coarse angular deposit which is different to Breccio-deposits that have a similar texture), or cataclasite that is a mixture of coarse grains in a fine matrix.

4.3.2.

4.4. Soil Survey Information

4.4.1. The National Soil Map of Scotland indicates that the following soil types are present within the Proposed Development Site.

- Peaty gleys: Recorded to comprise much of the western and southwestern extents of the Proposed Development Site, which are recorded with the following information:
  - Parent Material: Drifts derived from schists, gneisses, granulites and quartzites principally of the Moine Series; and
  - Landforms: Undulating hills with gentle and strong slopes; moderately rocky.
- Mineral Podzols: Recorded to comprise much of the north, eastern, and southern extents of the Proposed Development Site, which are recorded with the following information:
  - Parent Material: Drifts derived from schists, gneisses, granulites and quartzites principally of the Moine Series; and
  - Landforms: Hills and undulating lowlands with gentle and strong slopes; moderately rocky.
- Peat: Recorded only in an area in the northeastern extent of the Proposed Development Site and at the very northwestern boundary, which is recorded with the following information:
  - Parent Material: Organic Deposits; and
  - Landforms: Uplands and northern lowlands with gentle and strong slopes.
- Montane Soils; Recorded only in one area around Glas-bheinn Mhor, which is recorded with the following information:
  - Parent Material: Drifts derived from schists, gneisses, granulites and quartzites principally of the Moine Series; and
  - Landforms: Mountains with gentle and strong slopes; none to moderately rocky.
- Immature Soils.: Recorded around Nighean a ’Mhill, Meal Fuar-mhonaidh and Creag Dearg, which are recorded with the following information:
  - Parent Material: Drifts derived from Middle and Lower Old Red Sandstone (LORS) conglomerates; and
  - Landforms: Hills with strong to very steep slopes; very rocky.
- Peaty Podzols: Recorded only in a small area in the very southern extent of the Proposed Development Site, which is recorded with the following information:
  - Parent Material: Drifts derived from schists, gneisses, granulites and quartzites principally of the Moine Series; and
  - Landforms: Rugged hills with strong and steep slopes; very rocky.

4.4.2. The soil survey information from the National Soil Map of Scotland is generally consistent with the geology observed during the surveys undertaken across the Proposed Development Site.

4.5. Mining and Quarrying

Coal Mining (Historic and Current)

4.5.1. The Coal Authority Interactive Map Viewer indicates that the Proposed Development Site is not within a coal mining reporting area.

4.5.2. Additionally, the available Groundsure Reports and historical maps record no coal mining related features or underground workings within the Proposed Development Site.

4.5.3. There is therefore no evidence of any current coal mining recorded within the Proposed Development Site.

Quarrying (Historic and Current)

4.5.4. No historic quarrying activities within the Proposed Development Site were identified from the historical mapping.

4.5.5. The available information from the 'Mines and Quarries' Layer on the BGS GeoIndex and the Groundsure Reports records two pits along the upslope side of the A82 around where an un-named watercourse enters Loch Ness. Both pits are named 'Leum a' Cheannaiche Pit.' The Area 3 Groundsure Report states that both these pits have ceased operations and were for the extraction of sandstone and sand & gravel.

4.6. Hydrogeology

4.6.1. Information from the BGS 1:625,000 scale hydrogeology map, the BGS aquifer productivity report and the Groundsure Reports have been reviewed to provide the information included within this section.

4.6.2. Although superficial deposits are only locally recorded across the Proposed Development Site, the following is indicated regarding superficial aquifers:

- The till and hummocky glacial deposits / morainic deposits encountered within the Proposed Development Site and are typically classified as a not a significant aquifer.
- The rare glaciofluvial deposits encountered within the Proposed Development Site are classified as high productivity aquifers with intergranular flow and potential yields of >10 l/s.
- The rare talus / alluvial fan deposits encountered within the Proposed Development Site are classified as low to moderate productivity aquifers with intergranular flow and potential yields from 0.1 to 10 l/s.
- The rare alluvium deposits encountered within the Proposed Development Site, if dominated by sand and gravel, are classified as moderate to high productivity aquifers with intergranular flow and potential yields from 1 to >10 l/s. If the deposits are dominated by clay or silt, then they are likely to be classified as not a significant aquifer.
- The report used to estimate the aquifer productivity does not consider peat.

4.6.3. Information regarding the bedrock aquifers indicates:

- The LORS (i.e. the MVS located in the eastern extents of the Proposed Development Site) is a moderately productive aquifer with flow virtually all through fractures and other discontinuities. It is a locally important multi-layered aquifer with potential yields of 1 to 10 l/s.
- The Glenfinnan Group (i.e. the ACHN located in the western extents of the Proposed Development Site) is a low productivity aquifer with flow virtually all through fractures and other discontinuities with potential yields of 0.1 to 1 l/s. Small amounts of groundwater in near surface weathered zone and secondary fractures.

4.7. Hydrology

4.7.1. The Proposed Development Site is predominantly located within the catchment of the Allt Saigh watercourse. The Allt Saigh is fed by several smaller streams and lochans in the mountains to the west of

Loch Ness, which it flows into at Alltsigh. Flow in the upper reaches of the catchment is diverted via a dam to the Livishie power station.

4.7.2. There are several watercourses recorded to flow through the Proposed Development Site as follows:

- River Enrick, which typically flows west to east. This watercourse only crosses the Proposed Development Site at the northern-most Access Track at Balnain. There are many tributaries which drain into the river, the most relevant ones being those from the south that pass through the Affric/Kintail Way access track.
- River Coiltie, which typically trends southwest to northeast. This watercourse flows along the northern boundary of the Proposed Development Site and enters Loch Ness outside of the Proposed Development Site at Urquhart Bay. There are many tributaries within the northern extents of the Proposed Development Site which drain into the River Coiltie including Allt Feith an t-Seilisdeir (flows into the river from the northwest), Allt Glas Mor (flows into the river from the southwest) and a number of un-named watercourses.
- Allt Coire an Ruighe, which typically trends southwest to northeast. This watercourse starts around Nighean a 'Mhill and several tributaries within the northeastern extents of the Proposed Development Site drain into the watercourse.
- Grotaig Burn, which typically trends southwest to northeast. This watercourse starts in the southeastern side of Meal Fuar-mhonaidh and flows northeast through Grotaig before entering Loch Ness at the A82. Additionally, there are several un-named tributaries within the eastern extents of the Proposed Development Site that drain into Grotaig Burn.
- Allt Saigh, which typically flows west to east. This watercourse flows along the southern boundary of the Proposed Development Site and enters Loch Ness at Alltsigh. Many tributaries which drain the slopes within the southwestern extents of the Proposed Development Site flow into Allt Saigh.
- An unnamed watercourse, which typically flows northeast to southeast. This watercourse is located south of Meal Fuar-mhonaidh and flows through Ruskich Wood before entering Loch Ness at the A82.

4.7.3. There are several waterbodies recorded within the Proposed Development Site as follows:

- Loch nam Breac Dearga (proposed Headpond) located immediately northwest of Meal Fuar-mhonaidh. Water from this loch forms a tributary that flows into Allt Saigh.
- Loch nan Eun located immediately southwest of Carn Ban). Water from this loch forms some of the tributaries which flow into the River Coiltie.
- Loch Dubh located north of Meall a Choire in the eastern extent of the Proposed Development Site. Water from this loch forms a tributary which flows into Allt Coire an Ruighe.
- Loch an t-Sionnaich located on the western boundary of the Proposed Development Site. Water from this loch forms a tributary which flows into Allt Saigh.
- Loch a' Bhealaich located south of Meal Fuar-mhonaidh. Water from this loch forms a tributary which flows into Allt Saigh.
- Loch Ness located along the eastern perimeter of the Proposed Development Site. All watercourses on the Proposed Development Site eventually drain into this loch.

4.7.4. **Figure 15.3.7 Hydrology (Annex A Figures)** shows the recorded hydrological features within the Proposed Development Site.

4.8. Climate

4.8.1. The rainfall data for the Proposed Development Site has been obtained through review of the catchment information tab relating to specific measurement gauges along watercourses, available from the NFRA search data page [NRFA, 2024].

4.8.2. Standard Average Annual Rainfall (SAAR 1961-1990) calculated using the Flood Estimation Handbook for the river gauging station located on the River Moriston at Levishie, has an annual average rainfall of 2,131mm, meaning the Proposed Development Site is particularly wet in the UK context. High rainfall may

influence pollution control during construction. This NRFA web page indicated three gauging stations are located within 10km of the Proposed Development Site as follows:

- Located on the River Enrick at Mill of Tore, approximately 7.5 km northwest of the Headpond;
- Located on the River Moriston at Levishie, approximately 7.3 km southwest of the Headpond; and
- Located on the River Moriston at Invermoriston, approximately 7 km southwest of the Headpond.

4.8.3. **Table 4. NRFA Rainfall Data** shows the annual average rainfall recorded from each of these gauging stations.

Table 4. NRFA Rainfall Data

Gauging Station	NGR	Gauge ID	Station Level (AOD m)	Period of Record	Annual Average Rainfall (mm)
Enrick at Mill of Tore	NH450299	6008	111.10	1979 - 2023	1290
Moriston at Levishie	NH402174	6009	46.10	1994 - 2011	2131
Moriston at Invermoriston	NH416169	6003	40.70	1929 - 1945	2115

4.8.4.

4.8.5. Additionally, UKCP18 climate model projections for the UK produced by the UK Meteorological Office can be used to provide observations and climate change projections. The rainfall projection data for the Proposed Development Site is shown in **Table 5. UKCP18 Rainfall Data**.

Table 5. UKCP18 Rainfall Data

Climate Variable		Climate Change Projection RCP 8.5		
	Baseline (1981 – 2010) Fort Augustus	Extreme scenario RCP 8.5 (2020-2049)	Extreme scenario RCP 8.5 (2030-2059)	Extreme scenario RCP 8.5 (2070-2099)
Mean annual rainfall (%)	1336.4	-0.01	-0.02	-3.28
		(-6.13 to 3.78)	(-7.11 to 3.45)	(-10.22 to +3.62)
Mean summer rainfall (%)	70.7	-0.03	-0.06	-23.85
		(-17.30 to 11.24)	(-23.19 to 12.62)	(-47.22 to +5.11)
Mean winter rainfall (%)	158	-0.02	-0.02	-1.2
		(-10.32 to 6.65)	(-10.05 to 7.77)	(-14.38 to +14.61)

4.9. Flooding

4.9.1. Flooding information relevant to the Proposed Development Site has been obtained as part of the Groundsure Report. This source records river flooding as greater than 1m flood depth risk from a 1 in 30-year storm within the areas of the River Coiltie and Loch Ness.

4.9.2. In relation to surface water flooding risk, the Groundsure Reports indicate that the highest risk is a greater than 1 m depth flood risk from a 1 in 30-year storm recorded within the ground level area of the proposed Power Cavern Complex and is associated with the River Coiltie, Allt Coire an Ruighe and associated tributaries and Grotaig Burn.

4.9.3. In relation to groundwater flooding risk, the Groundsure Reports indicate that the highest risk is moderate. This is recorded within the area of the proposed Power Cavern Complex and appears to be associated with water bodies within the Proposed Development Site including Loch nam Breac Dearga and the un-named water bodies located to the north of this.

4.10. Geomorphology

4.10.1. The geomorphology of the Proposed Development Site is dominated by the topography and resulting drainage pattern. The topography of the Headpond is dominated by Meall Fuar-mhonaidh to the west of the proposed Headpond location. To the north of the Headpond is the smaller Nighean a Mhill hill, and

Glas-bheinn Mhor hill to the east. These reliefs dictate the shape of the Headpond, and the locations of the proposed Embankments have been placed accordingly.

4.10.2. The southern side of the Headpond location is generally flatter, therefore the drainage patterns trends towards the south of the proposed Headpond location, with most of the water generated in the Headpond area flowing south into Allt Saigh and subsequently in to Loch Ness.

4.10.3. Past Glas-bheinn Bheag to the north, the topography flattens out and the rivers/lochs located in the area flow towards the River Coiltie which flows into Loch Ness.

5. Site Surveys

5.1. Peatland Surveys

5.1.1. As per the requirements set out in NPF4 and relevant best practice guidance, due to the presence of peat across the Proposed Development Site, peatland surveys were undertaken to quantify the extent of peatlands within the Proposed Development Site.

5.1.2. The probes used consisted of lightweight non-conductive fibreglass rods and handles which are nominally 0.9 m in length with threaded joints allowing extension of the probe as required. The probe was manually pushed through the peat at each location until one of the following occurred:

- Refusal of the peat probe.
- Recognisable change in the stiffness in the ground; or,
- Regular granular material could be felt scrapping along the probe.

5.1.3. Due to the nature of peat probing and as no sample is recovered during the advancement of the probe, the peat depth determined is only an estimate based on the judgment of the probe operator. More intrusive investigation techniques would be required to determine the depth of peat more accurately.

5.1.4. The following surveys have been undertaken for the Proposed Development:

- Phase 1 Peatland Survey was undertaken by AECOM during June 2024 and comprised of 1,309. probes. The probing plan was developed in accordance with best practice guidance published by the Scottish Government, NatureScot and SEPA (2017) and consultation with SEPA, as set out in **Table 15-3 Summary of Consultation Responses to Geology and Soils** of **Chapter 15 Geology and Ground Conditions (Volume 2: Main Report)**. The following approach was adopted for the Phase 1 Survey:
  - 100 m x 100 m grid across the Headpond, the expected construction compound and the Access Track locations;
  - 500 m x 500 m grid across the area to the northwest of the Headpond where there is no expected development; and
  - Check probes in areas of deeper peat across the survey area.

5.1.5. As a result of breeding birds in parts of the required survey area, part of the Phase 1 Peatland Survey was not completed. These outstanding probes were reviewed and relevant probes were included in the Phase 2 Survey.

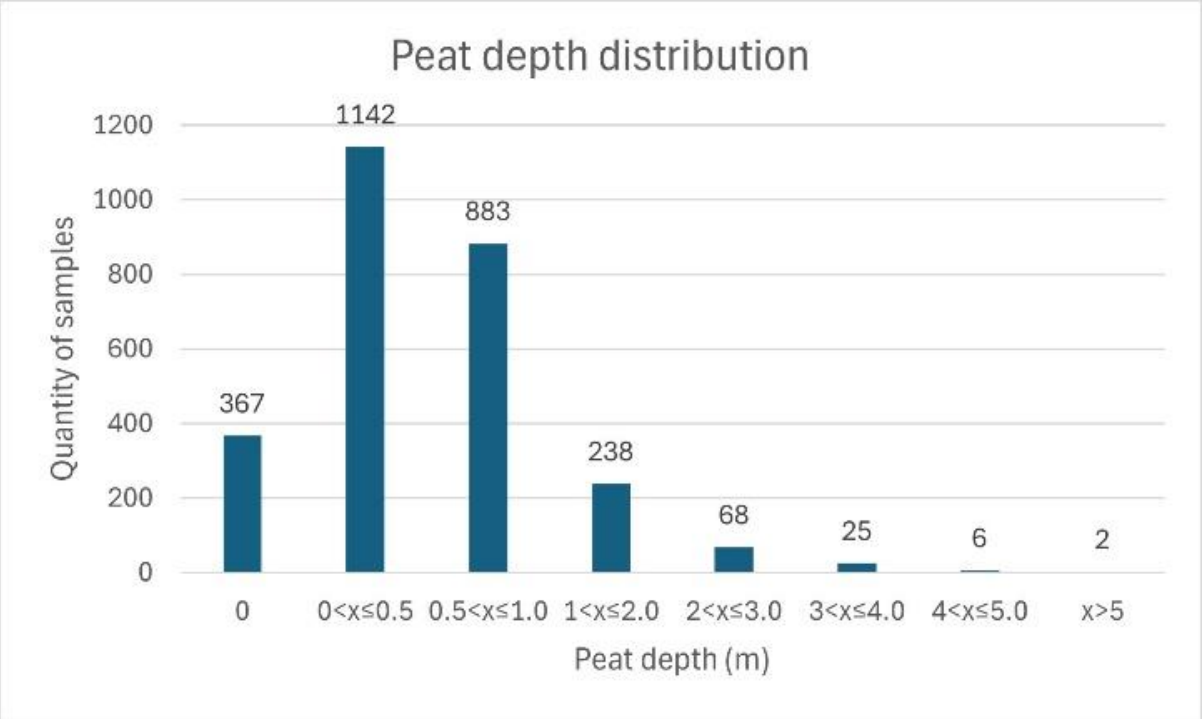
- Phase 2 Peatland Survey was undertaken in October 2024. Prior to mobilisation, consultation was had with SEPA and the following probing regime was agreed upon:
  - 100 m x 100 m grid around Saddle Dam 2 and Saddle Dam 3 where inaccessible due to breeding birds during the Phase 1 Survey;
  - Targeted probing at 50 m centres with 10 m perpendicular offsets along proposed Access Track alignments; and
  - Targeted probing at 50 m centres with 10 m perpendicular offsets along existing Access Track alignments.

5.1.6. Notes gathered during the Peat Surveys are as follows and can be seen on **Figure 15.3.3 Site Walkover Features (Annex A Figures).**

- The northeast access to the Proposed Development Site, accessible via Balbeg village, is a high-quality forestry Access Track with a number of passing places.
- Across the Headpond there are large areas of shallow or no peat with a number of small pockets of deeper peat in naturally occurring basins in the bedrock.
- Peat depth only reached > 3 m at a small number of locations tested, with only one point measuring a depth of greater than 5 m.
- To the north of the Headpond the peat was generally only found in the valleys between hills.
- The river valley located north of Saddle Dam 2 is extremely steep and provided a significant challenge when probing across it.

5.1.7. In total approximately 2,730 probes were taken across the Phase 1 & Phase 2 Peatland Surveys. The results are show graphically in **Insert 1. Peat Depth Distribution**.

5.1.8. Figures 15.3.8 Peat Probe Survey Results (Volume 5: Appendices) and Figure 15.3.9 Peat Depth Interpolation Plan (Volume 5: Appendices) show the extent of peat probing and the interpolated peat depth surface and illustrate that there is shallow peat across most of the proposed Headpond area, with localised deeper peat deposits towards the north Loch Nam Breac Dearga.



Insert 1. Peat Depth Distribution

6. Peat Stability

6.1. General Information on Peat

6.1.1. The BGS describe peat as a "partially decomposed mass of semi-carbonized vegetation which has grown under waterlogged, anaerobic conditions, usually in bogs or swamps." [BGS, 2024].

6.1.2. Peat is characterised as generally having an extremely high water content, high organic content, low bulk and dry densities, low shear strength and very high compressibility [O'Kelly, 2017]. PLHRA: BPG provides further information on the characteristics of peat indicating that dry peat is typically 90 – 95% organic matter and that it has special hydrological properties with water contents of around 90%.

6.1.3. Peat deposits are split into two layers an upper acrotelm and a lower catotelm. The acrotelm is typically <0.6 m deep and is where there is a living root system which helps to loosely bind the plant remains together with a normal level of water table fluctuations also within the layer. The catotelm is a more decomposed layer which is below the water table level and is waterlogged [O'Kelly, 2017]. The position of the water table therefore controls the level of acrotelm and catotelm deposits which therefore control the stability of the peat deposits.

6.1.4. BS 5930 [BSI, 2020] provides a means for describing peat in the field in the form fibrous peat, pseudo-fibrous peat and amorphous peat. Fibrous peat is described as having clearly recognisable plant remains with the deposits also retaining some tensile strength. Pseudo-fibrous peat is described as a mixture of plant fibres and amorphous peat paste. Amorphous peat is described as having no recognisable plant remains with the deposits also having a 'mushy' consistency. The degree of decomposition of the peat can be further estimated in the field by applying the von Post Scale of humification which ranges from H1 (no decomposition) to H10 (totally decomposed) [von Post, 1924].

6.1.5. The PLHRA: BPG records three different naming conventions depending on the depth of the peat deposits. These are listed as follows:

- Peaty Soil – a peat or surface organic soil with a depth of <0.5 m;
- Peat – a peat of >0.5 m but ≤1.0 m depth and which has an organic matter content of >60%; and
- Deep Peat – a peat that is >1.0 m depth.

6.1.6. The PLHRA: BPG also identifies three different types of peat deposits; raised bog, blanket bog and fen bog. The Wildlife Trust [Wildlife Trust, 2021a] records that a raised bog is formed of deep peat which can be several metres higher than the surrounding ground level and covered with a surface layer of vegetation. Generally, raised bogs are significantly wetter than the surrounding land and are fed almost entirely by rainwater. The Wildlife Trust [Wildlife Trust, 2024b] records that a blanket bog is generally an upland habitat with peat that has accumulated to a depth of at least 0.5 m, typically on flat or gently sloping land where drainage is poor, and the peat is predominately fed by rainwater. The International Peat Society [International Peat Society, 2021] records fen peatlands as being in depressions which have strong connections with groundwater that have been in contact with mineral bedrock or soil.

6.1.7. Peat accumulations are typically thickest in reasonably flat lying areas or topographic hollows where surface and groundwater drainage are often concentrated and thins as the local slope angle increases. On steep slopes the conditions are generally considered too steep for thick peat to form, although some peat may be present.

6.2. Factors Controlling Peat Instability

6.2.1. The PLHRA: BPG indicates that peat instability can manifest in a number of ways, which generally fall into two categories: minor instability and major instability. Minor instability are features which may be warning signs of major instability or possibly just simply represent a response to the land against drainage and gravity (e.g. creep). Localised and small tension cracks, tears in the acrotelm, compression ridges or bulges and thrusts in the peat deposits represent some features which represent minor instability. Major instability comprises an actual peat landslide which can vary in form and scale.

6.2.2. The PLHRA: BPG document records that peat instability can be caused by a number of factors which can be split into two groups: preparatory factors and triggering factors. Preparatory factors increase the

susceptibility of peat to become unstable (i.e. fail) without necessarily causing a peat landslide. As such, preparatory factors can influence peat stability over a long period of time. Triggering factors have an immediate or rapid effect on the peat changing its stability from stable to unstable. As such, triggering factors can be considered as being the cause of failure.

6.2.3. The main preparatory factors, which reduce the overall stability of peat include:

- Increase in the mass of peat (e.g. through vertical accumulation of peat, increase in water content and through afforestation within the peat);
- Reduction in shear strength of the peat or substrate through physical changes in its structure (e.g. creep or vertical fracturing), chemical or physical weathering or by clay dispersal in the substrate;
- Loss of surface vegetation (e.g. through burning, pollution or through deforestation) causing reduction in tensile strength;
- Increased buoyancy of the peat through increase in sub-surface water or wetting of desiccated areas; and
- Afforestation, which will reduce the water content of the peat body and increase the likelihood in the formation of desiccation cracks which are likely to be infiltrated by rainfall.

6.2.4. Triggering factors can be split into two types; natural events and man-made. Triggering factors covering the two types include

- Natural Events:
  - High intensity and prolonged rainfall, in particular following a dry period, or melting of snow / ice causing a short-term high pore-water pressure at pre-existing or potential rupture surfaces;
  - Earthquakes causing rapid ground acceleration;
  - Erosion at the toe of a peat slope, reducing support to the upslope peat mass; and
  - Increased loading on the peat mass (e.g. through previous peat landslide debris).
- Man-made Events:
  - Alteration of hydrological regime by changing natural drainage paths;
  - Rapid ground accelerations caused by works (e.g. through blasting or vibrations of plant);
  - Extraction of peat at toe of slope, reducing support to the upslope peat mass;
  - Increased loading on the peat by plant, structures or overburden;
  - Earthworks including excavating, filling, stockpiling and Embankment of material; and
  - Ground subsidence associated with mining.

6.2.5. While peat failures are often considered to originate in thick or extensive accumulations, it should be noted that instability can still occur in areas of limited peat thickness. The nature of the peat and the interface between the separate layers can also influence its stability. The plane of failure can be located at the interface between the upper, periodically saturated acrotelm layer and the underlying permanently saturated catotelm layer. The plane of failure can also be located at the interface between the peat and the underlying substrate.

6.2.6. Failure can occur due to heavy or prolonged rainfall or due to melting snow or ice which can cause short-term high pore-water pressure along pre-existing or potential rupture surface (e.g. between the substrate and the peat) and can increase the mass of the peat accumulation. This can be exacerbated by drying out of the peat (in summer months for example) leading to the formation of desiccation cracks which can in turn fill with water during rainfall resulting in a short-term increase in pore-water pressure and potentially cause failure. The influence of rainfall on potential peat failure is considered to be heavily dependent on the natural drainage regime within the peat. It should be noted that peat failures often occur after heavy rainfall events after the peat slope has been conditioned to fail after other processes. Given the effect of global warming and the anticipated greater frequency of extreme weather conditions, including more intense storms with heavy rainfall, the rainfall trigger of peat instability may be of more significant concern in the future.

6.2.7. Peat extraction can generate new drainage pathways, leading to a concentration of surface and / or groundwater flow and subsequently result in either increased erosion or concentration of water within localised areas of the accumulation, which can potentially increase the instability of the peat mass. Extraction or erosion can also have the effect of releasing the confining pressures acting on the peat, which can lead to the development of tension cracks in adjacent peat accumulations as a result of the loss in lateral support. Extraction or erosion of the peat mass at the toe of a slope also reduces the support to the upslope material which can result in peat slope failure.

6.2.8. Loading of peat causes an increase in the shear stress applied to the peat mass and can also generate the formation of tension cracks through compression and bulging of underlying or adjacent peat soils. In the case where tension cracks are formed, depending on the topography, the strength of the peat may be dramatically reduced and due to the alteration in loading, rainfall may not be required to initiate a failure.

6.2.9. Ground subsidence associated with the collapse of shallow underground workings and / or abandoned mine shafts may trigger localised peat slumps. Peat failures initiated by mining subsidence could be expected to typically involve peat slumping in towards the area affected by subsidence and their scale would be dependent on a number of factors including the depth of the peat deposits, the nature of the local hydrological regime and the topography of the surrounding area.

6.2.10. Rapid ground accelerations caused by either man-made vibrations or earthquakes increases the shear stresses within the peat mass and may trigger a peat landslide.

6.2.11. Tree felling (even where affected areas are subsequently re-planted) and permanent deforestation can impact upon the hydrogeological regime of the peatland area through reduced groundwater extraction and altered drainage pathways. This can lead to increased peat erosion and focused drainage and short-terms high pore-water pressures within pre-existing or potential rupture surfaces in the peat accumulation, both of which can increase the risk of peat failure. Also removal of trees can remove the potentially stabilising root systems, which can reduce the tensile strength of the peat mass.

6.2.12. Alteration of the hydrological regime can have long-term and far reaching effects on the stability of peat accumulations. Alteration by diverting or blocking either man-made or natural surface drainage pathways or the proposed development of new ditches can transport and concentrate water into areas which can cause potential peat instability.

6.2.13. Within peat accumulations, groundwater will generally flow more readily within the upper acrotelm layer relative to the underlying less permeable catotelm. Excavations within peat will influence existing drainage paths and local permeability. The construction of a pumped storage hydro scheme will potentially generate an area of hydrological sensitivity due to the free draining nature of the construction stone.

6.2.14. It should be noted that peat is a natural feature which under the correct conditions will grow. It is likely that, on sloping ground and where the peat has been growing, there will be a time when the stabilising forces (e.g. internal strength of the peat and the interface with the underlying substrate) will be outweighed by the destabilising forces (e.g. weight of the peat mass) and the peat accumulation will fail.

6.3. Peat Failures

6.3.1. Areas that have experienced historic peat instability are more likely to experience future instability issues during construction. It is therefore essential to identify and record any signs of past instability (e.g. cracking of the peat surface, any debris from past failures, peat creep, etc) as part of any peat instability assessment.

6.3.2. Peat failures can occur on gentle slopes just as on steeper slopes, depending on the loading, drainage conditions and the condition of the peat structure. Changes in gradient, including the subsurface gradient of underlying strata, can also contribute to peat failure due to the potential short term excess pore-water pressures they can create within both concave and convex slope profiles and the gravitational effects on the peat mass.

6.3.3. Table 2.1 of the PLHRA: BPG identifies the following different types of peat failures:

- Bog Bursts – failure of a raised bog which involves the emergence of liquid basal peat followed by the settlement of the previously overlying residual peat. Typically recorded to occur on slopes with gradients between 2° and 5° with a typical peat thickness of between 2 and 5 m;

- Bog Flow – failure of a blanket bog which involves the emergence of highly humified (decomposed) basal peat from a clearly defined source followed by the settlement of the previously overlying residual peat. Typically recorded to occur on slopes with gradients between 2° and 5° with a typical peat thickness of between 2 and 5 m;
- Bog Slide – failure of blanket bog involving the sliding of the peat along a shearing surface within the peat mass. Typically recorded to occur on slopes with gradients between 5° and 8° with a typical peat thickness of between 1 and 3 m;
- Peat Slide – failure of blanket bog involving sliding of entire peat mass on a shearing surface at the peat / substrate interface leading to a transitional type failure. Typically estimated to occur on slopes with gradients between 5° and 8° with a typical peat thickness of between 1 and 3 m;
- Peaty Debris Slide – Transitional failure in which the shearing surface is entirely located within the substrate. The covering layer of peat is part of the failure; however, the peat is only considered to be a secondary influence on the failure. Typically recorded to occur on slopes with gradients between 4.55° and 32° with a typical peat thickness of <1.5 m; and
- Peat Flow – any other failure not covered by one of the above, in any other peat deposit (e.g. fen, basin bog, etc) and by any other failure mechanism.

7. Peat Landslide Hazard and Risk Assessment

7.1. General

7.1.1. Peat slides can represent a significant hazard and can occur during the construction, operation and decommissioning phases of a development. The nature of electricity generation developments in Scotland often situates them in areas where peat moorland is typically found, and it is inevitable that some alteration of the local hydrological regime of a site will occur due to the design and construction practices of such a development.

7.1.2. It is widely considered that development in areas of peat accumulation can have an effect on the stability of these soft soils through alteration of the drainage regime, alteration of loadings (both temporary loads during construction and final working loads), alteration of land use (e.g. removal of surface vegetation) and alteration of the topography. Any proposed development within such an area requires a PLHRA to characterise the Proposed Development Site, identify issues and develop the required construction mitigation measures to reduce the risk of a failure occurring within the peat.

7.1.3. The key considerations of this assessment are that:

- Existing, historical or potential areas of instability are identified; and
- The Proposed Development, including construction works, does not result in an unacceptable risk of peat failure.

7.2. Triggering and Preparatory Factors Relevant to the Proposed Development

7.2.1. The following provides a summary of the relevant triggering and preparatory factors which relate to the Proposed Development:

- Rainfall is not a controllable factor. However, the assessment considers the potential effects of heavy rainfall at the Proposed Development Site;
- Peat loading, and peat extraction are potential hazards. However, both can be mitigated through particular working methodologies (to be identified in the site-specific construction methodology documents to be prepared by the Contractor prior to construction);
- The topography of the Proposed Development Site is characterised by relatively elevated and sloping terrain and the assessment should take cognisance of the combined topography and peat thickness;
- The creation of new drainage paths may lead to the potential channelling and ponding of run-off in areas of the Proposed Development Site, posing a potential hazard. This hazard can be minimised through the adoption of particular working methodologies (to be confirmed in site-specific construction methodology documents);
- The creation of rapid ground acceleration through plant and construction methods. This hazard can be reduced through the adoption of particular working methodologies and practices (to be confirmed in site-specific construction methodology documents); and
- The removal of surface vegetation (i.e. through tree felling and vegetation clearance). This hazard can be reduced by minimising the level of felling and clearance to complete the Proposed Development.

7.2.2. Working methodologies / mitigation measures referred to above are discussed further in Section 8 of this report.

7.3. Consequences of Peat Failure

7.3.1. A key part of the risk assessment process is to identify the potential scale of peat failure should it occur and identify the receptors of the consequences. For the Proposed Development Site, the key potential sensitive receptors of peat failure are considered to be the following:

- The Proposed Development (e.g. new substation, new / upgrades to existing access track, damage to existing and temporary overhead lines, underground cable route, etc.);
- Site workers and plant (risk of injury / death or damage to plant);
- Wildlife (disruption or destruction of habitat);
- Watercourses and aquatic fauna;
- Site drainage (blocked drains / ditches leading to localised flooding / erosion); and
- Visual amenity (scarring of landscape).

7.4. Qualitative Risk Assessment

7.4.1. This Preliminary PLHRA consists of a qualitative assessment based on an examination of available topographical maps and aerial photography, a digital terrain model, observations made during site visits, an assessment of peat probing activities, initial GI results and engineering judgement.

7.4.2. The Qualitative Risk Assessment ('Hazard Ranking') was undertaken by identifying the factors that can cause landslide events and estimating the impact of such events on the Proposed Development. The Hazard Ranking has been undertaken in accordance with the PLHRA: BPG.

7.4.3. The Hazard Ranking was calculated using the following equation (Eq. 3 from the PLHRA: BPG):

7.4.4. Hazard Ranking = Hazard x Exposure

7.4.5. The term Hazard is defined in this case as "the likelihood of the peat landslide event occurring." The term Exposure is defined in this case as "the impact and consequences that the event may have" or its "adverse consequences."

7.4.6. The Hazard scale used in this assessment is shown in **Table 6. Peat Landslide Hazard Ranges over the Lifetime of the Proposed Development**, which is based on the scale recommended in Table 5.1 of the PLHRA: BPG.

Table 6. Peat Landslide Hazard Ranges over the Lifetime of the Proposed Development

Scale	Likelihood	Probability of Occurrence
5	Almost certain	> 1 in 3
4	Probable	1 in 10 – 1 in 3
3	Likely	1 in 10^2 – 1 in 10
2	Unlikely	1 in 10^7 – 1 in 10^2
1	Negligible	< 1 in 10^7

7.4.7. The Exposure scale used in this assessment is shown in **Table 7. Peat Landslide Exposure Ranges over the Lifetime of the Proposed Development**, which is based on the scale recommended in Table 5.2 of the PLHRA: BPG.

Table 7. Peat Landslide Exposure Ranges over the Lifetime of the Proposed Development

Scale	Exposure	Impact as % damage to (or loss) of receptor	Example Consequences
5	Extremely high	> 100% of the asset	Loss of life or serious injury, major pollution incident, destruction of property or infrastructure or public road, major loss of habitat.

Scale	Exposure	Impact as % damage to (or loss) of receptor	Example Consequences
4	Very high	10% – 100%	Minor or non-serious injury, minor damage to property or temporary closure of infrastructure, significant pollution incident or significant loss of habitat.
3	High	4% – 10%	Minor pollution incident, destruction of Access Track locally, significant delay to construction, localised loss of habitat.
2	Low	1% – 4%	Temporary closure of forest roads, minor delay to construction.
1	Very low	< 1% of the asset	Minor remediation of infrastructure or habitat.

7.4.8. Once all areas within the Proposed Development Site have been assigned a Peat Landslide Hazard and degree of Exposure, a Hazard Level can be estimated for the Proposed Development. The indicative Hazard Levels used in this assessment are shown in **Table 8. Indicative Hazard Levels**, which is based on the scale recommended in Table 5.3 of the PLHRA: BPG.

Table 8. Indicative Hazard Levels

Peat landslide probability or likelihood	Adverse consequence				
	Extremely High	**Very High**	**High**	**Low**	**Very Low**
Almost Certain	High	High	Moderate	Moderate	Low
Probable	High	Moderate	Moderate	Low	Negligible
Likely	Moderate	Moderate	Low	Low	Negligible
Unlikely	Low	Low	Low	Negligible	Negligible
Negligible	Low	Negligible	Negligible	Negligible	Negligible

7.4.9. Where the Hazard Level for a zone is moderate or high, avoidance or specification of mitigation measures would normally be the only means by which project infrastructure could be considered acceptable within that zone at the Proposed Development Site.

7.4.10. The need for further investigation or specification of mitigation measures should be a function of the risk level present on the Proposed Development Site. The Hazard Levels and suggested actions used in this assessment are shown in **Table 9. Hazard Level and Suggested Actions**, which is based on the scale recommended in Table 5.4 of the PLHRA: BPG.

Table 9. Hazard Level and Suggested Actions

Risk Level	Action suggested for each zone
High	Avoid project development at these locations
Moderate	Project should not proceed unless risk can be avoided or mitigated at these locations, without significant environmental impact, in order to reduce risk ranking to low or negligible.
Low	Project may proceed pending further investigation to refine assessment and mitigate hazard through relocated or re-design at these locations.
Negligible	Project should proceed with monitoring and mitigation of peat landslide hazards at these locations as appropriate.

7.5. Estimating the Hazard

7.5.1. To estimate the level of Hazard, the inputs used have been based on the major factors that can affect slope stability at the Proposed Development Site, namely: slope angle, peat thickness, evidence of peat instability, substrate present, presence of forestry and hydrology. The selection of the ranges for ranking

of these inputs was based on a literature review, site evidence and engineering judgment. A discussion on the rankings chosen for each of the main factors listed is given in the following sections.

Slope Angle

7.5.2. Gravity is the primary driving force of all landslides and as such, slope angle is a significant factor in controlling the stability of peat soils.

7.5.3. Although peat is known to have failed on relatively gentle sloping land, with the majority of failures occurring on ground sloping between 4° and 8°, this is likely to correspond to these slope angles being favourable to significant peat accumulation, and therefore more closely linked to the thickness of peat [Boylan, et al., 2008].

7.5.4. Shallower sloping ground is considered to have a reduced likelihood of failure, since there is less gravitational force to facilitate instability. As such, gentle slopes are not considered to be as susceptible to failure as steeper slopes.

7.5.5. As a result, assigned rankings relating to slope angle vary between 0.5 (where slopes are almost flat) and 5 (where steep slopes are present), as presented in **Table 10. Slope Angle Ranking (Ranking Factor 1)**.

Table 10. Slope Angle Ranking (Ranking Factor 1)

Slope Angle (°)	Ranking
0 – 2	0.5
< 2 – 5	1
< 5 – 10	2
<10 – 15	3
<15 – 20	4
≥ 20	5

7.5.6.

7.5.7. Please refer to **Figure 15.3.4 Topography (Volume 5: Appendices)** for the topography across the Proposed Development Site.

Peat Thickness

7.5.8. Mills, A.J (2002) reports that peat slides most frequently occur in peat accumulations between 0.5 m and 1.5 m in thickness, while bog bursts commonly occur in peat ranging between 1.0 m and 5.0 m in depth. Peat slides are defined as “slab-like, shallow translational failures with a shear failure mechanism operating at, or just below, the peat and underlying substrate interface” [Warburton, et al., 2004]. Bog bursts “involve large quantities of water and peat debris that flows downslope…usually associated with raised bogs” [Mills, 2002] following bursting of peat in a near-liquid state through tears in the surface layers, possibly as a result of a build-up of hydrostatic pressures within the peat.

7.5.9. Peat failure may be facilitated through the development of weak layers within the peat mass which may either form naturally or by ‘hydrological factors’. Peat has a natural anisotropic strength due to the process by which it is formed. In particular, the nature of the interface between the distinct layers within a peat mass is defined by hydrology. These distinct layers are:

- An upper vegetative mat consisting of the living vegetation of herbaceous plants, grasses and mosses;
- The acrotelm, which is the surface layer of an active peat forming mire; and
- The catotelm, which is the lower layer of an active peat forming mire.

7.5.10. It is considered that the nature of the boundary between the acrotelm and catotelm, and between the catotelm and the underlying substrate (e.g. mineral soil, weathered rock) influence the strength of the peat mass [JNCC, 2011].

7.5.11. Peat stratification and thickness are associated with one another. This is due to the fact that thin deposits of peat are unlikely to have a catotelm and may mainly be composed of a vegetative mat and acrotelm.

As such, with inherent strength as a consequence of a more fibrous morphology, peat thicknesses of less than 0.5 m are not reported to fail catastrophically. However, thicker deposits are more likely to contain weaker layers or bands of pseudo fibrous / amorphous peat, which are more likely to fail.

7.5.12. For the purposes of this assessment, peat thickness has been ranked between 0.5 and 4. The ranking increases with depth; increasing values relate to more onerous conditions and reflect the tendency for 'weaker' peat to be present as thickness increases, in addition to the presence of a greater disturbing force as a consequence of the increasing thickness. The ranking adopted for peat thickness is given in **Table 11. Peat Thickness Ranking (Ranking Factor 2)**.

Table 11. Peat Thickness Ranking (Ranking Factor 2)

Peat Thickness (m)	Ranking
≤ 0.5	0.5
>0.5 - 1.0	1
>1.0 - 2.0	2
>2.0 - 3.0	3
> 3.0	4

7.5.13.

7.5.14. Please refer to Figure 15.3.8 Peat Probe Survey Results and Figure 15.3.9 Peat Depth Interpolation Plan (Annex A Figures) for the peat depths across the Proposed Development Site.

Evidence of Peat Instability

7.5.15. Evidence of previous or incipient peat instability may provide an indication that conditions at that location are favourable to peat instability and therefore the area may be prone to further instability. As such, it is considered that areas with evidence of peat instability will have a higher risk of failure than areas where no stability issues have been identified.

7.5.16. For the purposes of this assessment, where no peat instability is identified through the DBA or site visit, a ranking of 0 is applied. Where localised small-scale failures or instability features are identified, a ranking of 1 is used and where more widespread or large-scale failures are identified, a ranking of 2 is applied, as indicated in **Table 12. Signs of Relic Failure Ranking (Ranking Factor 3)**.

Table 12. Signs of Relic Failure Ranking (Ranking Factor 3)

Signs of Relic Failure in Vicinity	Ranking
Absent	0
Localised evidence of instability	1
Widespread evidence of instability	2

7.5.17.

Substrate

7.5.18. As noted in the Peat thickness section above, it is considered that the nature of the boundary between the acrotelm and catotelm, and between the catotelm and the underlying substrate (e.g. mineral soil, weathered rock) influence the strength of the peat mass. The nature of the substrate can therefore play a part in the level of stability of a peat mass.

7.5.19. Where fine-grained deposits (e.g. clay or silt) are present at the interface, there is likely to be weathering and softening of the clay due to the peat likely being saturated, with poor or non extent vertical drainage paths. This will result in a reduction of the undrained shear strength or effective shear strength parameters of the fine-grained deposits. This means failure could occur within the peat mass itself, at the interface with the fine-grained deposit or within the fine-grained deposit.

7.5.20. Where coarse-grained deposits (e.g. sand, sand & gravel or gravel) are present at the interface, the effective shear strength parameters are likely to be comparatively high compared to the fine-grained deposits. Where coarse-grained deposits are present failure is likely to occur in the peat mass itself.

7.5.21. Rock provides a high strength substrate, where encountered, however, the rock surface may be smooth and as such can provide a weak interface with the peat. Failure of the peat may therefore occur within the peat mass itself or at the interface with the rock. For the purposes of this preliminary assessment any rock interface has been given a higher risk rating similar to that of the fine-grained interface.

7.5.22. **Table 13. Substrate Ranking (Ranking Factor** 4) presents the ranking for the possible substrates which can be encountered at the Proposed Development Site.

Table 13. Substrate Ranking (Ranking Factor 4)

Substrate	Ranking
Coarse-grained (fine to coarse sand, sand & gravel, Gravel)	1
Fine-grained (silt or clay) & very clayey/silty fine to medium sand	2
Rock	2

7.5.23.

Presence of Forestry

7.5.24. The process of afforestation and subsequent deforestation can have significant effects on the structure and hydrological properties of peat soils, which may in turn result in an increased risk of peat failure.

7.5.25. During the planting operations, a series of drains are generally cut into the peat soil across the area to be afforested. These drains are typically between 0.4m and 0.6m deep and are cut perpendicular to the surface contours to allow drainage of the soils to fall away from the plantation (Wilson & Hegarty, 1993). This process initially affects the structure and hydrology of the upper acrotelmic layer of peat. Drains were noted to have been installed within the forestry in the Proposed Development Site, as described, during the site walkover surveys undertaken.

7.5.26. Over the years and decades following initial planting, drying out and degradation of the peat adjacent to the furrows results in their widening. As the trees mature and their canopies grow, an increase in the capacity of the trees to intercept rainfall and for evapotranspiration to occur, results in further drying of the peat. Dry summers can also exacerbate the drying effects on the peat, with water uptake by root systems replacing drainage as the main cause of peat drying, resulting in the water table falling below the base of the furrows and causing cracking to extend deeper into the catotelmic layer. Eventually, the drying effects can cause the peat to crack, with the cracks typically following the lines of drains / furrows. No cracks were noted within the peat on site during the site walkover surveys, however, the peat surface was typically obscured by vegetation and so cracks may have been present.

7.5.27. As the plantation matures, the peat is subject to progressive loading from the growing trees and the water table generally decreases in level. Over the lifetime of the forest, drainage ditches can become blocked due to the trees shedding their needles / leaves, ground vegetation cover infiltrating them and soils washing into them causing them to ‘silt up’. This can prevent water draining away as intended and can cause a short-term high pore-water pressure build-up following periods of heavy rainfall. During the site walkover surveys, the drainage channels were generally noted to be free from debris. As such, the process of afforestation can have a negative effect on the stability of peat.

7.5.28. Following deforestation, peat loading from the trees is largely removed and there is typically a rise in the water table. However, with the reintroduction of a higher water table level, a short-term increase of pore-water pressure may be established within the peat mass. Deforestation is considered to have a negative effect on peat stability but is considered less of a concern than when recently forested due to the overall reduction of peat loading.

7.5.29. Based on the above discussion, the following ranking for the presence of forestry is considered appropriate, as shown in **Table 14. Presence of Forestry Ranking (Ranking of 5)**.

Table 14. Presence of Forestry Ranking (Ranking of 5)

Presence of Forestry in the Area	Ranking
Absent	0
Recently deforested / afforested	1
Present	2

7.5.30. Please refer to **Figure 15.3.3 Site Walkover Features (Annex A Figures)** for the presence of forestry across the Proposed Development Site.

Hydrology

7.5.31. An increase in pore-water pressures generated by intense rainfall is a significant potential 'triggering mechanism' for peat slides. However, prolonged periods of heavy rainfall are not necessarily related to instability. Both the distribution and intensity of precipitation have a complex influence on the mass movement of peat [Carling, 1986].

7.5.32. In many cases of peat failures, a relatively dry period has been followed by intense rainfall. Although intense rainfall appears to be an important factor, it is important to recognise that the occurrence of an extreme event does not necessarily directly result in peat instability; this being a function of many factors and a combination of climatic preparatory events. For the purpose of this assessment, rainfall has been considered to be a constant for the entire Proposed Development Site.

7.5.33. It has been noted that peat slides have been initiated along natural drainage lines or in association with artificial drainage [JNCC, 2011]. Blocking of existing drainage paths could create a buoyancy effect which may reduce the strength of the peat or cause liquefaction due to raised pore-water pressures at the base of the peat.

7.5.34. Poorly drained areas (such as boggy ground with few / no drainage channels) are considered to be more susceptible to instability due to higher groundwater tables than well-drained areas.

7.5.35. Where drainage ditches become blocked with vegetation for example, water can build up in them allowing pore-water pressures to develop and exceed critical levels during or immediately following intense rainfall.

7.5.36. Generally the site walkover surveys identified that the Proposed Development Site was well drained with a good drainage system in working order, however, locally boggy or saturated ground was also encountered.

7.5.37. The parameter for hydrology has been given a ranking value of between 0.5 and 2 as shown in **Table 15. Hydrology Ranking (Ranking Factor 6)**. Increasing values relate to relatively poor drainage conditions that are considered likely to increase the probability of instability occurring.

Table 15. Hydrology Ranking (Ranking Factor 6)

Hydrology description	Ranking
Well drained with a good drainage system in working order	0.5
Boggy or saturated ground	1
Blocked drainage paths	2

7.5.38. Please refer to **Figure 15.3.7 Hydrology (Annex A Figures)** for the presence of hydrology across the Proposed Development Site.

Weightings

7.5.39. The factors affecting peat instability are not considered to contribute equally and as such, weightings have been applied based on AECOMs understanding of the Proposed Development Site and experience of assessing peat slide risk.

7.5.40. For example, as slope angle is considered to represent one of the main driving forces for peat instability, a weighting of 6 has been assigned to the factor to capture its importance in the mobility of peat. Likewise, evidence of peat instability is considered to be equally influential, as if the conditions in areas have resulted in failures in the past, similar failures could initiate in the future and therefore a weighting of 6 has also been assigned to this factor.

7.5.41. Peat depth is also considered to play a significant role in the stability of peat. As the thickness of peat increases, so does the weight of the peat, which could result in the activation of a slip plane. Also, due to

the anisotropic nature and highly variable structure of peat, the thicker the deposits are, the more likely they are to have a greater number of weaker zones throughout its profile affecting the overall stability of the peat mass. This factor is, however, considered less influential to slope instability than the slope angle and evidence of peat instability and has therefore been given a lower weighting value of 4.

7.5.42. The type of substrate present within the Proposed Development Site can be significant as relates to the peat landslide risk. The presence of fine-grained or rock substrate can mean there is multiple potential failure zones and hence more chance of a peat landslide. The peat thickness can play an important role as to the increased risk of peat instability depending on the substrate present. This factor is, however, considered less influential than peat thickness and has therefore been given a lower weighting value of 3.

7.5.43. Forestry plays a significant role on the peat stability within the Proposed Development Site due to its extensive coverage. The planting process will likely have caused damage to the structure of the upper peat layer, additional loading on the peat from the weight of the trees and degradation of the peat by their drying out all of which can result in an increased risk of peat instability. However, this is not considered to be as significant a factor as peat thickness, slope angle and evidence of peat instability and has therefore been assigned a weighting value of 3.

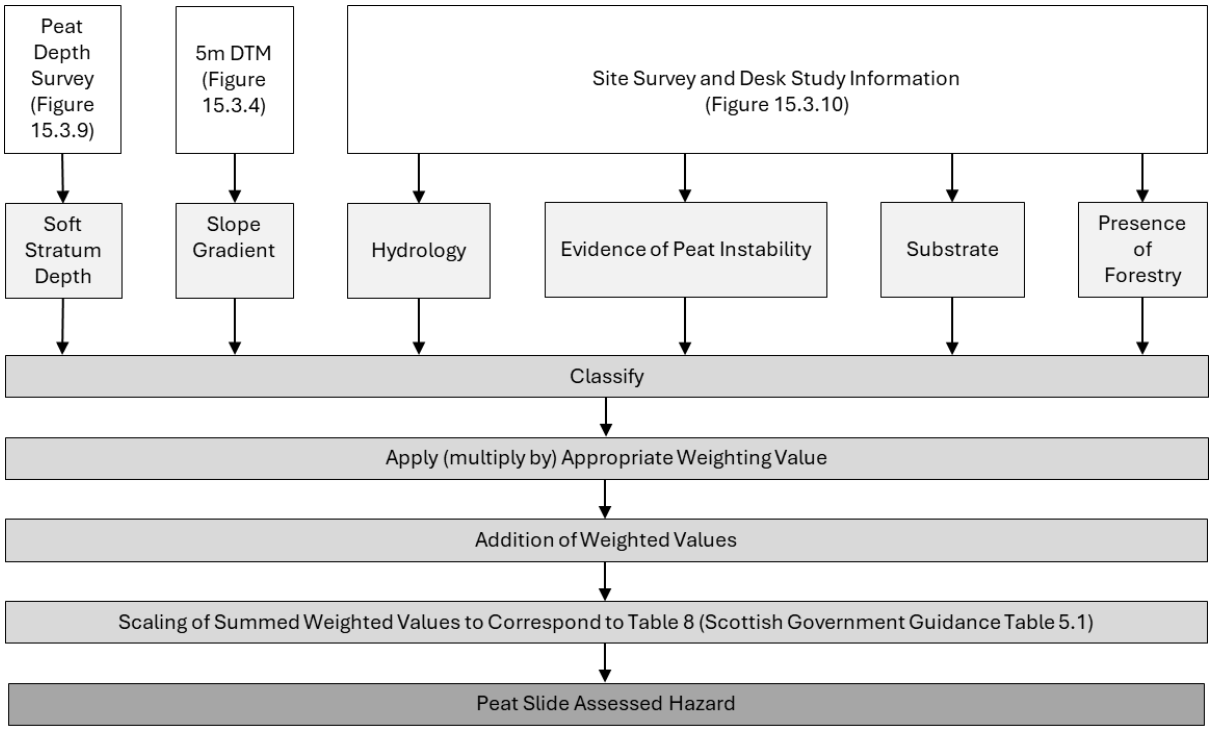
7.5.44. Finally, the hydrology of the peat is also considered to contribute to its stability. However, due to the extent of the forestry across the Proposed Development Site, hydrology is considered to be less influential. This is because the hydrology is closely related to the drainage network throughout the forestry and this factor is therefore linked to and largely covered under the weighting applied to the forestry. However, it is still important to consider this factor, and as such it has been assigned a weighting value of 2.

7.5.45. The weightings assigned to each of the parameters are summarised in **Table 16. Weighting Values for Each Parameter**.

Table 16. Weighting Values for Each Parameter

Layer	Ranking Factor	Weighting
Slope Angle	1	6
Peat Thickness	2	4
Signs of Relic Failure	3	6
Substrate	4	3
Forestry	5	3
Hydrology	6	2

7.5.46. To estimate the level of hazard across the Proposed Development Site and produce the Peat Slide Assessed Hazard plan, the classification and weighting was carried out in Geographic Information Systems software using a multi-criteria analysis. The processed used is illustrated in **Insert 2 Geographic Information Systems Multi-Criteria Analysis**.



Insert 2 Geographic Information Systems Multi-Criteria Analysis

Blasting

7.5.47. Blasting is being considered as part of the Proposed Development to allow construction of parts of the infrastructure that will require significant rock cut. Considering the proposed above ground works, blasting is likely to be considered to construct Tunnel Portals, the UCW and the BP Search Area.

7.5.48. Blasting will increase the probability of a peat landslide through initiation of ground accelerations through the peat which could cause the structure to destabilise. Estimating the effects blasting can have on the structure of the peat and its risk in relation to stability is complex. As such, for the purposes of this preliminary assessment, it is considered where blasting may be undertaken, this will increase the peat slide hazard in that area by a ranking factor of one, e.g. 'unlikely' would become 'likely'. A more detailed assessment would then be undertaken as part of the Final PLHRA undertaken post-consent following GI, design maturity and further understanding of the blasting that may be required.

7.5.49. Blasting is not taken into account as part of the Geographic Information Systems Multi-criteria Analysis described above. Instead, the increase in peat slide hazard will be assigned as part of the assessment. The effect of the blasting will only be considered as part of the assessment on the actual infrastructure to which it is being considered, e.g. on Tunnel Portals assessment, and not on the assessment of the proposed Access Track which is in the vicinity.

7.5.50. The scaling of the Weighted Totals corresponds to **Table 6. Peat Landslide Hazard Ranges over the Lifetime of the Proposed Development** (and Table 5.1 of the PLHRA: BPG) and is shown in **Table 17. Weighted Total vs Scale**.

Table 17. Weighted Total vs Scale

Weighted Total	Scale	Likelihood	Probability of Occurrence
> 50	5	Almost certain	> 1 in 3
41 – 50	4	Probable	1 in 10 – 1 in 3
31 – 40	3	Likely	1 in 10^2 – 1 in 10

Weighted Total	Scale	Likelihood	Probability of Occurrence
21 – 30	2	Unlikely	1 in 10^7 – 1 in 10^2
< 20	1	Negligible	< 1 in 10^7

7.6. Peat Slide Assessed Hazard Plan

7.6.1. The Assessed Potential Peat Slide Hazard is presented in **Figure 15.3.10 Peat Slide Assessed Hazard (Annex A Figures)** and indicates that the potential hazard across the Proposed Development Site is generally assessed to be 'Negligible' (1) or 'Unlikely' (2) with only minor areas assessed as being 'Likely' (3) .

7.6.2. The majority of the proposed infrastructure, including the main GIS Switchyard and compound area, is located in areas assessed as 'Negligible' or 'Unlikely' potential peat slide Hazard. Small local areas of "Likely" peat slide Hazard are noted in the vicinity of the proposed Access Track to the west, proposed temporary overhead line diversion to the north and south of the proposed GIS Switchyard platform area.

7.6.3. Following assessment of the potential peat slide Hazard, the potential impact and the consequences (i.e. Exposure) of a peat landslide has been assessed for both environmental exposure and infrastructure exposure.

7.6.4. The Exposure of a peat slide to the environmental receptors (e.g. watercourses, designated sites, ecologically important areas, etc) is based on the likely environmental impact resulting from a peat slide.

7.6.5. When considering the potential impact of a peat failure, the presence of any existing structures or infrastructure (e.g. forestry tracks etc.), future development (i.e. proposed infrastructure) and / or sensitive receptors (e.g. watercourses, designated sites, etc.) are taken into account.

7.6.6. When considering the baseline condition (i.e. the Proposed Development Site prior to construction), where no receptors are present, the impact is typically considered to be 'very low' (i.e. Exposure rating of 1). Where existing forestry tracks are present and no change is proposed along these, an impact of 'very low' is also considered sufficient, due to the potential impact as a percentage of the total project cost is likely to be less than 1% (i.e. Exposure rating of 1). Where infrastructure is located within 50 m of a watercourse, the impact is rated at 'high' (i.e. Exposure rating of 3 – minor pollution incident may occur).

7.6.7. When considering the potential impact, a peat failure during construction could have on the Proposed Development, the following was taken into account. Generally, where Access Tracks, compounds, underground cabling (trenched) and drainage systems are proposed, the impact is considered to be 'very low' or 'low' (i.e. Exposure rating of 1 or 2 – e.g. minor remediation of infrastructure or temporary closure of access roads, minor delay to construction). At the location of the proposed Tunnel Portals and GIS switchyard an impact of 'high' is considered appropriate due to the increased impact on the cost of the Proposed Development (Exposure rating of 3 – i.e. significant delay to construction and increase in total cost).

7.6.8. Due to the nature of Pumped Storage Hydro, a major part of the works is underground excavations and tunnelling. The underground works are considered to have a negligeable effect on peat landslide and will only be assessed where the Tunnels interact with the ground surface.

7.6.9. For the Embankment works it is assumed that the surface at the base of the Embankments will be stripped from Peat down to the rock and therefore the Peat Landslide Risks associated with that part of the works are negligeable. **Table 18. Qualitative Assessment of Peat Landslide Hazard, Exposure and Hazard Ranking** presents the qualitative assessment undertaken for the Proposed Development Site in a tabular format for each individual infrastructure component. The assessment cross references information set out in this Preliminary PLHRA as follows:

- Column 2 is to be cross-referenced with **Table 6. Peat Landslide Hazard Ranges over the Lifetime of the Proposed Development** and refers to the peat slide Hazard value assigned to the infrastructure component (see **Figure 15.3.10 Peat Slide Assessed Hazard (Annex A Figures)**). The peat slide Hazard may be assessed to be reduced during the evaluation process based on engineering judgement. Where any reduction has taken place this will be discussed in the text within the table. It should be noted that the peat slide assessed Hazard includes a 50 m buffer around each

infrastructure component, as within this buffer zone is where it is considered the Proposed Development is most likely to affect the peat stability.

- Column 3 presents the Assessed Exposure (see **Table 7. Peat Landslide Exposure Ranges over the Lifetime of the Proposed Development**) relating to the individual proposed infrastructure components and any existing infrastructure (i.e. existing forestry tracks).
- Column 4 presents the assessed Exposure (see **Table 7. Peat Landslide Exposure Ranges over the Lifetime of the Proposed Development**) relating to the environmental receptors.
- Column 5 is to be cross-referenced with **Table 8. Indicative Hazard Levels** and **Table 9. Hazard Level and Suggested Actions**, and gives the worst-case Hazard Ranking (i.e. Hazard Ranking = Hazard Scale x Exposure Scale), whereby the value given in Column 2 (the Hazard) is multiplied by the higher value of the two Exposure ratings given in Columns 3 and 4 and expressed as a number.
- Column 6 expresses the worst-case Hazard Ranking value as one of the four terms, which are shown in **Table 9. Hazard Level and Suggested Actions**. When considering the worst-case Hazard this is considering what the worst-case combination of peat slide assess Hazard and infrastructure/environmental Exposure is. i.e. the worst-case peat slide Hazard may not interact with the worst-case infrastructure/environmental Exposure, and so the score chosen rationalises what the realistic worst-case combination between the two inputs would be.

7.7. Infrastructure Locations for Hazard Assessment

7.7.1. To most accurately assess the Peat Landslide Hazard Risk, the Proposed Development Site has been split up into three sections: 1) Access Tracks, 2) Compounds (Temporary and Permanent) and 3) Headpond and assessed individually.

7.7.2. As the access track network is extensive, the tracks were split into seven different sections as shown in **Figure 15.3.11 Access Track Sections (Annex A Figures)**. The different areas are as follows:

- Section 1 – Balnain – River Coiltie
  - Existing Forestry and Land Scotland (FLS) access track from Balnain (A831) to the River Coiltie, terminating at the entrance to the Balmacaan Estate.
- Section 2 – River Coiltie – Permanent Compound (PC) 08 (Tunnel Portal 2)
  - Section of New Access Track from the entrance to the Balmacaan Estate to south of PC08 (Tunnel Portal 2). Includes access to the Temporary Workers Accommodation.
- Section 3 – PC08 – Main Track Split
  - Section of New Access Track from south of Tunnel Portal 02 to the point where the main track splits into two.
- Section 4 – Main Track Split – North of Headpond
  - Section of New Access Track from the main track split to the north of the Headpond.
- Section 5 – Main Track Split – Saddle Dam 2 / Spillway Track
  - Section of New Access Track from the main track split to Saddle Dam 2 / the Spillway. Includes temporary access to the Headpond Basin around Saddle Dam 2.
- Section 6 – North of Headpond – Main Dam / Saddle Dam 1/Spillway and UCW
  - Section of New Access Track from the north of the Headpond to the Main Dam, Saddle Dam 1, the Spillway and the UCW. Includes temporary access within the Headpond basin.
- Section 7 – Existing Alltsigh Track – Valve House
  - Section of New Access Track from the existing Alltsigh Track to the Valve House on the toe of the Main Dam.
  - The existing access track as shown on **Figure 15.3.11 Access Track Sections (Annex A Figures)** from Alltsigh has not been assessed as part of this Preliminary PLHRA as minimal peat depth and extent information is available for the majority of the route. This will be assessed as part of the Final PLHRA, post-consent, following further investigation works along the route.

Table 18. Qualitative Assessment of Peat Landslide Hazard, Exposure and Hazard Ranking

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Area	Assessed Hazard (Worst Case)	Assessed Infrastructure Exposure	Assessed Environmental Exposure	Worst-Case Hazard Ranking	Worst-Case Hazard Ranking	Comment
See **Figure 15.3.10 Peat Slide Assessed Hazard (Annex A Figures)** for reference of infrastructure locations and assessed peat slide Hazard						
Section 1 – Balnain – River Coiltie	4 (2)	2 (3)	3	12 (8)	Moderate	Areas of 'probable' peat slide hazard underlying and within 50 m of the proposed Access Track. The proposed Access Track follows the alignment of an existing Access Track, with other small Access Tracks in the vicinity and spurring off. No other proposed or existing infrastructure are present in the vicinity of the Access Track section. The infrastructure exposure is therefore rated as 'low' as this Access Track section is the only one leading to the northern and eastern sides of the proposed Headpond. The A831 is located at the northern extent of the Access Track section and any landslide here would result in a high exposure. However, only 'unlikely' peat slide hazard is encountered within the vicinity of the A831, hence the worst case 'probable' peat slide hazard would not interact with the worst-case infrastructure exposure. For the purposes of the assessment the lower exposure of 'low' has been used as this interacts with the higher peat slide hazard. No environmentally significant designation recorded within or in close vicinity to the proposed Access Track. However, watercourses are crossed and located within 50 m of the Access Track section and 'probable' peat slide hazard. The assessed environmental exposure is therefore rated at 'high'. **The resulting worst-case Hazard ranking is considered 'moderate'**
Section 2 – River Coiltie – PC08	3	3	3	9	Low	Areas of 'likely' peat slide hazard underlying and within 50 m of the proposed Access Track. Track mostly in 'unlikely' peat slide hazard areas. No existing infrastructure is present along the proposed Access Track section, except for at the northern extent. There are multiple proposed compounds within the vicinity of the track as well as permanent structures such as Tunnel Portals (PC07 & PC08) and the location of the GIS Switchyard (PC04). Given the presence of the Tunnel Portals and as these would interact with the 'likely' peat slide hazard, a worst-case infrastructure of 'high' has been applied. No environmentally significant designation recorded within or in close vicinity to the proposed Access Track. However, watercourses are crossed and located within 50 m of the Access Track section and 'likely' peat slide hazard. The assessed environmental exposure is therefore rated at 'high'. **The resulting worst-case Hazard ranking is considered 'low'**
Section 3 – PC08 – Main Track Split	3	2	3	9	Low	Areas of 'likely' peat slide hazard underlying and within 50 m of the proposed Access Track. Track mostly in 'unlikely' peat slide hazard areas. No existing infrastructure is present along the proposed Access Track section. Along with the proposed access track, two Temporary Compounds and a Tunnel Portal (PC08) are located along the Access Track section. The Tunnel Portal would typically result in a 'high' exposure, however, this has already been covered in Access Track Section 3 and therefore won't be covered again for this section. Therefore the worst-case hazard ranking relates to the Access Track section itself as it's the only track leading to the northern and eastern side of the Headpond. As such, an infrastructure ranking of 'low' has been applied. No environmentally significant designation recorded within or in close vicinity to the proposed Access Track. However, watercourses are crossed and located within 50 m of the Access Track section and 'likely' peat slide hazard. The assessed environmental exposure is therefore rated at 'high'. **The resulting worst-case Hazard ranking is considered 'low'**
Section 4 – Main Track Split – North of Headpond	3 (2)	2	2 (3)	6	Low	Areas of 'likely' peat slide hazard underlying and within 50 m of the proposed Access Track. Track mostly in 'unlikely' peat slide hazard areas. No existing infrastructure is present along the proposed Access Track section. Along with the proposed Access Track, a Temporary Compound is located along the Access Track section. Therefore 'the worst-case hazard ranking relates to the Access Track section itself. As such, an infrastructure ranking of 'low' has been applied.

Column 1 Area	Column 2 Assessed Hazard (Worst Case)	Column 3 Assessed Infrastructure Exposure	Column 4 Assessed Environmental Exposure	Column 5 Worst-Case Hazard Ranking	Column 6 Worst-Case Hazard Ranking	Column 7 Comment
						No environmentally significant designation recorded within or in close vicinity to the proposed Access Track. However, watercourses are crossed and located within 50 m of the Access Track section. No areas of 'likely' peat slide hazard along the Access Track section are within 50 m of watercourses. The environmental exposure has therefore been reduced to 'low'. The 'unlikely' peat slide hazard along the access track section does interact with the watercourses within 50 m, and so would have an environmental exposure of 'high' as shown in the rankings given in the brackets. **The resulting worst-case Hazard ranking is considered 'low'**
Section 5 – Main Track Split – Saddle Dam 2 / Spillway Track	4 (3)	2 (3)	3	12 (9)	Moderate	Areas of 'probable' and 'likely' peat slide hazard underlying and within 50 m of the proposed Access Track mostly in 'unlikely' peat slide hazard areas. No existing infrastructure is present along the proposed Access Track section. Along with the proposed Access Track, a Temporary Compound, a Tunnel Portal (PC15) and a ventilation shaft (PC14) are also located along the Access Track section. Also at the southern extent of the Access Track section are the Saddle Dam 2 and the Spillway. Although the Saddle Dam 2 and Spillway are significant structures, given their scale and mass the infrastructure exposure of these are considered to be 'low'. The worst-case infrastructure exposure relates to the Tunnel Portal (PC15) with this considered to have an exposure of 'high'. However, the Tunnel Portal does not interact with any area of 'probable' peat landslide with only 'likely' peat slide hazard being estimated in the vicinity. This is shown in the assessment within the brackets. The ventilation shaft is also considered to have an exposure rating of 'high', however, the highest peat landslide hazard to interact with this is 'unlikely. The worst-case infrastructure exposure that would interact with the 'probable' peat slide hazard is the proposed access track itself and the Saddle Dam 2 and Spillway. No environmentally significant designation recorded within or in close vicinity to the proposed Access Track. However, watercourses are crossed and located within 50 m of the Access Track section. The areas of 'probable' peat slide along the Access Track section do interact with the watercourses within 50 m, and so would have an environmental exposure of 'high'. **The resulting Hazard ranking is considered 'moderate'**
Section 6 – North of Headpond – Main Dam / Saddle Dam 1 and UCW	4 (2)	2	2 (3)	8 (6)	Low	Areas of 'likely' peat slide hazard underlying and within 50 m of the proposed Access Track. Track mostly in 'unlikely' peat slide hazard areas. No existing infrastructure is present along the proposed Access Track section. Along with the proposed Access Track, the Main Dam, BP Search Area and UCW are present along the Access Track section. Although the Main Dam is a significant structure, given its scale and mass the infrastructure exposure of this is considered to be 'low'. As the UCW will be constructed after the Access Track and will have all peat stripped within resulting in a very small interface with the Access Track where peat is present, the exposure as a result of the Access Track on the UCW is considered to be 'very low'. The BP Search Area is considered with an exposure of 'very low'. Therefore the worst-case infrastructure exposure is the proposed Access Track itself and the Main Dam both of which have an exposure of 'low', with only the proposed Access Track interacting with the 'probable' peat slide hazard. No environmentally significant designation recorded within or in close vicinity to the proposed Access Track. However, watercourses are crossed and located within 50 m of the Access Track section. The areas of 'probable' peat slide hazard along the Access Track section are not within 50 m of a watercourse, however, may runout into a watercourse at greater distances. This has resulted in a reduction in the exposure to 'low'. The peat slide hazard that would interact with the 'high' watercourse exposure is 'unlikely', as shown in the rankings in brackets.. **The resulting Hazard ranking is considered 'low'**
Section 7 – Existing Alltsigh Track – Valve House	2	2	3	6	low	Very small isolated areas of 'likely' peat slide hazard are shown within 50 m of the Access Track section, however, given their size, these are not considered to be representative and have therefore been neglected. The worst-case peat slide hazard within 50 m of the Access Track section is therefore considered to be 'unlikely'. An existing Access Track is present in the western extent of the Access Track section, although the exposure for this would be considered to be 'very low'. Along with the proposed Access Track, the Valve House is located at its eastern extent along with the Main Dam. Although the Main Dam is a significant structure, given its scale and mass the infrastructure exposure of this is considered to be 'low'. The worst-case infrastructure exposure relates to the Valve House and proposed Access Track with an exposure of 'low' applied.

Column 1 Area	Column 2 Assessed Hazard (Worst Case)	Column 3 Assessed Infrastructure Exposure	Column 4 Assessed Environmental Exposure	Column 5 Worst-Case Hazard Ranking	Column 6 Worst-Case Hazard Ranking	Column 7 Comment
						No environmentally significant designation recorded within or in close vicinity to the proposed Access Track. However, watercourses are crossed and located within 50 m of the Access Track section and 'unlikely' peat slide hazard. The assessed environmental exposure is therefore rated at 'high'. **The resulting Hazard ranking is considered 'low'**
Temporary Compound (TC) 01	3	2	2	6	Low	TC01 is generally located in an area of 'unlikely' peat slide hazard', however areas of 'likely' peat slide hazard are located within 50 m. The infrastructure exposure for TC01 itself is 'very low'. Therefore the worst-case infrastructure exposure relates to the proposed Access Track to the north which has a ranking of 'low'. No environmentally significant designation recorded within or in close vicinity to the proposed TC01 and no watercourses located within 50 m. However, watercourses are located within 200 m downslope of TC01. As such, an exposure of 'low' is considered suitable. **The resulting Hazard ranking is considered 'low'**
TC02	2	2	2	4	Negligible	TC02 is located in an area of 'negligible' and 'unlikely' peat slide hazard. The infrastructure exposure for TC02 itself is 'very low'. Therefore the worst-case infrastructure exposure relates to the proposed Access Track to the north which has a ranking of 'low'. No environmentally significant designation recorded within or in close vicinity to the proposed TC02 and no watercourses located within 50 m. However, watercourses are located within 200 m downslope of TC02. As such, an exposure of 'low' is considered suitable. **The resulting Hazard ranking is considered 'negligible'**
TC03	2	2	2	4	Negligible	TC03 is located in an area of 'negligible peat slide hazard', though there are areas of 'unlikely' hazard within 50m of the proposed location. The infrastructure exposure for TC03 itself is 'very low'. Therefore the worst-case infrastructure exposure relates to the proposed Access Track to the south which has a ranking of 'low'. No environmentally significant designation recorded within or in close vicinity to the proposed TC03. A watercourse is located just within 50 m of TC03, however, this is upslope and so unlikely to be affected by any landslide caused by TC03. As such, the greatest exposure is considered to be associated with the watercourse downslope of TC03 outwith 50 m but within 200 m. An environmental exposure of 'low' has therefore been applied. **The resulting Hazard ranking is considered 'negligible'**
PC04 - Switchyard	3 (2)	1 (3)	3	9 (6)	low	PC04 Switchyard compound is located in areas of 'unlikely' peat slide hazard, though there are areas of 'likely' peat slide hazard within 50 m of the proposed location. Access Track section 2 and TC05 are located in the vicinity of PC04, although the worst-case infrastructure exposure is for PC04 itself with a 'high' ranking assigned for that. However, the worst-case peat slide hazard of 'likely' does not interact with PC04 as typically the areas are downslope of PC04 and the very small isolated area upslope has been neglected due to its size and it not considered representative of the general peat mass. As such, the worst-case peat slide that would interact with PC04 itself is assessed as 'unlikely' as shown in the rankings in brackets. In relation to the infrastructure exposure interacting with the 'likely' peat slide hazard this has been reduced to the lowest of 'very low' as none should be affected. No environmentally significant designation recorded within or in close vicinity to the proposed PC04. A watercourse is located around 50 m downslope from PC04 and within 50 m of the 'likely' peat slide hazard. As such, an environmental exposure of 'low' has been applied. **The resulting Hazard ranking is considered 'low'**
TC05 – Workers Accommodation	3	4	3	12	moderate	TC05 is mostly located in an area of 'unlikely' peat slide hazard, though there are areas of 'likely' peat slide hazard within 50 m of the area proposed also. Access Track section 2, PC04 and TC06 are all located in the vicinity of TC05. Given the significance of TC05 being the Temporary Workers Accommodation, this is considered to represent the worst-case exposure with a ranking if 'very high' applied.

Column 1 Area	Column 2 Assessed Hazard (Worst Case)	Column 3 Assessed Infrastructure Exposure	Column 4 Assessed Environmental Exposure	Column 5 Worst-Case Hazard Ranking	Column 6 Worst-Case Hazard Ranking	Column 7 Comment
						No environmentally significant designation recorded within or in close vicinity to the proposed TC05. Watercourses are located within and around 50 m downslope from TC05 and within 50 m of the 'likely' peat slide hazard. As such, an environmental exposure of 'low' has been applied. **The resulting Hazard ranking is considered 'moderate'**
TC06 – Firefighting Compound	2	3	3	6	Low	TC06 is located in an area of 'negligible' and 'unlikely' peat slide hazard'. Access Track section 2 and TC05 are all located in the vicinity of TC06. Although TC05 would have a higher exposure, given this is immediately to the south and upslope and would have peat stripped or controlled as part of its construction, the worst-case infrastructure exposure is considered to be the TC06 itself. Given the significance of TC06 being housing the temporary firefighting compound, the exposure is considered to be 'high'. No environmentally significant designation recorded within or in close vicinity to the proposed TC06. A watercourse is located around 50 m downslope from TC06. As such, an environmental exposure of 'low' has been applied. **The resulting Hazard ranking is considered 'low'**
PC07 - Tunnel Portal 1	4	3	2	12	Moderate	PC07 is located within an area of 'likely' peat slide hazard. Blasting may be undertaken to construct the Tunnel Portal and as such the peat slide hazard has been increased by a ranking of one to 'probable'. Access Track section 2 and PC08 are both located in the vicinity of PC07. Given the presence of the Tunnel Portals and as these would interact with the 'probable' peat slide hazard, a worst-case infrastructure exposure of 'high' has been applied. No environmentally significant designation recorded within or in close vicinity to PC07 and no watercourse located within 50 m. Watercourses are located downslope, however, and as such the environmental exposure is rated at 'low'. **The resulting hazard ranking is 'moderate'**
PC08 – Tunnel Portal 2	4	3	2	12	Moderate	PC08 is located within an area of 'unlikely' peat slide hazard with some 'likely' peat slide hazard areas within 50 m. Blasting may be undertaken to construct the Tunnel Portal and as such the peat slide hazard has been increased by a ranking of one to 'probable'. Access Track section 2 and PC07 are both located in the vicinity of PC08. Given the presence of the Tunnel Portals and as these would interact with the 'probable' peat slide hazard, a worst-case infrastructure of 'high' has been applied. No environmentally significant designation recorded within or in close vicinity to PC08 and no watercourse located within 50 m. A watercourse is located downslope within the vicinity of PC08, however, and as such the environmental exposure is rated at 'low'. **The resulting hazard ranking is 'moderate'**
TC09 – Satellite Compound	3 (2)	1 (2)	2	6 (4)	low	TC09 is located in an area of 'negligible' and 'unlikely' peat slide hazard', although there is an area of 'likely' hazard within 50 m of the compound to the east. Access Track section 3 is located adjacent to TC09. The Access Track would give the worst case exposure of 'low', however, the likely hazard would not interact with this or TC09 itself as is located downslope. Therefore the infrastructure exposure that would interact with the 'likely' peat slide hazard has been reduced to the lowest, 'very low', as it should not affect any infrastructure. 'Unlikely' peat slide hazard would interact with worst-case infrastructure exposure as shown with the rankings in the brackets. No environmentally significant designation recorded within or in close vicinity to TC09 and no watercourse located within 50 m. A watercourse is located downslope within the vicinity of TC09, however, and as such the environmental exposure is rated at 'low'. **The resulting Hazard ranking is considered 'low'.**
TC10 – Satellite Compound	2	2	2	4	Negligible	TC10 is located in an area of 'unlikely' peat slide hazard.

Column 1 Area	Column 2 Assessed Hazard (Worst Case)	Column 3 Assessed Infrastructure Exposure	Column 4 Assessed Environmental Exposure	Column 5 Worst-Case Hazard Ranking	Column 6 Worst-Case Hazard Ranking	Column 7 Comment
						Access Track section 3 is located adjacent to TC10. The Access Track gives the worst case exposure of 'low', with TC10 assumed to have an exposure or 'very low'. No environmentally significant designation recorded within or in close vicinity to TC10 and no watercourse located within 50 m. Watercourses are located downslope within the vicinity of TC10, however, and as such the environmental exposure is rated at 'low'. **The resulting Hazard ranking is considered 'negligible'.**
TC11 – Satellite Compound	3	2	1	6	Low	TC11 is located in an area of 'negligible' and 'unlikely' peat slide hazard, though there is and area of 'likely' hazard within 50 m of the proposed location to the east. A very small isolated area of 'probable' peat slide hazard is recorded within 50 m of TC11 to the east, however, given its size and the surrounding hazard is not considered representative. Access Track section 4 is located adjacent to TC11. The Access Track gives the worst case exposure of 'low', with TC11 assumed to have an exposure or 'very low'. No environmentally significant designation recorded within or in close vicinity to TC11 and no watercourse located within 50 m. No watercourses are located downslope within the vicinity of TC11 either and as such the environmental exposure is rated at 'very low'. **The resulting Hazard ranking is considered 'low'.**
PC12 – Valve House	2	2	3	6	Low	PC12 is located in an area of 'negligible' and 'unlikely' peat slide hazard. Access Track section 7 and the Main Dam is located adjacent to PC12. Although the Main Dam is a significant structure, given its scale and mass the infrastructure exposure of this is considered to be 'low'. Both the Valve House and Access Track are also considered to have an exposure of 'low'.. No environmentally significant designation recorded within or in close vicinity to PC12, however, a watercourse is located downslope within 50 m. Therefore an environmental exposure of 'high' is applied. **The resulting hazard racking is considered 'low'.**
PC14 – Ventilation compound	2	3	2	6	Low	PC14 is located in an area of 'negligible' peat slide hazard. The ventilation shaft comes out the ground and occupies a small area. Access Track section 5 is located in the vicinity of PC14. PC14 is considered to have the worst-case exposure rating of 'high'. The Access Track would have an exposure of 'low' and TC17 an exposure of 'very low'. No environmentally significant designation recorded within or in close vicinity to PC14 and no watercourse located within 50 m. However, watercourses are located downslope within the vicinity of PC14. Therefore an environmental exposure of 'low' is applied. **The resulting hazard racking is considered 'low'.**
PC15 – Tunnel portal 3	4	3	2	9	Moderate	PC15 is located in an area of 'unlikely' peat slide hazard, although areas of 'likely' hazard are also shown within 50 m. Blasting may be undertaken to construct the Tunnel Portal and as such the peat slide hazard has been increased by a ranking of one to 'probable'. Access Track section 5 is located adjacent to PC15. Given the presence of the Tunnel Portal and as these would interact with the 'probable' peat slide hazard, a worst-case infrastructure of 'high' has been applied. No environmentally significant designation recorded within or in close vicinity to PC15 and no watercourse located within 50 m. However, watercourses are located downslope within the vicinity of PC15. Therefore an environmental exposure of 'low' is applied. **The resulting hazard racking is considered 'moderate'.**
TC17 – Pressure shaft compound	1	2	2	2	negligible	TC17 is located in an area of 'negligible' peat slide hazard.

Column 1 Area	Column 2 Assessed Hazard (Worst Case)	Column 3 Assessed Infrastructure Exposure	Column 4 Assessed Environmental Exposure	Column 5 Worst-Case Hazard Ranking	Column 6 Worst-Case Hazard Ranking	Column 7 Comment
						Access Track section 5 is located adjacent to TC17. TC17 and is considered to have a 'very low' exposure and as such the worst-case exposure relates to the access track with a ranking of 'low' applied. No environmentally significant designation recorded within or in close vicinity to TC17 and no watercourse located within 50 m. However, watercourses and waterbodies are located downslope within the vicinity of TC17. Therefore an environmental exposure of 'low' is applied. **The resulting hazard racking is considered 'negligible'.**
Headpond Works – Saddle Dam 1	4 (2)	2	2	8	Low	The area around Saddle Dam 1 would be stripped of peat to competent rock for the construction of the dam therefore the peat slide risk within the footprint would be removed. Outwith the dam footprint but within 50 m, the worst-case peat slide hazard is 'probable', located in the western extent. Typically however, Saddle Dam 1 is located in an area of 'unlikely' peat slide hazard. In the vicinity of Saddle Dam 1 is Access Track section 6. Although Saddle Dam 1 is a significant structure, given its scale and mass the infrastructure exposure of this is considered to be 'low'. The Access Track is also considered with an exposure of 'low'. No environmentally significant designation recorded within or in close vicinity to Saddle Dam 1 and no watercourse located within 50 m. However, watercourses and waterbodies are located downslope within the vicinity of Saddle Dam 1. Therefore an environmental exposure of 'low' is applied. **The resulting hazard racking is considered 'low'.**
Headpond Works – Saddle Dam 2	3 (4)	2	3 (2)	9 (8)	Low	The area around the dam would be stripped of peat to competent rock for the construction of Saddle Dam 2 therefore the peat slide risk within the footprint would be removed. Outwith the dam footprint but within 50 m, the worst-case peat slide hazard is 'probable'. Typically however Saddle Dam 2 is located in an area of 'unlikely' peat slide hazard with 'likely' areas present within 50 m. In the vicinity of Saddle Dam 2 is Access Track section 5. Although the dam is a significant structure, given its scale and mass the infrastructure exposure of this is considered to be 'low'. The Access Track is also considered with an exposure of 'low'. No environmentally significant designation recorded within or in close vicinity to Saddle Dam 2, however, a watercourse is located within 50 m downslope. The areas of 'probable' peat slide to the west of the dam are not considered to interact with the watercourse as a peat slide caused from these would be blocked by the Access Track section and dam. To the east of Saddle Dam 2, the areas of probable peat slide within 50 m are very small and not considered representative of the overall peat slide hazard and have therefore been neglected. The worst case peat slide hazard interacting with the watercourse would therefore be 'likely'. In terms of the environmental exposure interacting with the 'probable' peat slide hazard, this has been reduced to 'low' given the reasons already provided. **The resulting hazard racking is considered 'low'.**
Headpond Works – Main Dam	3	2	3	9	Low	The area around the dam would be stripped of peat to competent rock for the construction for the dam therefore there would be no peat present to slide. Additionally, the rock faced concrete construction of the dam would not be impacted by a peat landslide. There are no watercourses nearby. **The resulting hazard racking is considered 'negligible'.**
Headpond Works – Spillway	4	2	2	8	Low	The Spillway is located in 'probable' peat slide hazard, with large areas of 'likely' and 'unlikely' peat landslide hazard. In the vicinity of the Spillway is Access Track section 5. Although the Spillway is a significant structure, given its scale and mass the infrastructure exposure of this is considered to be 'low'. The Access Track is also considered with an exposure of 'low'. No environmentally significant designation recorded within or in close vicinity to the Spillway and no watercourse is located within 50 m. However, watercourses are located downslope within the vicinity of the Spillway and as such an environmental exposure of 'low' has been applied.

Column 1 Area	Column 2 Assessed Hazard (Worst Case)	Column 3 Assessed Infrastructure Exposure	Column 4 Assessed Environmental Exposure	Column 5 Worst-Case Hazard Ranking	Column 6 Worst-Case Hazard Ranking	Column 7 Comment
						The resulting hazard racking is considered 'low'.
BP Search Area	3 (4)	2 (1)	2	6 (4)	Low	The area within the BP Search Area would be stripped of peat to commission the pit, therefore the peat slide risk within the footprint would be removed. The BP Search Area is located typically in an area of 'unlikely' peat slide hazard', although localised areas of 'likely' hazard are present within 50 m. Blasting may be undertaken to construct the BP Search Area and as such the peat slide hazard has been increased by a ranking of with the general area increased to 'likely' with localised areas of 'probable' peat slide hazard within 50 m. In the vicinity of the BP Search Area is Access Track section 5 and the Main Dam. Both the Access Track and Main Dam are considered to have a peat slide hazard of 'low', however, these would not interact with the 'probable' peat slide hazard within 50 m of the BP Search Area as the Access Track is upslope of the BP Search Area and the Main Dam is not close to any 'probable' peat slide hazard within the vicinity of the BP Search Area. Instead the Access Track and Main Dam would interact with the 'likely' peat slide hazard within 50 m of the BP Search Area. As shown by the rankings provided adjacent. The 'probable' peat slide hazard would only interact within the BP Search Area as this is downslope, as shown in the rankings in brackets. No environmentally significant designation recorded within or in close vicinity to the BP Search Area, however, watercourses and waterbodies are located within 50 m. The watercourses and waterbodies within 50 m would, however, be drained, blocked or sealed as they are present within the Headpond itself as part of the construction process and therefore any peat landslide into them would not cause a pollution incident. As such a 'low' environmental exposure has been applied. **The resulting hazard racking is considered 'low'**
UCW	4 (3)	2	3	12	Moderate	The area within the UCW would be stripped of peat to construct and therefore the peat slide risk within the footprint would be removed. The UCW is located typically in an area of 'negligible' and 'unlikely' peat slide hazard', although localised area of 'likely' hazard is present within 50 m to the east along the shores of Loch nam Breac Dearga. Blasting may be undertaken to construct the UCW and as such the peat slide hazard has been increased by a ranking making the worst case 'probable'. In the vicinity of the UCW is Access Track section 6 Both the Access Track and UCW are considered to have a peat slide hazard of 'low', however, neither of these would interact with the 'probable' peat slide hazard within 50 m of the UCW due to the topography sloping to the southeast at the 'probable' peat slide hazard and not towards the infrastructure. As such, the peat slide hazard interacting with the worst-case infrastructure exposure would be 'likely' as shown in brackets adjacent. A waterbody (Loch nam Breac Dearga) is present within 50 m of the UCW and the 'probable' peat slide hazard. As such, an environmental exposure of 'high' is applied. **The resulting hazard racking is considered 'Moderate'**

7.7.3. The qualitative assessment has identified that 4 No. of the proposed infrastructure aspects are located within 'negligible' Hazard Ranking areas, while 17 No. are located in 'low' Hazard Ranking and lasty 7 no. pieces of infrastructure are considered to have a 'moderate' Hazard Ranking.

8. Mitigation Measures

8.1. General

8.1.1. Construction activities (e.g. excavation, drainage, etc.) are known to have a potential destabilising effect on peat deposits. The design of the Proposed Development should consider the weak and susceptible nature of peat.

8.1.2. Although no historic peat instability has been noted within the Proposed Development Site, appropriate good practice and, where required, mitigation measures should be used to minimise the destabilising effects on the peat and its habitat.

8.1.3. As part of the Proposed Development, a Construction and Environment Management Plan (CEMP) and Construction Management Statement (CMS) should be prepared incorporating good practice measures for the construction of electricity generating schemes in peatland environments. These documents will continue to be updated through pre-construction and construction in accordance with good practice guidance. An Outline CEMP can be found within **Appendix 3.1: Outline Construction Environmental Management Plan (Volume 5: Appendices)**.

8.1.4. It should be noted that further GI will be carried out prior to construction of the Proposed Development to inform the detailed design to design maturity. The GI information will also be used to update the PLHRA, following the PLHRA: BPG.

8.2. Mitigation Measures

8.2.1. Mitigation measures and good practice procedures are ultimately the responsibility of the construction Contractor. That being said, during the construction phase, the following measures may be considered to mitigate the impact on peat:

- Maintaining and updating a Geotechnical Risk Register throughout the works;
- Provision of a geotechnical specialist on-site during the construction phase to undertake advance inspection, carry out regular monitoring and provide advice when required;
- Supervision of construction work by suitably qualified and experienced personnel;
- Identification of areas of deep peat, physical demarcation of such areas and instruction to site personnel to avoid these areas or minimise activities in these locations, where practical;
- Identification of approved areas for stockpiling of any excavated rock or soils including peat;
- Side-casting of material during construction only in appropriate areas identified following risk assessment and agreed with all relevant parties (Environmental Clerk of Works / Geotechnical Clerk of Works, SEPA, NatureScot etc.);
- Avoid placing excavated material or other forms of loading on breaks of slope or other potentially unstable slopes;
- Any excavations in peat should be risk assessed and measures adopted to minimise the risk of failure within excavation side slopes and surrounding materials;
- Excavation on side slopes within peat should be as shallow an angle as possible and care should be taken to stabilise sides;
- Upslope drainage ditches should be included on all earthworks which are constructed through side-long ground;
- The camber of the Access Track should be such as to encourage surface water drainage to the upslope drainage ditch;

- The construction plant should minimise the extent and duration of open excavations and bare ground;
- Earthmoving activities should be restricted during and immediately after heavy and prolonged rainfall events;
- Establish / re-establish vegetation as soon as possible to improve slope stability and provide sediment transport control;
- Design and construction of a suitable drainage system for tracks and hardstanding's that does not significantly affect the hydrological regime of the peat and that would require minimal maintenance;
- Include measures to ensure drainage systems (including existing) are well maintained, including identification of sensitive drainage areas;
- Prevent artificial drainage from concentrated flows onto slopes or into excavations;
- Where deep peat excavations require dewatering, discharges of the pumped water will require to be controlled in a manner which does not adversely affect habitats on-site (due to potential silt content etc.) and does not lead to the creation of saturated, and hence very soft, areas of peat;
- Design of appropriate sediment control measures including the use of silt traps / barriers where necessary and cut-off ditches in particular at appropriate locations along site tracks and earthworks;
- Identification of drainage areas and areas of run-off which could potentially be affected by the development and establish appropriate stand-off distances;
- Monitoring of slope and peat stability both in the vicinity and down slope of infrastructure (both existing and proposed) during construction by suitably experienced and qualified personnel;
- Appropriate track construction methods to take cognisance of local topography, peat thickness and peat features (such as peat pipes, slumps, hags, etc.);
- Development of working methodologies that ensure that any exposed peat is protected to limit the potential for degradation, erosion or failure of the accumulation;
- Where excavated tracks are constructed, the peat and any soft soils should be removed and replaced with granular material placed in layers and compacted;
- Where floating tracks are constructed, a suitable geogrid and separator geotextile (where required) should be laid over the existing ground surface with graded stone (nominally 75mm down) placed over this in layers and compacted. However, a geotextile specialist should be sought regarding this;
- Any floating track design should take into account the properties of the peat soils at the Proposed Development Site;
- Construction staff should be made aware of peat slide indicators and emergency procedures; and
- Emergency procedures should include steps to be taken on detection of an incipient peat slide or of the event occurring.

8.2.2. Many of the measures provided above serve both to mitigate and reduce the likelihood of a peat slide occurring, as well as being good construction practice.

8.2.3. A more detailed PLHRA will be required for the Proposed Development at design maturity post-consent, which includes the findings of further intrusive works to characterise the peat further, which targets more sensitive areas and that provides peat data (e.g. extents & depths throughout the Site). In the meantime, preliminary mitigation measures could include the following:

- Infrastructure with a 'Negligible' Hazard Ranking – ground conditions in these areas may be considered acceptable provided that all infrastructure and access roads are constructed in line with good practice guidelines which will be set out in the CMS / CEMP. However, even in negligible areas, additional intrusive works should be undertaken to assist in the overall characterisation of the peat, as well as for monitoring for signs of potential instability.
- Infrastructure with a 'Low' and 'Moderate' Hazard Ranking, will require additional peat thickness and characteristic information by intrusive investigation and engineering measures may be required and should be considered during the GI, detailed design and construction to minimise risks of triggering a peat landslide in the short term (during construction) or long term (during operation and decommissioning) such as:

- Installation of drainage - Installation of targeted drainage would aim to isolate the areas of peat from upslope surface water. If applicable, re-routing surface (flushes/gullies) and subsurface (pipes) drainage around critical areas will also help control surface water.
- Catch Fences – these should be installed down slope of areas of potential risk and are used to slow or halt run out from a landslide. These would typically be constructed into the peat substrate.
- Catch Ditches – these should be installed down slope of areas of potential risk and like catch wall fences are used to slow or halt run out. These would typically be constructed in non-peat material.
- Monitoring of slope and peat stability both in the vicinity and down slope of track areas during construction by suitably experienced and qualified personnel.

8.2.4. It is considered that such engineering measures would only be used as a last resort in localised areas where a particular hazard could not be avoided or dealt with adequately by other measures. A more detailed peat stability assessment and quantitative PLHRA is required following (post consent) further GI and detailed design to design maturity.

8.2.5. Construction Management, as part of the final CMS, will include but are not limited to:

- Specific work method statements to monitor compliance of activities in susceptible areas.
- Reviewing the weather forecast to prevent working in areas of peat during or immediately following heavy rainfall.
- Construction plant should be operated from the areas already constructed where practicable. Should there be no alternative to plant accessing areas of peat, low ground pressure equipment should be used.
- Spoil disposal areas (both peat and mineral soils) should be located where the risk of erosion, mass movement and water quality deterioration are minimal.
- Continual monitoring of groundwater and ground movement should be maintained.
- Drainage Measures – the installation of drainage measures such as soakaways and gullies (surface water) and pipes (subsurface water) can be used to re-route upslope surface water and groundwater around potential critical areas.
- Localised Slope Re-profiling – this measure would only be recommended where environmental costs have been outweighed by the reduction in the Hazard Ranking.

8.2.6. As detailed in **Table 18. Qualitative Assessment of Peat Landslide Hazard, Exposure and Hazard Ranking**, there are various areas that have a potential ‘Low’ Hazard Ranking. Once the Final PLHRA, inclusive of further GI information and a more quantitative risk assessment, has been undertaken and finds the Hazard Ranking is the same as this Preliminary PLHRA, then **Table 19. Targeted Mitigation for Each Development Area Identified with ‘Low’ or ‘Moderate’ Hazard Ranking** sets out targeted preliminary worst-case mitigation measures that could be used for each of these areas within the Proposed Development Site.

Table 19. Targeted Mitigation for Each Development Area Identified with 'Low' or 'Moderate' Hazard Ranking

Area	Worst-Case Hazard Ranking	Comment
Temporary Compounds (All TCs with a Low Hazard Ranking)	Low	**Installation of drainage –** Installation of targeted drainage around the downslope and upslope side of the Temporary Compounds (TCs) would aim to isolate the areas of peat of 'Likely' peat slide Hazard from upslope surface water. If applicable, re-routing surface (flushes/gullies) and subsurface (pipes) drainage around critical areas will also help control surface water. Drainage measures need to be carefully planned to minimise any negative impacts. **Catch ditches –** Installation of catch ditches upslope of watercourses within the vicinity of the TCs and upslope of TC06 Firefighting Compound to help reduce and/or halt any landslide event from reaching the A831 or watercourses. **Monitoring –** The slope / peat in the vicinity of the TCs, especially in the vicinity of watercourses, could be monitored for any movement during the construction works. Monitoring of water levels within existing watercourses and groundwater levels throughout the Proposed Development Site during construction could also be undertaken.
TC05 - Temporary Workers accommodation	Moderate	**Installation of drainage** – Installation of targeted drainage around the steeper southern sides of the Temporary Workers Accommodation would aim to isolate the areas of peat from upslope surface water. If applicable, re-routing surface (flushes/gullies) and subsurface (pipes) drainage around critical areas will also help control surface water. Drainage measures need to be carefully planned to minimise any negative impacts. **Catch wall fences** – Installation of catch wall fences along the southern side of the compound would aim to reduce and/or halt any landslide event from flowing into the compound area. The fences would need to be engineered in such a way that they are adequately founded into the bedrock and should be inspected periodically and, if required, debris removed. **Catch ditches** - A softer engineering approach to catch wall fences are catch ditches. These could be installed as a first line of defence, to the south of the south of the compound area in-front of the catch wall fences. Catch ditches could also be installed to the north of the compound between it and the River Coiltie.. **Monitoring** – The slope / peat in the vicinity of the TC, especially in the vicinity of the watercourse to the north and the slopes to the south could be monitored for any movement during the construction works. Monitoring of water levels within existing watercourses and groundwater levels throughout the Proposed Development Site during construction could also be undertaken.
Proposed Access Track (All sections with Low Hazard ranking)	Low	**Installation of drainage** – Installation of targeted drainage around the downslope and upslope side of the Access Tracks would aim to isolate the areas of peat of 'probable' and 'Likely' peat slide Hazard from upslope surface water. If applicable, re-routing surface (flushes/gullies) and subsurface (pipes) drainage around critical areas will also help control surface water. Drainage measures need to be carefully planned to minimise any negative impacts. **Monitoring** – the slope / peat on the sides of the Access Track could be monitored for any movement during the construction works. Monitoring of water levels within existing watercourses and groundwater levels throughout the Proposed Development during construction could also be undertaken.
Proposed Access Track Sections 1 & 5	Moderate	**Installation of drainage –** Installation of targeted drainage around the downslope and upslope side of the Access Tracks would aim to isolate the areas of peat of 'probable' and 'Likely' peat slide Hazard from upslope surface water. If applicable, re-routing surface (flushes/gullies) and subsurface (pipes) drainage around critical areas will also help control surface water. Drainage measures need to be carefully planned to minimise any negative impacts. **Catch ditches –** Installation of catch ditches in the vicinity of the A831 and upslope of all watercourses in the vicinity to help reduce and/or halt any landslide event from reaching the A831 or watercourses. **Monitoring –** The slope / peat on the sides of the Access Track, especially in the vicinity of watercourses could be monitored for any movement during the construction works. Monitoring of water levels within existing watercourses and groundwater levels throughout the Proposed Development during construction could also be undertaken. Measure to mitigate against the Tunnel Portals will be presented against them to avoid duplication of measures for the same piece of infrastructure.
Tunnel Portal compounds PC07, 08 & 15	Moderate	**Installation of drainage –** Installation of targeted drainage around the upslope side of the Tunnel Portals would aim to isolate the areas of peat of 'probable' and 'Likely' peat slide Hazard from upslope surface water. If applicable, re-routing surface (flushes/gullies) and subsurface (pipes) drainage around critical areas will also help control surface water. Drainage measures need to be carefully planned to minimise any negative impacts. **Catch wall fences and catch ditches** – Installation of catch wall fences and catch ditches on the slopes to the south of the portals to help reduce and/or halt any landslide event from reaching the proposed Tunnel Portals. **Monitoring** – The slope / peat around the portals, could be monitored for any movement during the construction works. Monitoring of water levels within existing watercourses and groundwater levels throughout the Proposed Development during construction could also be undertaken. **Blasting –** Prior to blasting all personnel and plant should be moved from the area and the Access Tracks in the vicinity closed in-case a peat slide is detected. Following blasting activities, the peat surrounding the area shall be monitored and inspected for any signs of potential peat failure prior to opening the Access Track and portals for works/traffic.
PC04 - Switchyard Compound, PC12 – Valve House & PC14 – Ventilation Compound	Low	**Installation of drainage –** Installation of targeted drainage around the upslope side and downslope sides of the compounds would aim to isolate the areas of peat of 'Likely' peat slide Hazard from upslope surface water. If applicable, re-routing surface (flushes/gullies) and subsurface (pipes) drainage around critical areas will also help control surface water. Drainage measures need to be carefully planned to minimise any negative impacts. **Catch ditches** – Installation of catch ditches on the southern side of PC04, eastern side of PC14 and upslope of all watercourses in the vicinity to help reduce and/or halt any landslide event from reaching the compounds or watercourses. **Monitoring –** The slope / peat on the sides of the compounds, especially in the vicinity of watercourses could be monitored for any movement during the construction works. Monitoring of water levels within existing watercourses and groundwater levels throughout the Proposed Development during construction could also be undertaken.
Headpond works – Dams and Spillway	low	**Installation of drainage –** Installation of targeted drainage around the Dams and Spillway would aim to isolate the areas of peat of 'Probable' and 'Likely' peat slide Hazard from upslope surface water. If applicable, re-routing surface (flushes/gullies) and subsurface (pipes) drainage around critical areas will also help control surface water. Drainage measures need to be carefully planned to minimise any negative impacts.

Area	Worst-Case Hazard Ranking	Comment
		Catch ditches – Installation of catch ditches on upslope of all watercourses in the vicinity to help reduce and/or halt any landslide event from reaching the compounds or watercourses. **Monitoring – T**he slope / peat around the dams, especially in the vicinity of watercourses could be monitored for any movement during the construction works. Monitoring of water levels within existing watercourses and groundwater levels throughout the Proposed Development during construction could also be undertaken.
BP Search Area	Low	**Catch ditches** – Installation of catch ditches to the south pit between the BP Search Area and Loch nam Breac Dearga to help reduce and/or halt any landslide event from reaching the compounds or watercourses. **Monitoring –** The slope / peat around the BP Search Area, especially in the vicinity of watercourses and waterbodies could be monitored for any movement during the construction works. Monitoring of water levels within existing watercourses and groundwater levels throughout the Proposed Development during construction could also be undertaken. **Blasting –** Prior to blasting all personnel and plant should be moved from the area and the Access Tracks in the vicinity closed in-case a peat slide is detected. Following the blasting activities, the peat surrounding the area shall be monitored and inspected for any signs of potential peat failure prior to opening the Access Tracks and BP Search Area for works/traffic.
UCW	moderate	**Catch ditches** – Installation of catch ditches to around the north of the UCW to help reduce and/or halt any landslide event from entering the area during construction. **Monitoring –** The slope / peat around the works, especially in the vicinity of the waterbody could be monitored for any movement during the construction works. Monitoring of water levels within existing watercourses and groundwater levels throughout the Proposed Development during construction could also be undertaken. **Blasting –** Prior to blasting all personnel and plant should be moved from the area and the Access Tracks in the vicinity closed in-case a peat slide is detected. Following the blasting activities, the peat surrounding the area shall be monitored and inspected for any signs of potential peat failure prior to opening the Access Tracks and UCW for works/traffic. **Headpond –** Given the waterbody to the south forms part of the Headpond and due to the proximity of the UCW to the waterbody, it would be difficult and impractical to design hard engineering measures to reduce or halt a peat landslide from entering the Loch nam Breac Dearga. Also, as the peat outwith the UCW and BP Search Area is to remain in place at the base of the Headpond and not be removed as part of the construction, the constant hydraulic change is likely to disrupt and move the peat as part of the PSH operation. As such, the Headpond would be designed to contain any peat landslide contamination to within the Headpond itself and not allow flow of debris/contaminants within the watercourse network.

8.2.7. As previously noted, areas where peat will be reused or restored are currently being developed and are in the design stage. Although these areas may increase the risk of peat instability at the Proposed Development Site, design and construction techniques to mitigate against the instability of the areas for reuse or restoration will be developed. Where these areas are within areas where Hazard Ranking is assessed to be Low, the measures used to design and construct these may supersede the measures highlighted within **Table 19. Targeted Mitigation for Each Development Area Identified with 'Low' or 'Moderate' Hazard Ranking** as they will be embedded within the reuse/restoration design and would aim to reduce the peat instability risk.

8.3. Potential Peat Slide Indicators

8.3.1. During the site works (i.e. GI works or Construction works), site staff should be made aware of the slope failure indicators, how to recognise them and the importance and mechanism for reporting these. They should also receive training and instruction in emergency procedures in the event of a peat slide. This will minimise the impact should a peat slide occur.

8.3.2. There are a number of recognised indicators for slope failures and these can also indicate the potential of a peat slide event. The factors below are particularly applicable to low velocity events:

- The development of tension cracks across the slope or in semi-circular patterns showing progressive development;
- Boggy ground or new springs appearing at the base of slopes;
- Sudden reactivation / drying up of spring lines, drainage channels or streams;
- Creep and bulging of ground;
- Displacement and leaning of trees, fence posts, dykes, etc.; and
- Breaking of underground services.

9. Conclusions and Recommendations

9.1. Conclusions

9.1.1. The general approach to the infrastructure design has been to design the Proposed Development to avoid areas of deep peat deposits (i.e. >1.0 m thickness) wherever possible.

9.1.2. As indicated in **Figure 15.3.10 Peat Slide Assessed Hazard (Annex A Figures)** the peat slide hazard for the Proposed Development Site is generally assessed to be either 'Negligible' or 'Unlikely'. However, some of the infrastructure components of the Proposed Development are located in or within 50 m of an area with a peat slide Hazard of 'Likely' or 'probable'.

9.1.3. From the qualitative assessment (**Table 18. Qualitative Assessment of Peat Landslide Hazard, Exposure and Hazard Ranking**) of the construction components within the Proposed Development Site, the proposed infrastructure was assessed with 14% being classed with a Hazard Ranking of 'Negligible', 61% classified with a Hazard Ranking of 'Low' and 25% classified with a Hazard Ranking of 'Moderate'.

9.1.4. The majority of the proposed infrastructure is located in areas assessed as having a Hazard Ranking of 'Low', meaning that the project can proceed as long as further investigation to refine the assessment and mitigate the hazard is undertaken. It should be noted that even after this Preliminary PLHRA, the Hazard Ranking is considered to be relatively conservative given the approach undertaken. As such, it is considered that following a quantitative assessment, which incorporates further more detailed GI data and further details on the design and construction, the Hazard Rankings will reduce from that identified within this PLHRA.

9.1.5. For components assessed with a 'Low' and 'Moderate', targeted worst-case mitigation measures have been outlined that could be implemented to reduce the Hazard and Exposure. The decision on whether further analysis is undertaken and/or the selection and details on the mitigation measures used shall be determined by the Designer of the Proposed Development. A detailed Final PLHRA shall be carried out for the Proposed Development, using additional information collected during the additional GI undertaken

post consent, and considering further details of the design of the scheme after this reaches design maturity. As part of the Final PLHRA, it is considered that the Hazard Ranking at several locations will be reduced following the provision of further information and a more detailed qualitative assessment.

9.1.6. The Proposed Development will include the reuse of peat in some form as part of the works. The extent of reuse /restoration is still in the design and development stage and as such has not been included as part of this PLHRA. It is acknowledged that this reuse/restoration of the peat may increase the peat instability risk on the Proposed Development Site, however, it is difficult to quantify this without knowing the full details on the design of these areas. The design of the reuse/restoration areas may also reduce the peat instability risk through engineering measures installed to contain the peat. This may reduce the Hazard Ranking currently assigned to certain areas. As such, the Final PLHRA shall consider the effect that these areas have on the peat stability within the Proposed Development Site considering the further investigative information obtained and the detailed design.

9.1.7. The construction Contractor will be required to produce a CMS for the construction of the Proposed Development. This should include the results of the Final PLHRA, which will be a further development of this Preliminary PLHRA. The Final PLHRA will provide detailed procedures and methods intended to be used by the construction Contractor to minimise any environmental impact, including the risk of any peat slide events.

9.2. Recommendations

9.2.1. Further GI should be undertaken across the Proposed Development Site, to include exploratory holes, to better define the composition and ‘truth’ the depth/extent of peat estimated through the probing survey undertaken to inform this Preliminary PLHRA. Further GI should specifically target the areas within the Proposed Development Site which were assessed as having ‘Low’ and ‘Moderate’ Hazard Rankings.

9.2.2. The GI shall also allow for the collection of additional information on peat thickness and characteristic properties (including laboratory testing of samples as set out in the PLHRA: BPG), so that the Final PLHRA can determine whether the extent of these areas can be reduced and allow for the detailed targeting of any mitigation measure required.

9.2.3. The GI shall also allow for the production of a quantitative assessment of the peat slide hazard if required. However, the GI should not be limited to said areas and information on the peat should be collected across the Proposed Development Site to allow for the peat to be better characterised.

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Annex A Figures

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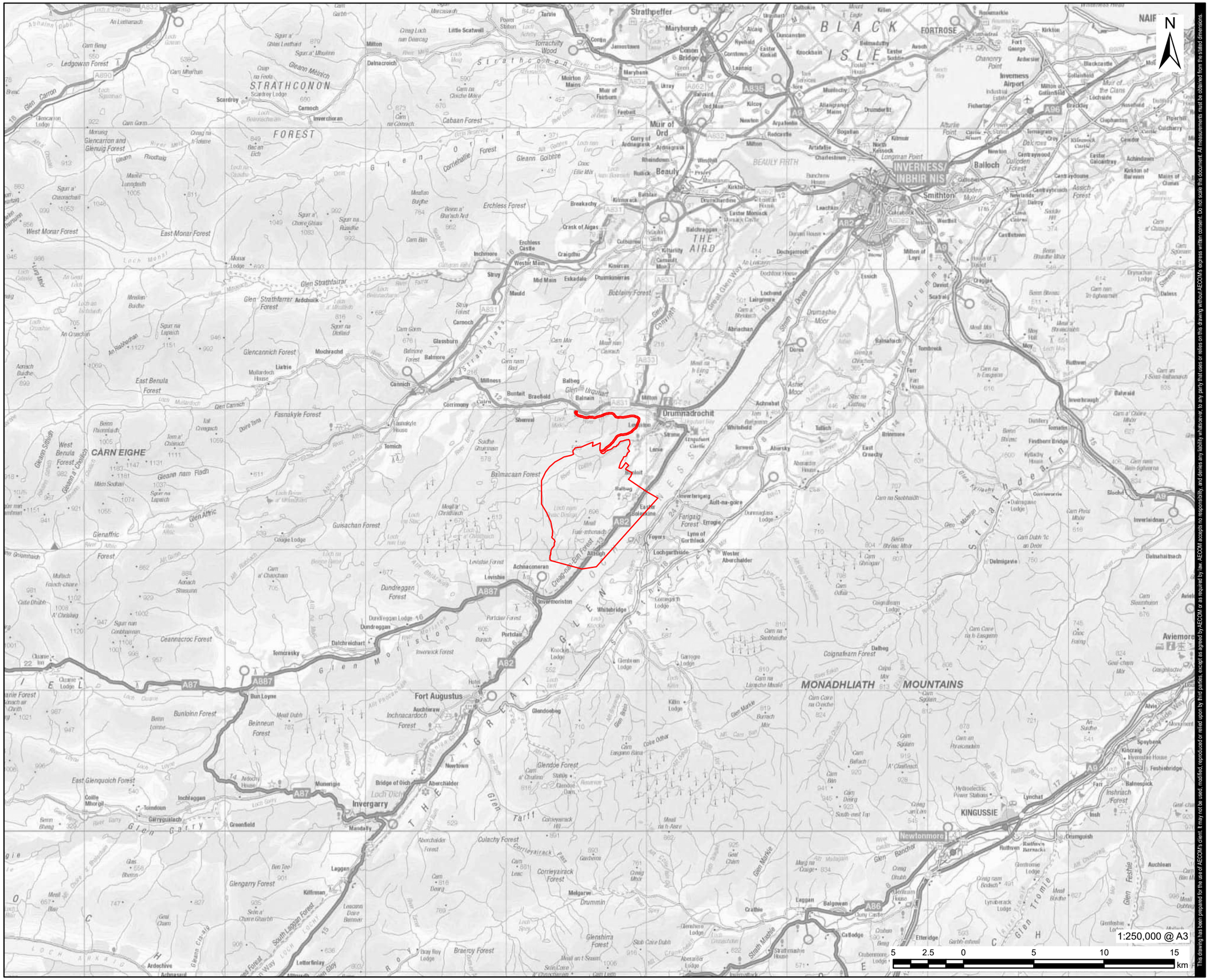

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LEGEND

Red Line Boundary

NOTES

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Scheme Location

FIGURE NUMBER

Figure 15.3.1

Revision: 3 Drawn: MH Checked: FM Approved: JR Date: 2025-03-27

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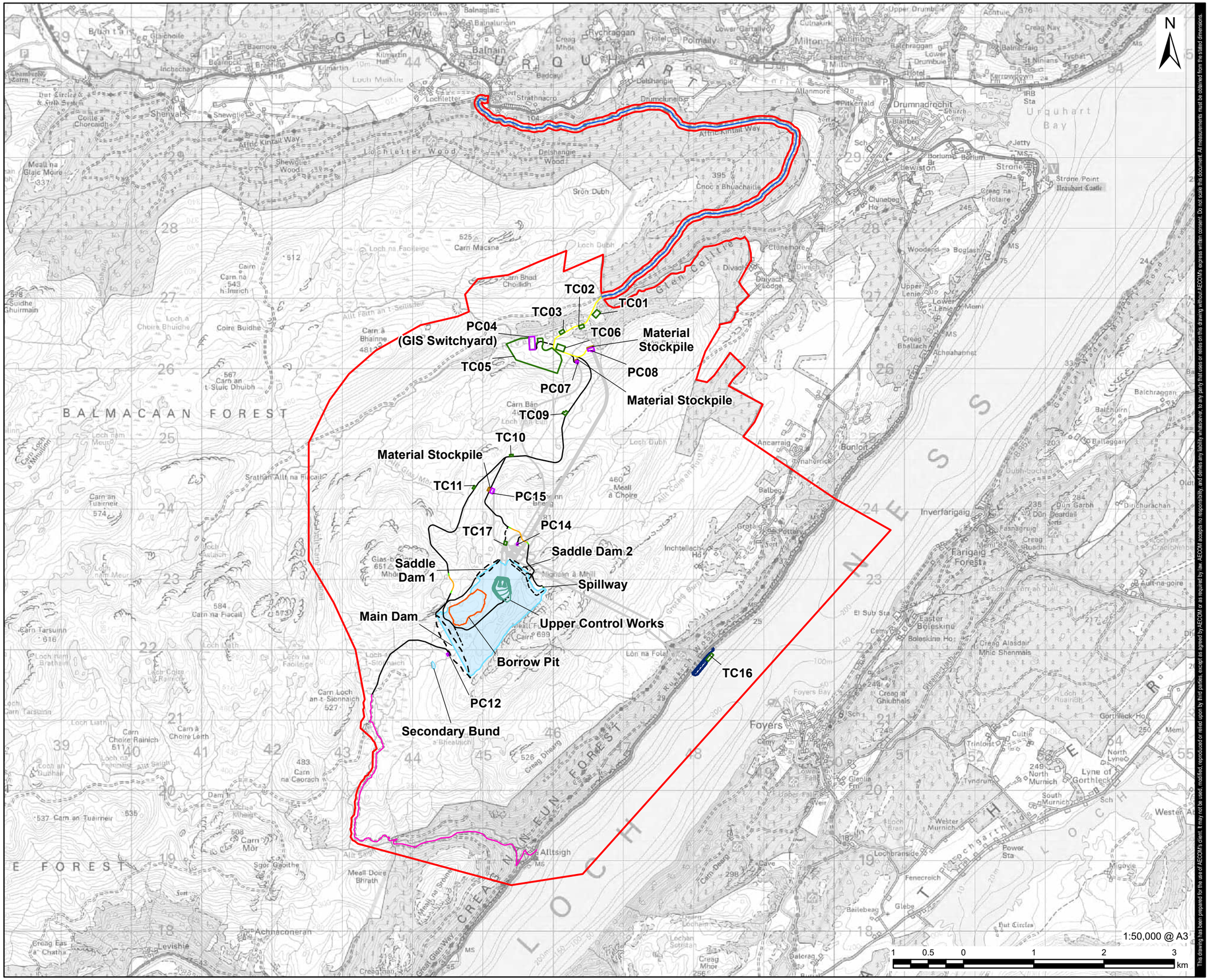

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LEGEND

- Red Line Boundary
- Below Ground Infrastructure
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Upper Control Works
- Lower Control Works

Access Tracks

- Construction Phase - Permanent
- Construction Phase - Permanent (Floating)
- Construction Phase - Permanent (Floating Transition)
- Construction Phase - Temporary (Construction)
- Pre-Construction Phase - Existing
- Pre-Construction Phase - Permanent
- Operation Phase - Existing

Headpond

- Dam
- Spillway
- Borrow Pit
- Top Water Level

NOTES

Please refer to Appendix 15.2 Outline Peat Management Plan for details on protection of near natural bog and measures to limit impacts.

Below ground infrastructure not assessed as justified within Section of the 1.0 of the PLHRA Report. However, below ground infrastructure shown for context.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

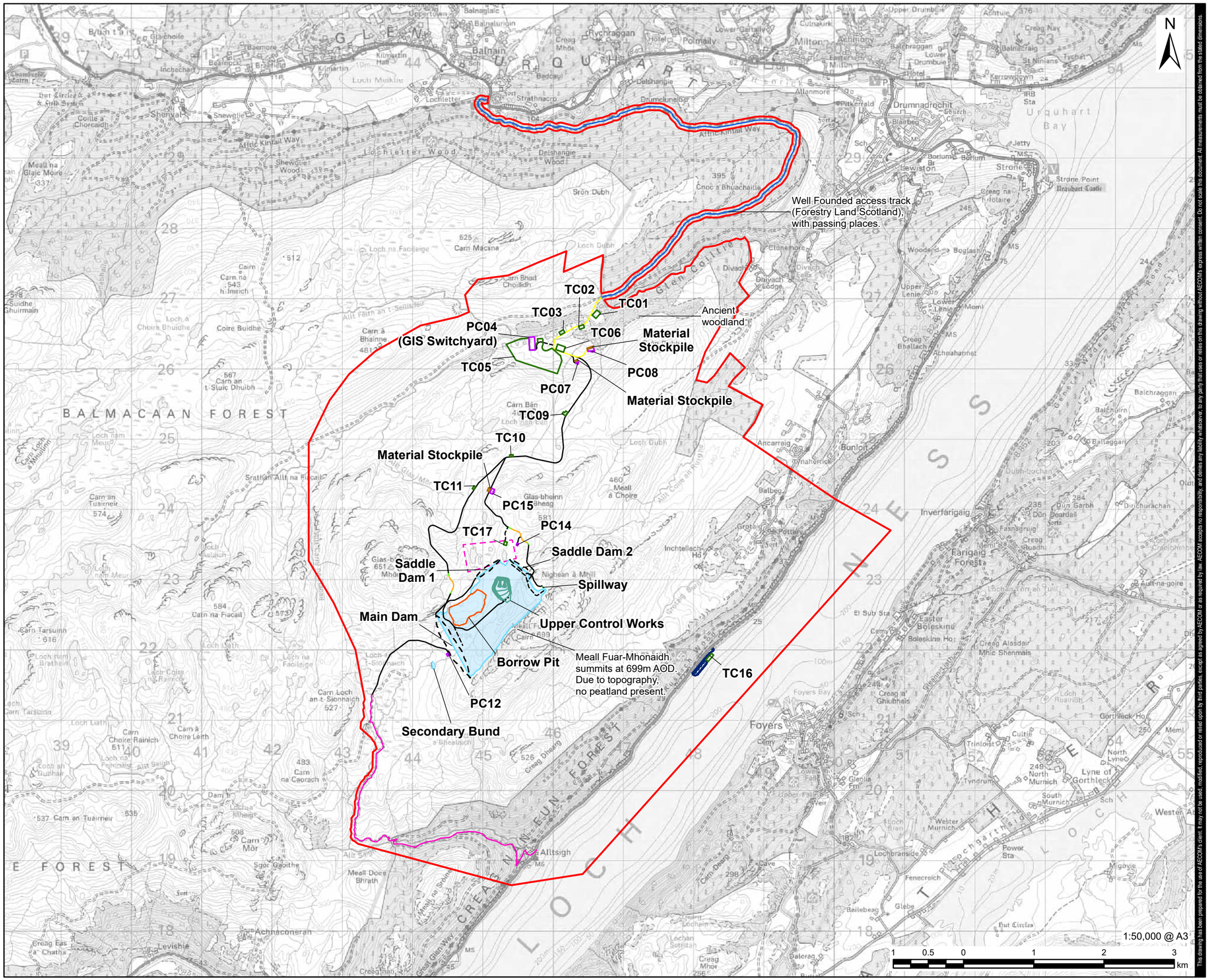
60719875

FIGURE TITLE

Above Ground Layout Plan

FIGURE NUMBER

Figure 15.3.2



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LEGEND

- Red Line Boundary
- Breeding Bird Habitat
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Upper Control Works
- Lower Control Works

Access Tracks

- Construction Phase - Permanent
- Construction Phase - Permanent (Floating)
- Construction Phase - Permanent (Floating Transition)
- Construction Phase - Temporary (Construction)
- Pre-Construction Phase - Existing
- Pre-Construction Phase - Permanent
- Operation Phase - Existing

Headpond

- Dam
- Spillway
- Borrow Pit
- Top Water Level

NOTES

Below ground infrastructure not assessed as justified within Section 1 of the PLHRA Report.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Site Walkover Features

FIGURE NUMBER

Figure 15.3.3

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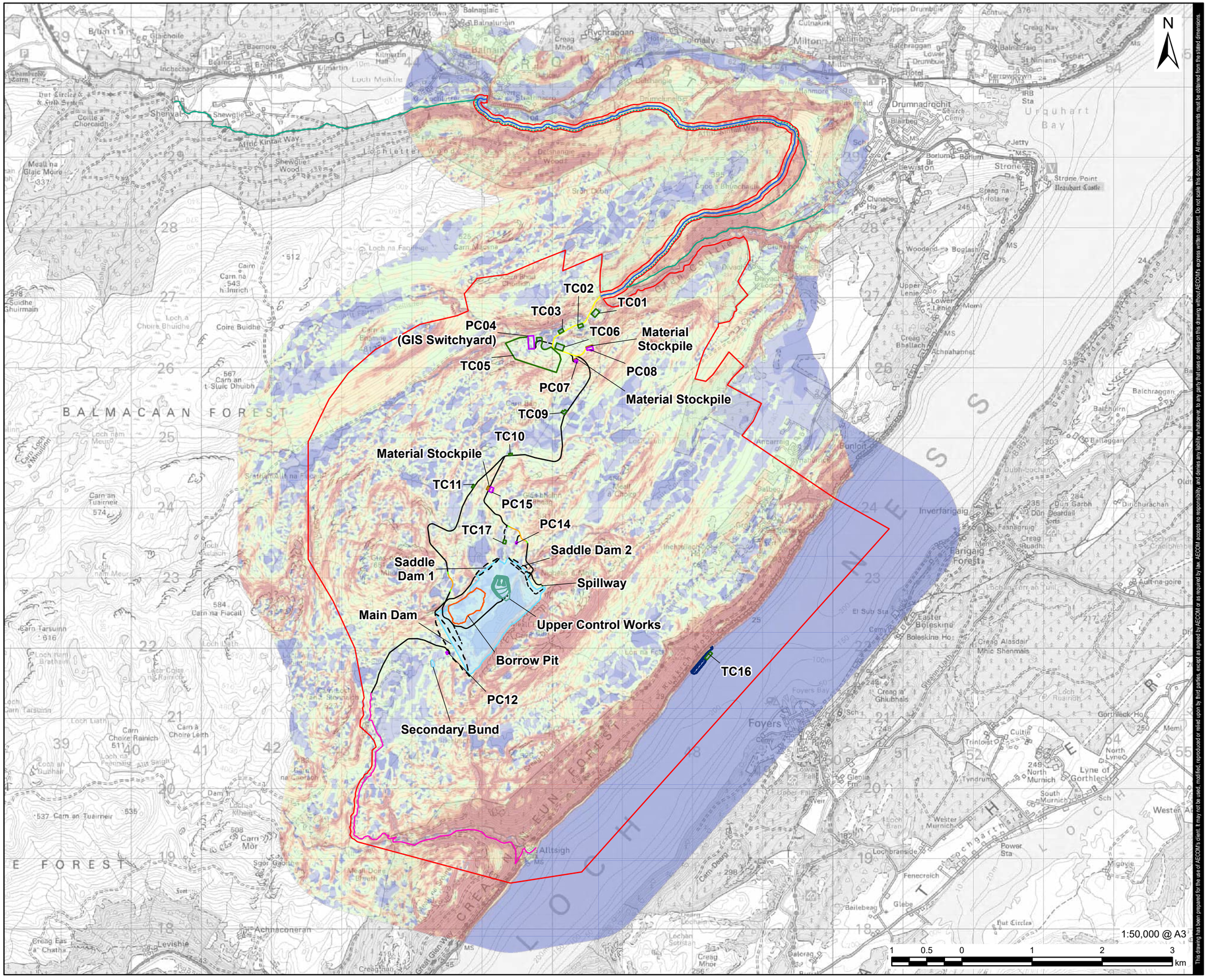

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Upper Control Works
- Lower Control Works
- Core Path Existing Route
- Core Path Route Re-alignment

Access Tracks

- Construction Phase - Permanent
- Construction Phase - Permanent (Floating)
- Construction Phase - Permanent (Floating Transition)
- Construction Phase - Temporary (Construction)
- Pre-Construction Phase - Existing
- Pre-Construction Phase - Permanent
- Operation Phase - Existing

Headpond

- Borrow Pit
- Dam
- Spillway
- Top Water Level

Slope (Degrees) - OS Terrain 5

- 0 - 2
- 2.001 - 5
- 5.001 - 10
- 10.001 - 15
- 15.001 - 20
- 20+

NOTES

Below ground infrastructure not assessed as justified within Section 1 of the PLHRA Report.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Topography

FIGURE NUMBER

Figure 15.3.4

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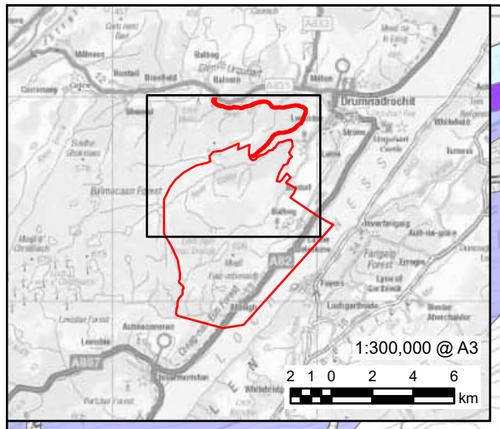

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Core Path Existing Route
- Core Path Route Re-alignment

Access Tracks

- Construction Phase - Permanent
- Construction Phase - Permanent (Floating)
- Construction Phase - Permanent (Floating Transition)
- Construction Phase - Temporary (Construction)
- Pre-Construction Phase - Existing
- Pre-Construction Phase - Permanent

Headpond

- Dam
- Top Water Level

Superficial Geology

- Fluvial Deposits
- Glacial Deposits
- Glacigenic Deposits
- Glaciofluvial Deposits
- Glaciolacustrine Deposits
- Lacustrine Deposits
- Organic Deposits

NOTES

The superficial data are derived from 1:50k British Geological Survey (BGS) maps that have been supplemented with AECOM-digitised information from the available 1:10k BGS field maps (numbers 13736411 and 13736201) where the 1:50k data lacked coverage over the eastern portion of the site.

Below ground infrastructure not assessed as justified within Section 1 of the PLHRA Report.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Superficial Geology

FIGURE NUMBER

Figure 15.3.5 (Sheet 1 of 2)

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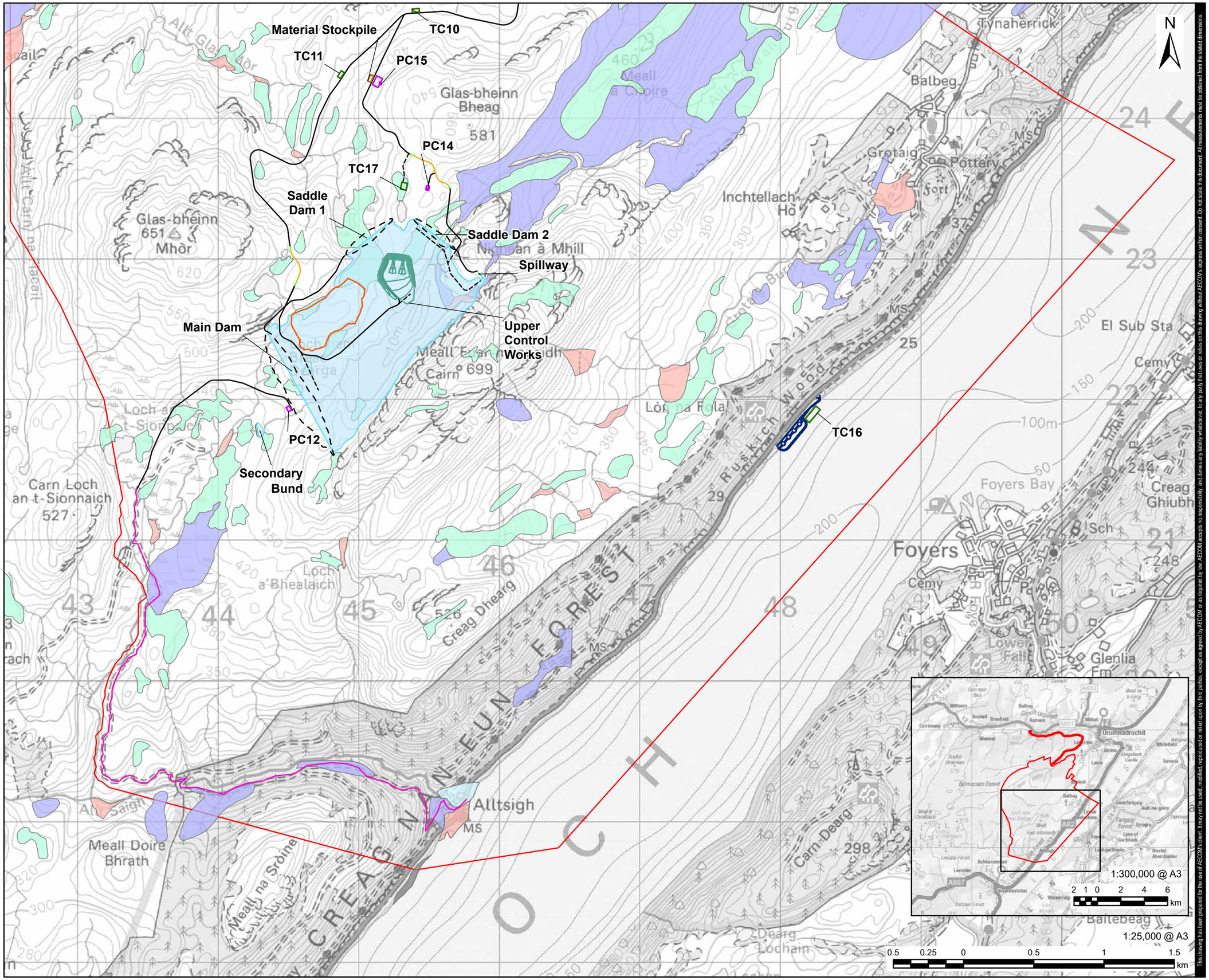

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Glen Earrach Pumped Storage Hydro

CLIENT

Glen Earrach Energy Ltd.

CONSULTANT

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EH3 5DA
www.aecom.com

LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Upper Control Works
- Lower Control Works

Access Tracks

- Construction Phase - Permanent
- Construction Phase - Permanent (Floating)
- Construction Phase - Permanent (Floating Transition)
- Construction Phase - Temporary (Construction)
- Operation Phase - Existing

Headpond

- Dam
- Spillway
- Borrow Pit
- Top Water Level

Secondary Bund

- Dam
- Top Water Level

Superficial Geology

- Fluvial Deposits
- Glacigenic Deposits
- Glaciofluvial Deposits
- Lacustrine Deposits
- Organic Deposits

NOTES

The superficial data are derived from 1:50k British Geological Survey (BGS) maps that have been supplemented with AECOM-digitised information from the available 1:10k BGS field maps (numbers 13736411 and 13736201) where the 1:50k data lacked coverage over the eastern portion of the site.

Below ground infrastructure not assessed as justified within Section 1 of the PLHRA Report.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Superficial Geology

FIGURE NUMBER

Figure 15.3.5 (Sheet 2 of 2)

Revision: 0 Drawn: MH Checked: AR Approved: JR Date: 2025-03-26

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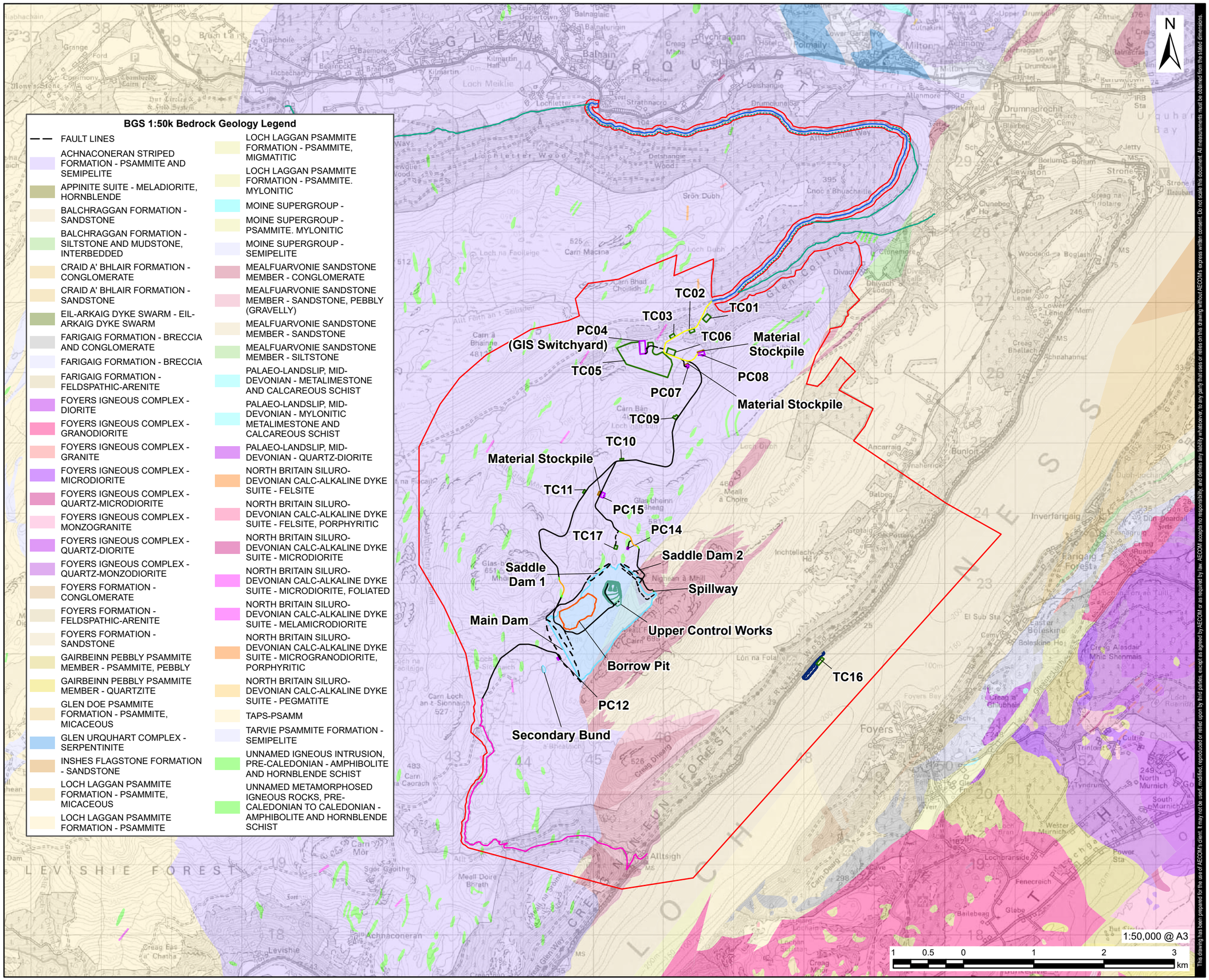

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Upper Control Works
- Lower Control Works
- Core Path Existing Route
- Core Path Route Re-alignment

Access Tracks

- Construction Phase - Permanent
- Construction Phase - Permanent (Floating)
- Construction Phase - Permanent (Floating Transition)
- Construction Phase - Temporary (Construction)
- Pre-Construction Phase - Existing
- Pre-Construction Phase - Permanent
- Operation Phase - Existing

Headpond

- Dam
- Spillway
- Borrow Pit
- Top Water Level

NOTES

Below ground infrastructure not assessed as justified within Section 1 of the PLHRA Report.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Bedrock Geology

FIGURE NUMBER

Figure 15.3.6

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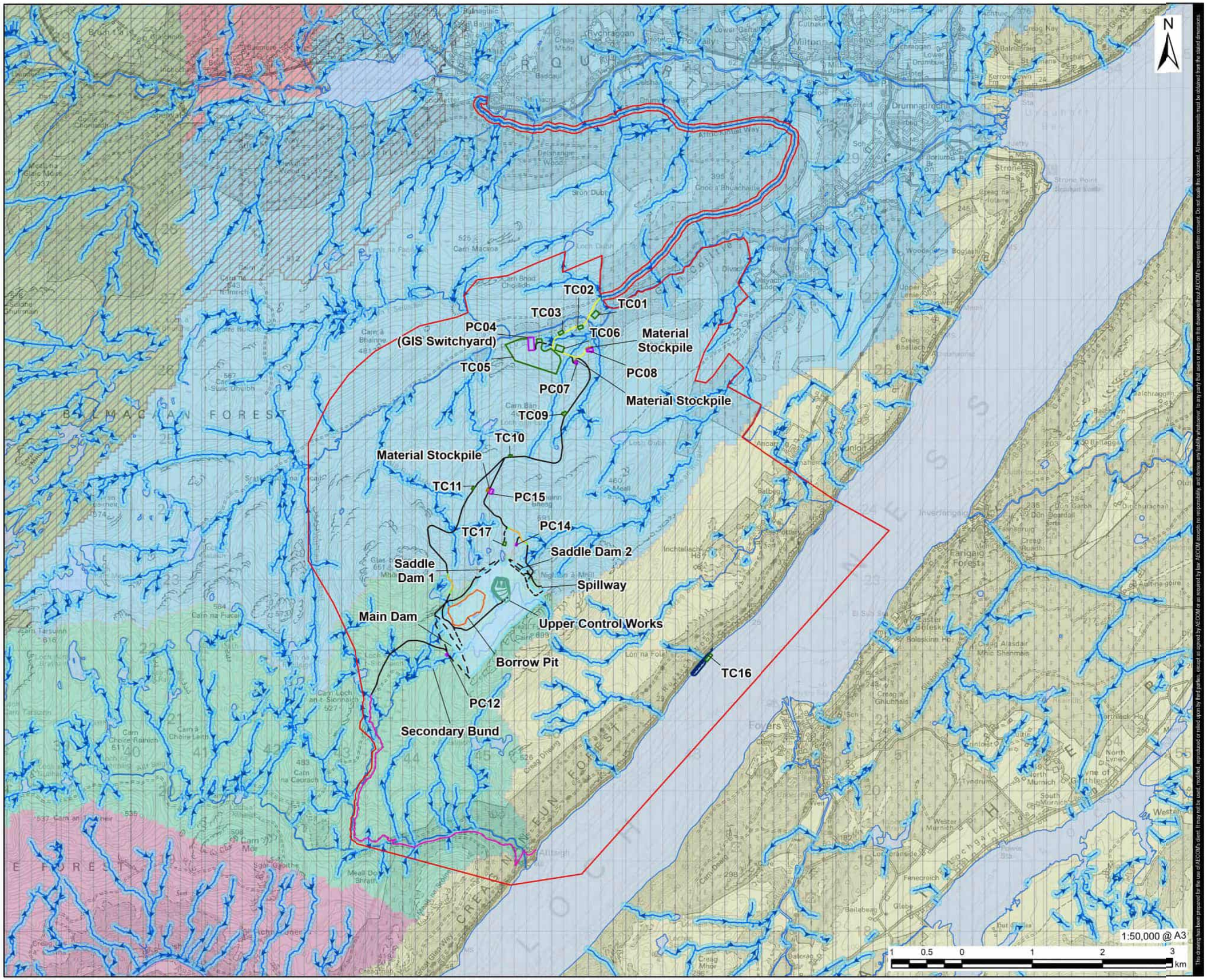

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LEGEND

- Development Site Boundary
- Watercourse
- Watercourse - 50 m Buffer
- Surface Water
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Upper Control Works
- Lower Control Works

Access Tracks

- Construction Phase - Permanent
- Construction Phase - Permanent (Floating)
- Construction Phase - Permanent (Floating Transition)
- Construction Phase - Temporary (Construction)
- Pre-Construction Phase - Existing
- Pre-Construction Phase - Permanent
- Operation Phase - Existing

Headpond

- Dam
- Spillway
- Borrow Pit
- Top Water Level

River and Loch Catchment Areas

- River Ness - Inverness Firth to Loch Ness
- River Enrick - Loch Ness to Loch Meiklie
- River Enrick - Loch Meiklie to Allt Seanabhaile confluence
- Allt Saigh
- River Moriston - Loch Ness to Dundreggan Dam
- River Enrick - headwaters
- Loch Meiklie
- Loch Ness

NOTES

Below ground infrastructure not assessed as justified within Section 1 of the PLHRA Report.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Hydrology

FIGURE NUMBER

Figure 15.3.7

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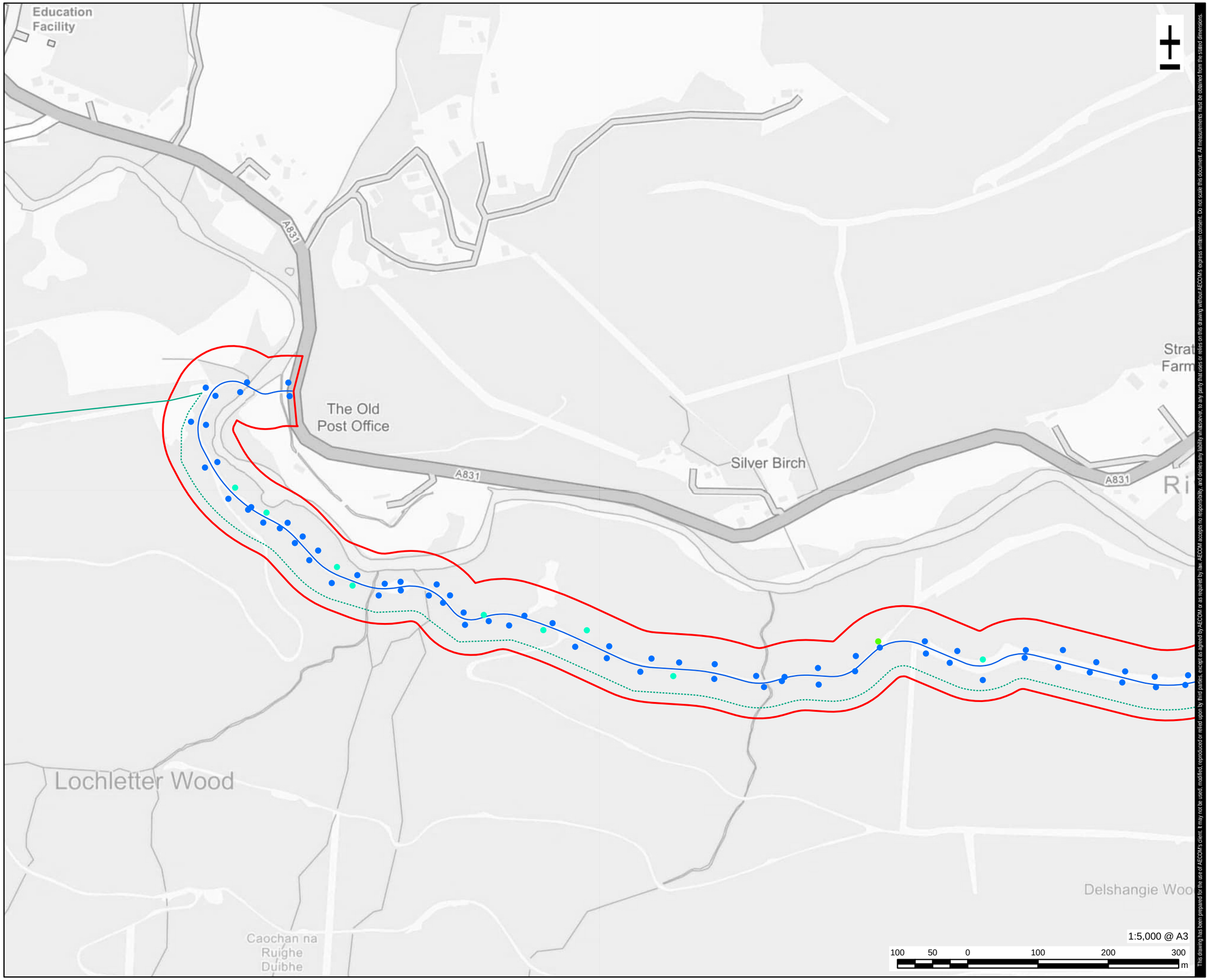

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LEGEND

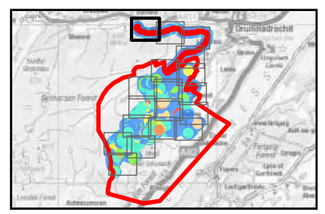
- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Core Path Existing Route
- Core Path Route Re-alignment

Access Tracks

- Pre-Construction Phase - Existing

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50



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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

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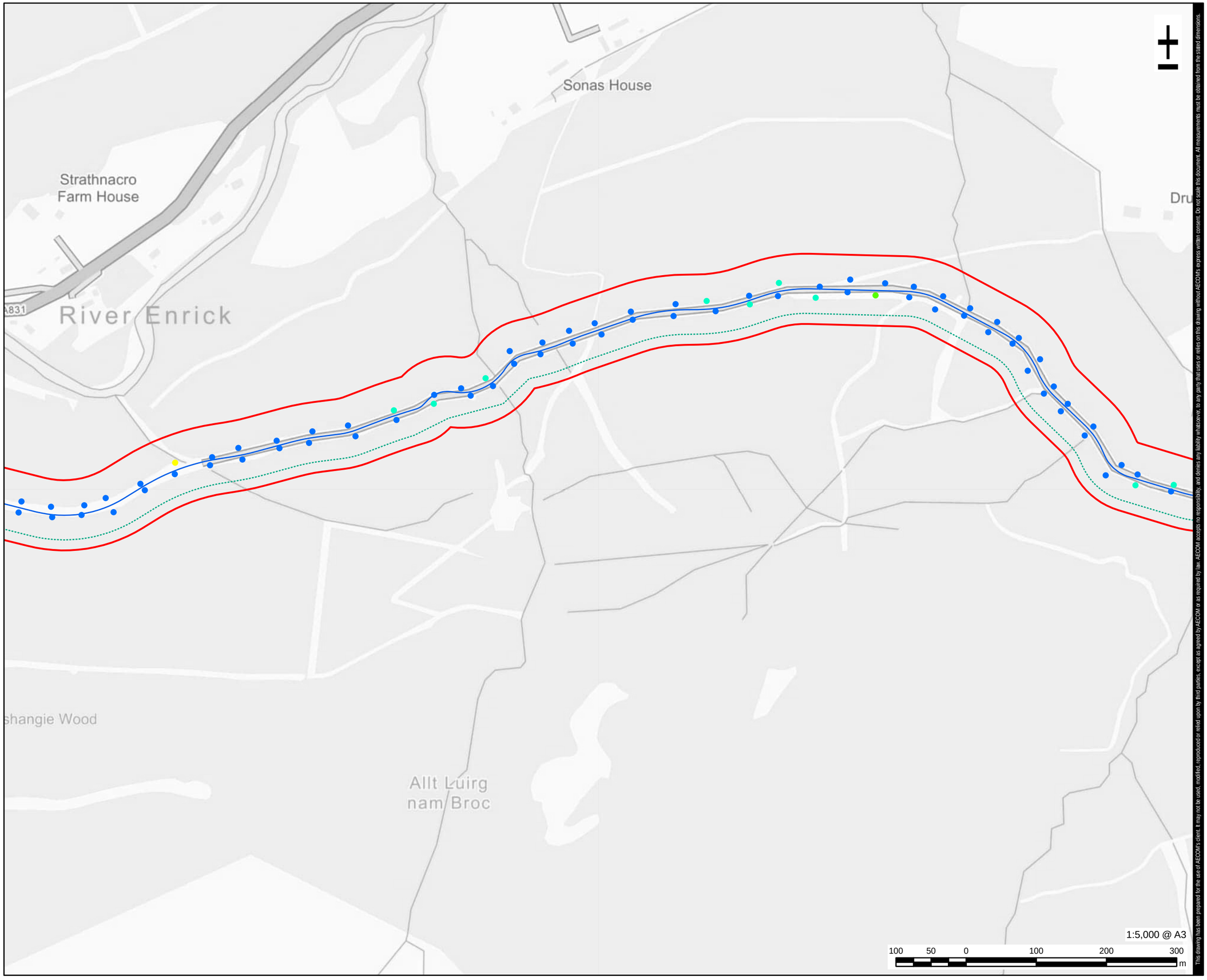

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Core Path Route Re-alignment

Access Tracks

- Pre-Construction Phase - Existing

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00

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FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

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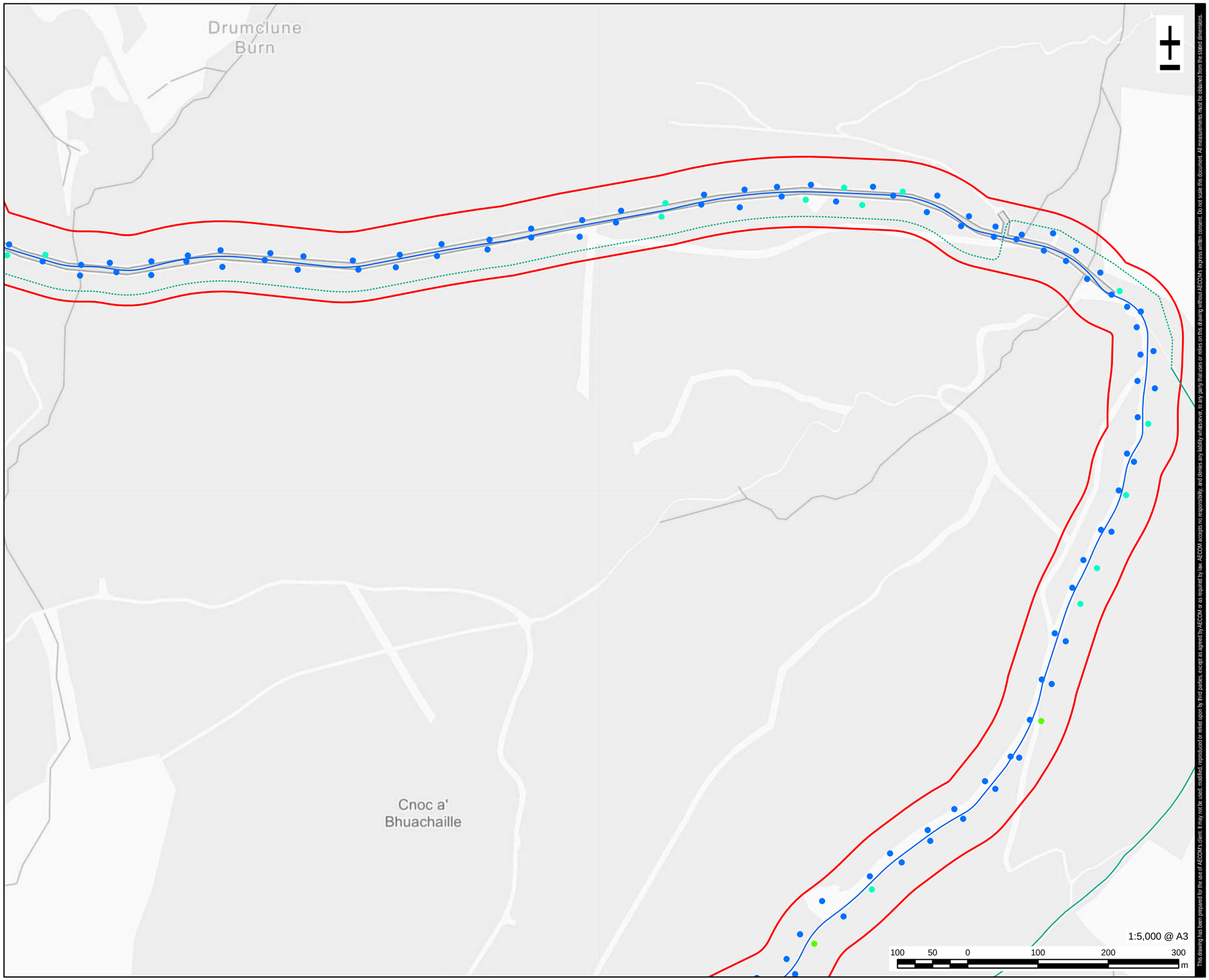

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Core Path Existing Route
- Core Path Route Re-alignment

Access Tracks

- Pre-Construction Phase - Existing

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50

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FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

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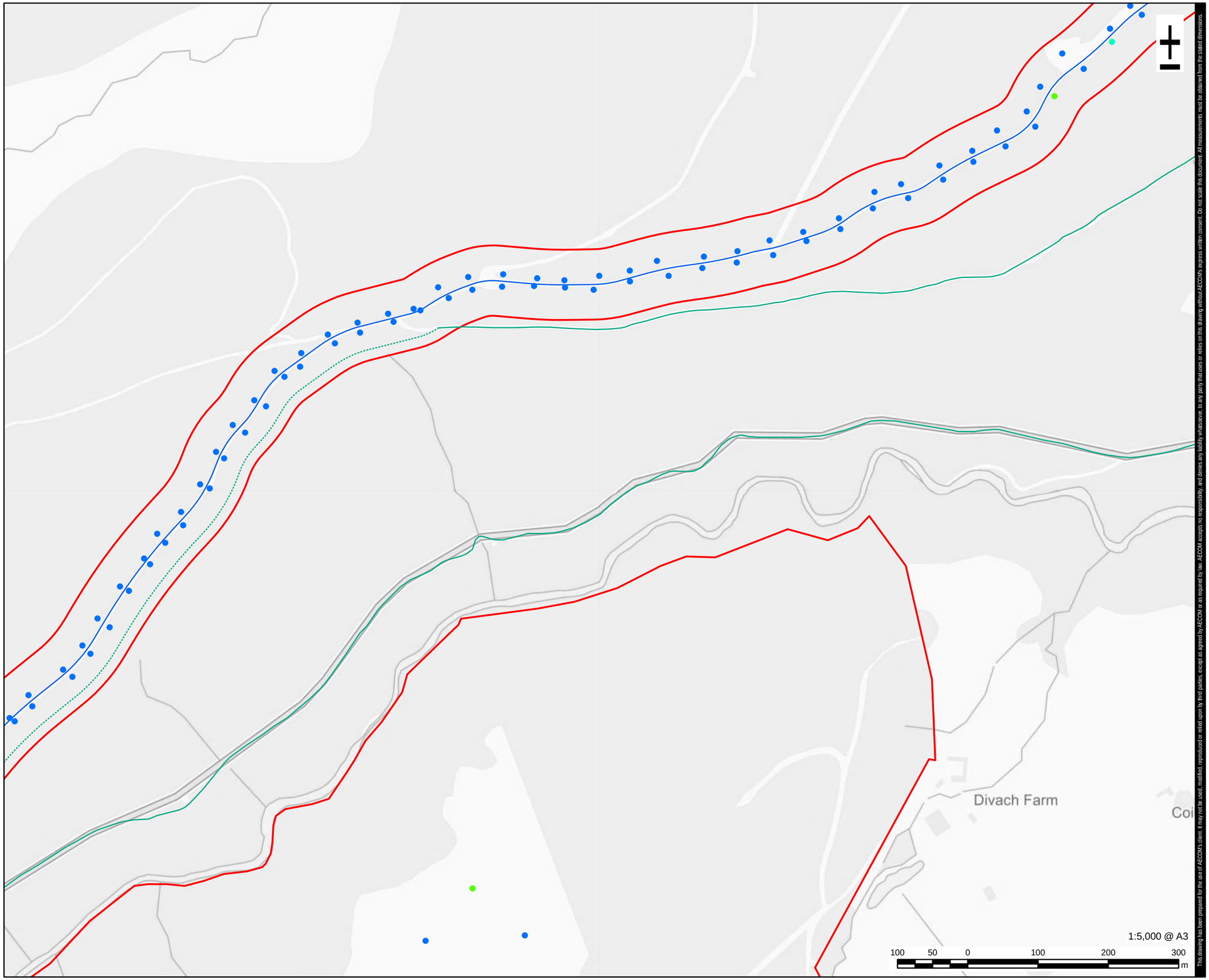

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Core Path Existing Route
- Core Path Route Re-alignment

Access Tracks

- Pre-Construction Phase - Existing

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50

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PROJECT NUMBER

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FIGURE TITLE

Peat Probe Survey Results

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Figure 15.3.8

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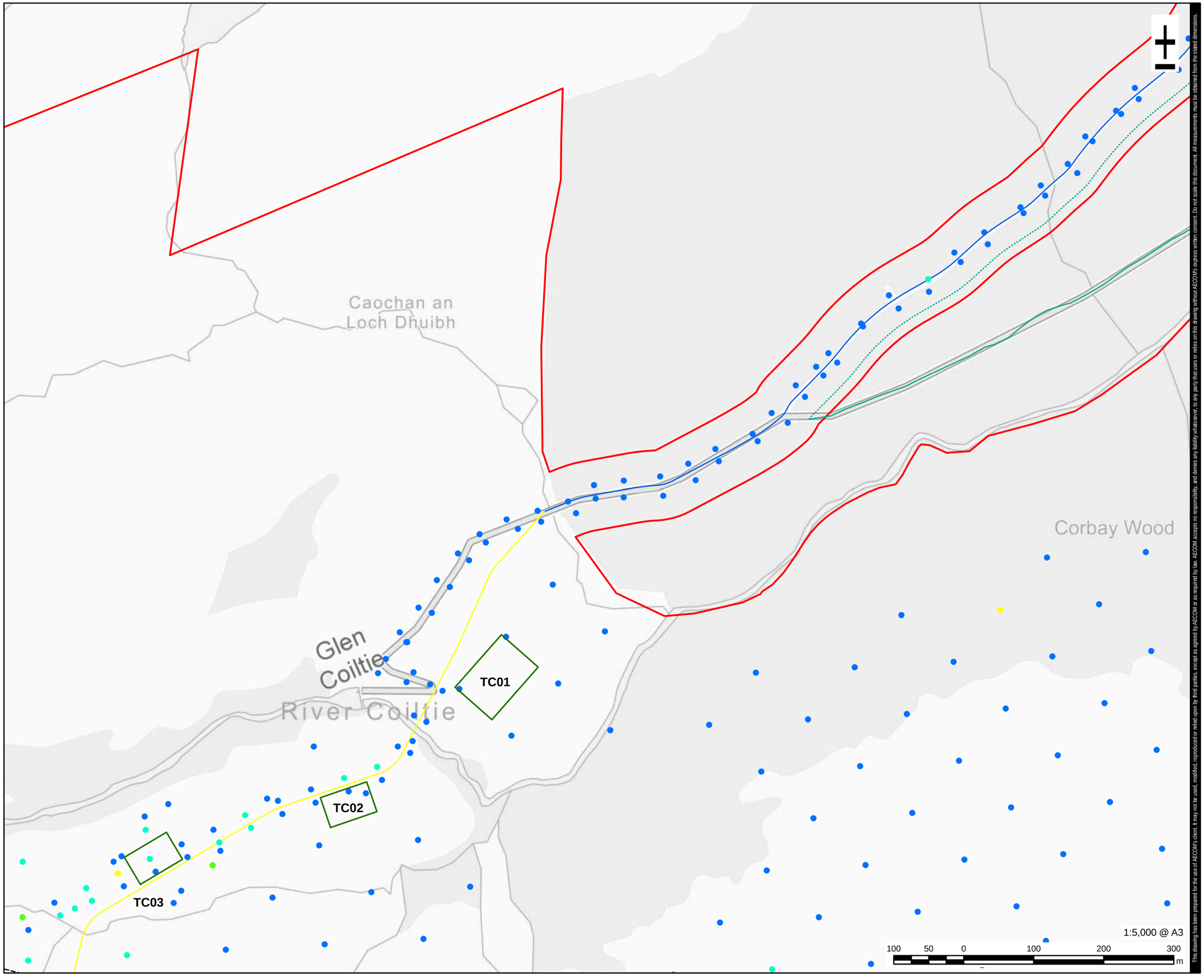

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Core Path Existing Route
- Core Path Route Re-alignment

Access Tracks

- Construction Phase - Temporary (Construction)
- Pre-Construction Phase - Existing
- Pre-Construction Phase - Permanent

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00

NOTES

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

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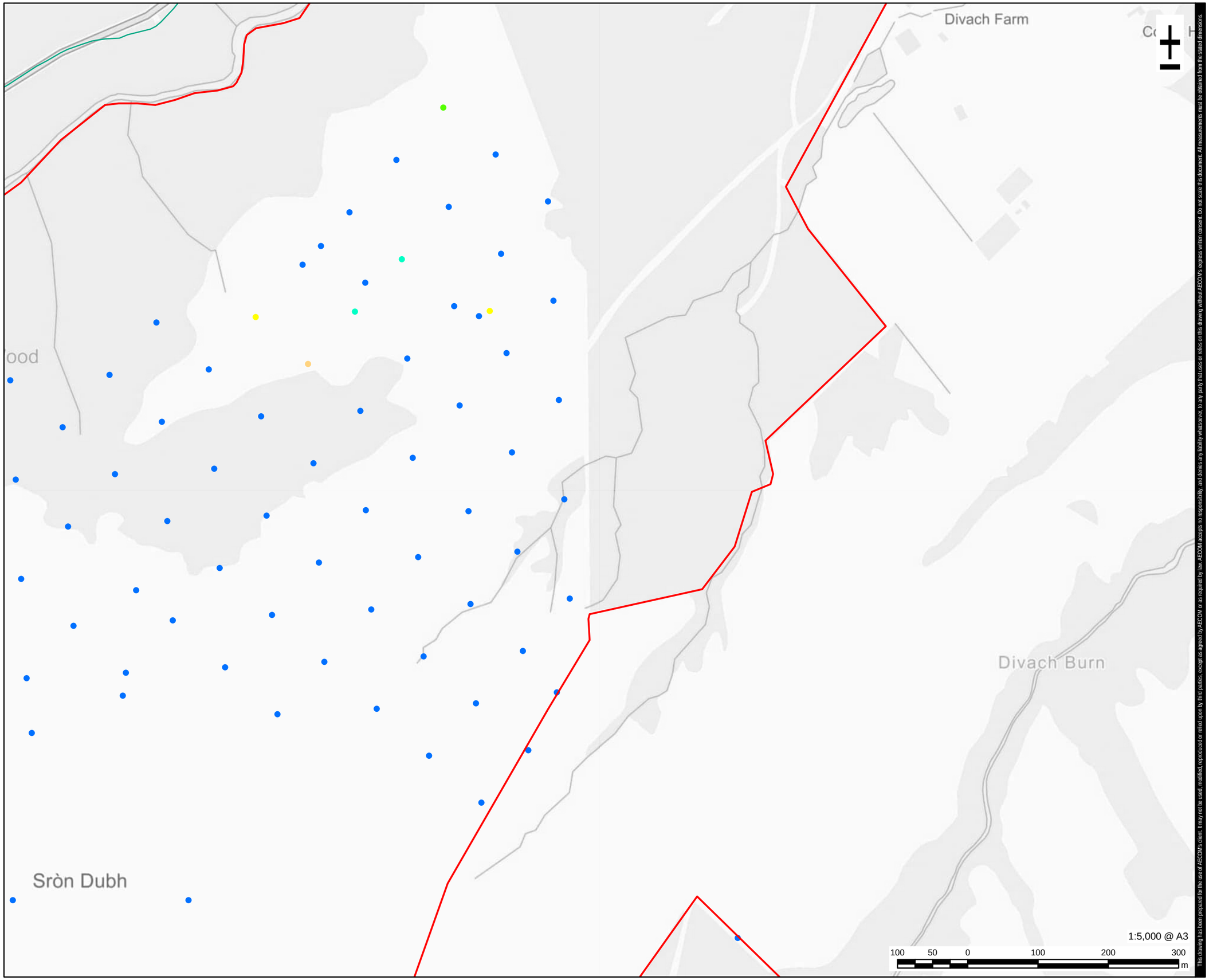

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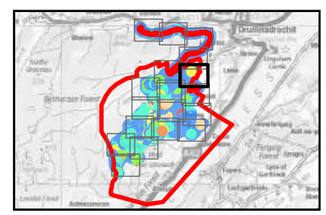
LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Core Path Existing Route

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 2.50



NOTES

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

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PC04 (GIS Switchyard)

TC03

TC06

TC05

Càrn Bàn

TC0

1:5,000 @ A3

100 50 0 100 200 300 m

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LEGEND

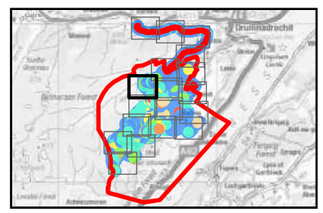
- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile

Access Tracks

- Construction Phase - Permanent
- Construction Phase - Temporary (Construction)
- Pre-Construction Phase - Permanent

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00



NOTES

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

Revision: 0 Drawn: MH Checked: AR Approved: JR Date: 2025-03-27

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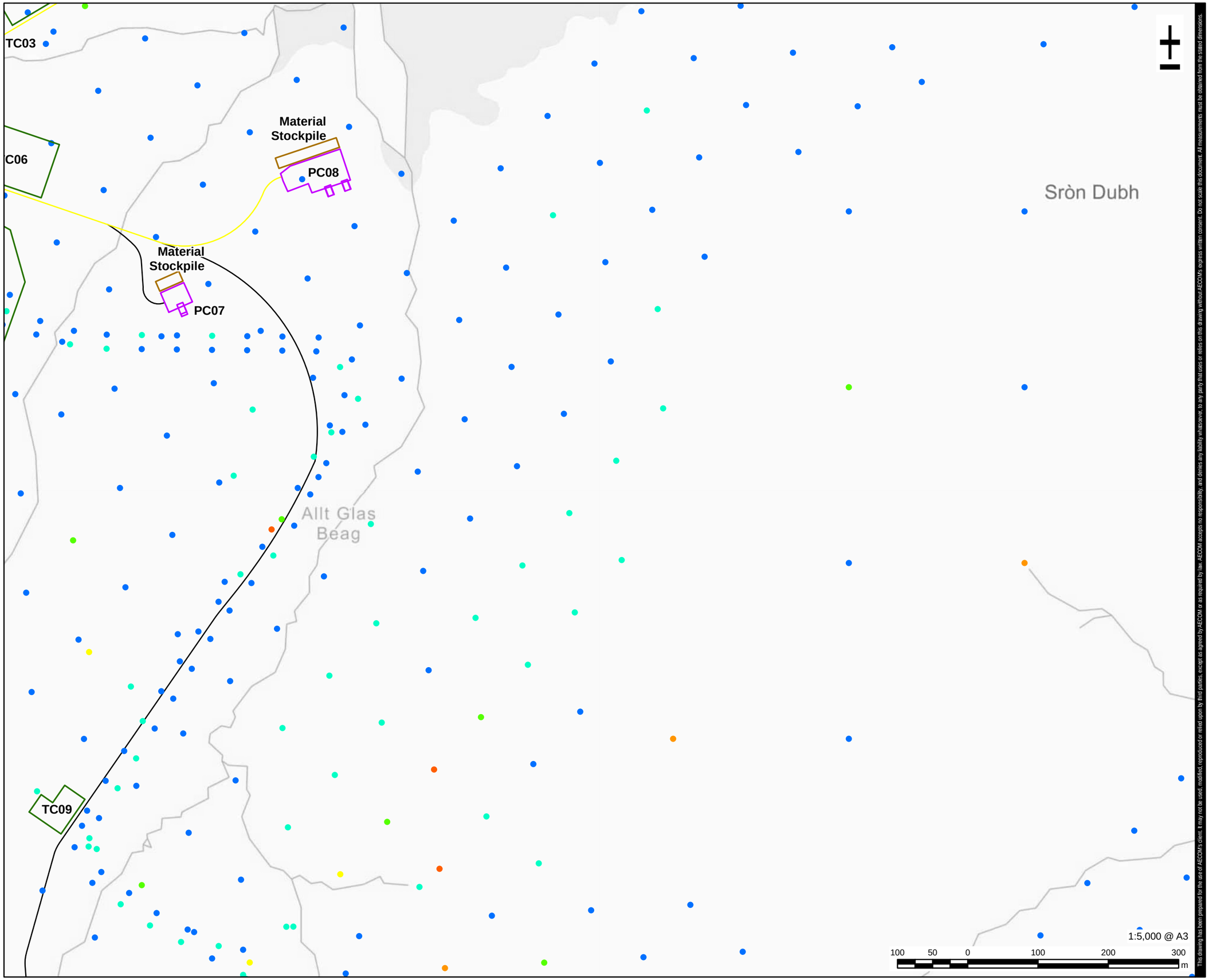

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile

Access Tracks

- Construction Phase - Permanent
- Pre-Construction Phase - Permanent

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.51 - 3.00
- 3.01 - 3.50

NOTES

Below ground infrastructure not assessed as justified within Section 1 of the PLHRA report.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

Revision: 0 Drawn: MH Checked: AR Approved: JR Date: 2025-03-27

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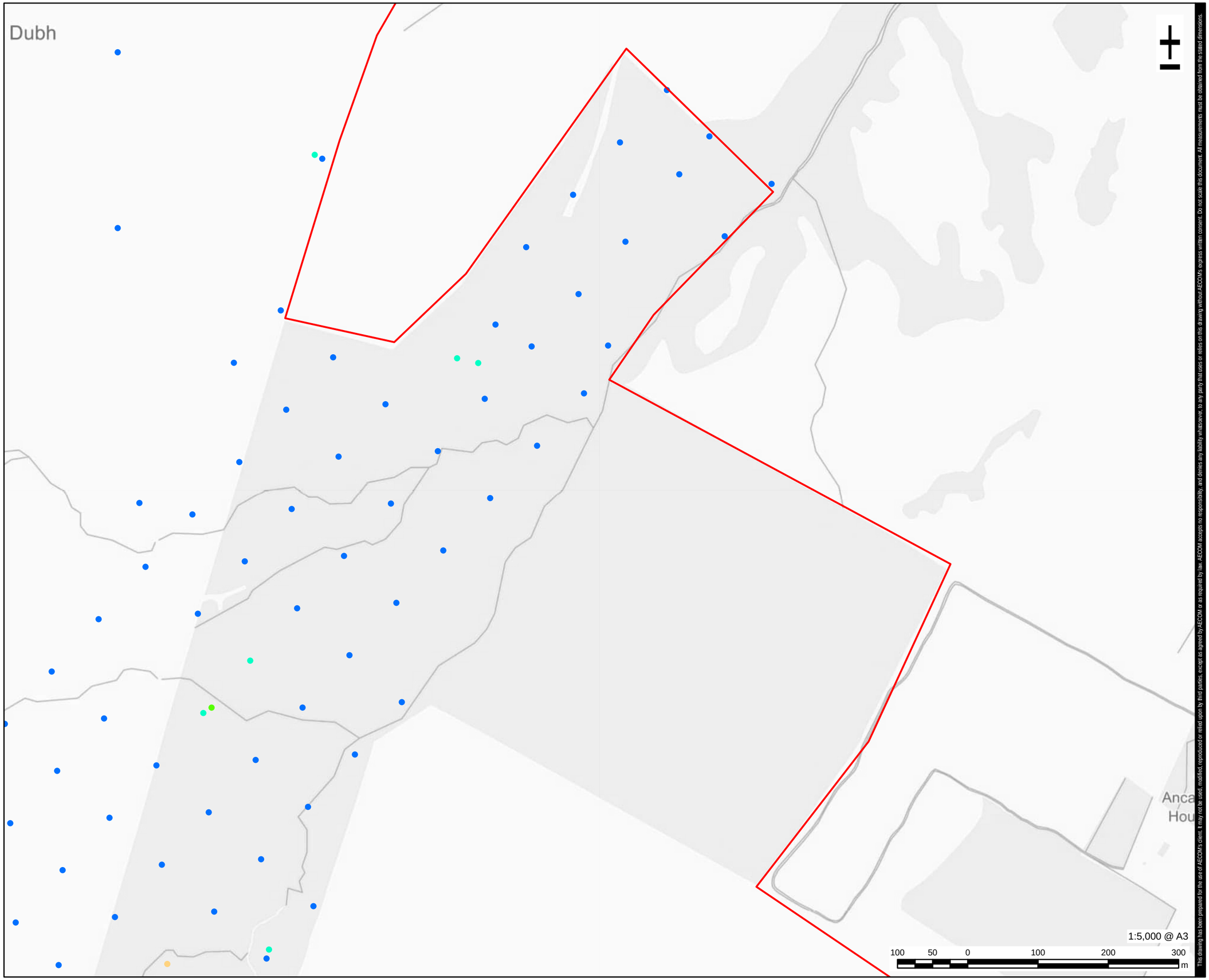

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 2.01 - 2.50

NOTES

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

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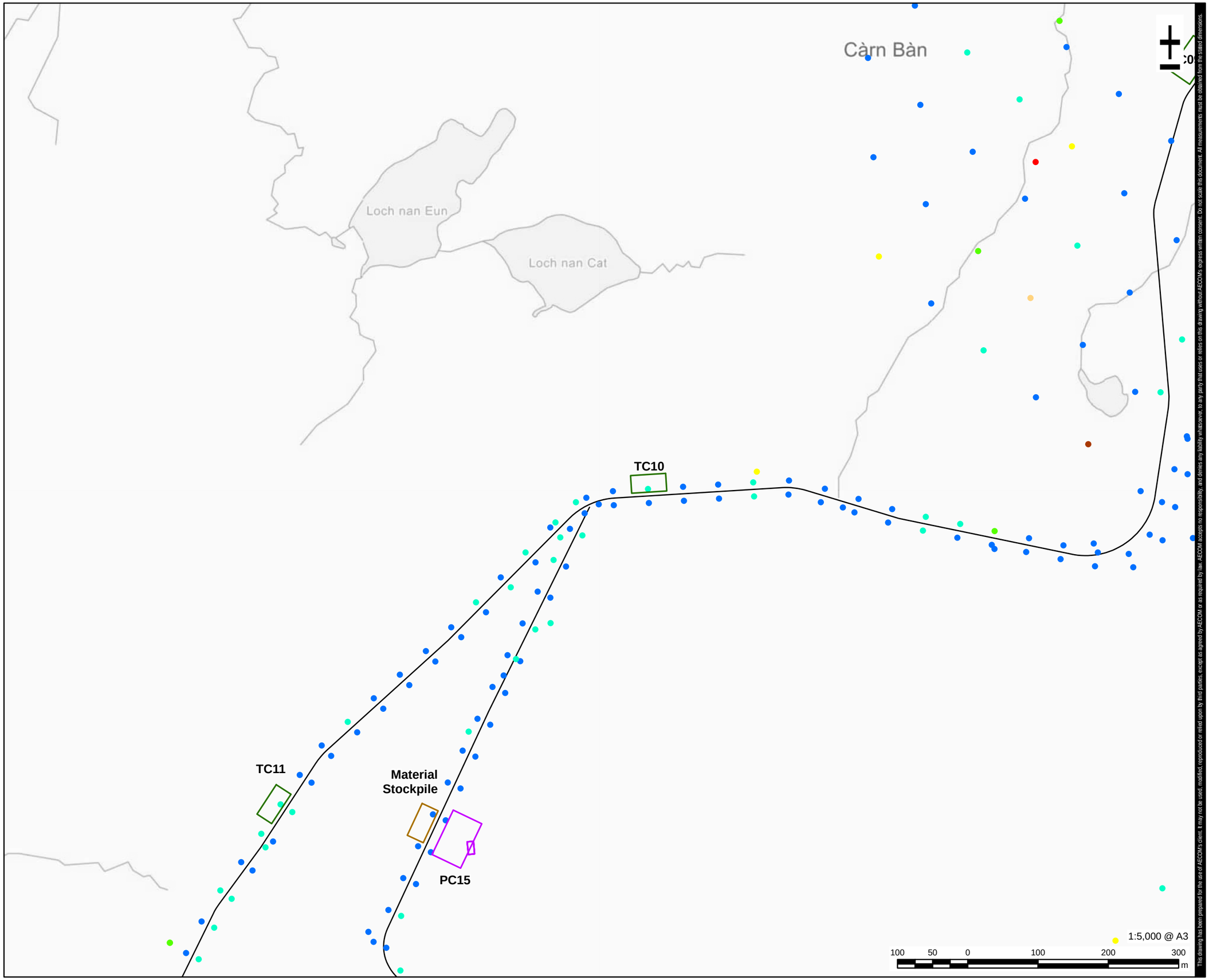

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LEGEND

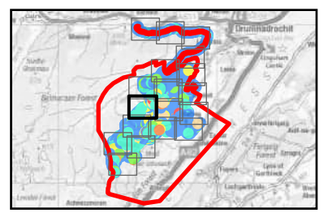
- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile

Access Tracks

- Construction Phase - Permanent

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 2.50
- 3.51 - 4.00
- 4.01 - 4.50



NOTES

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

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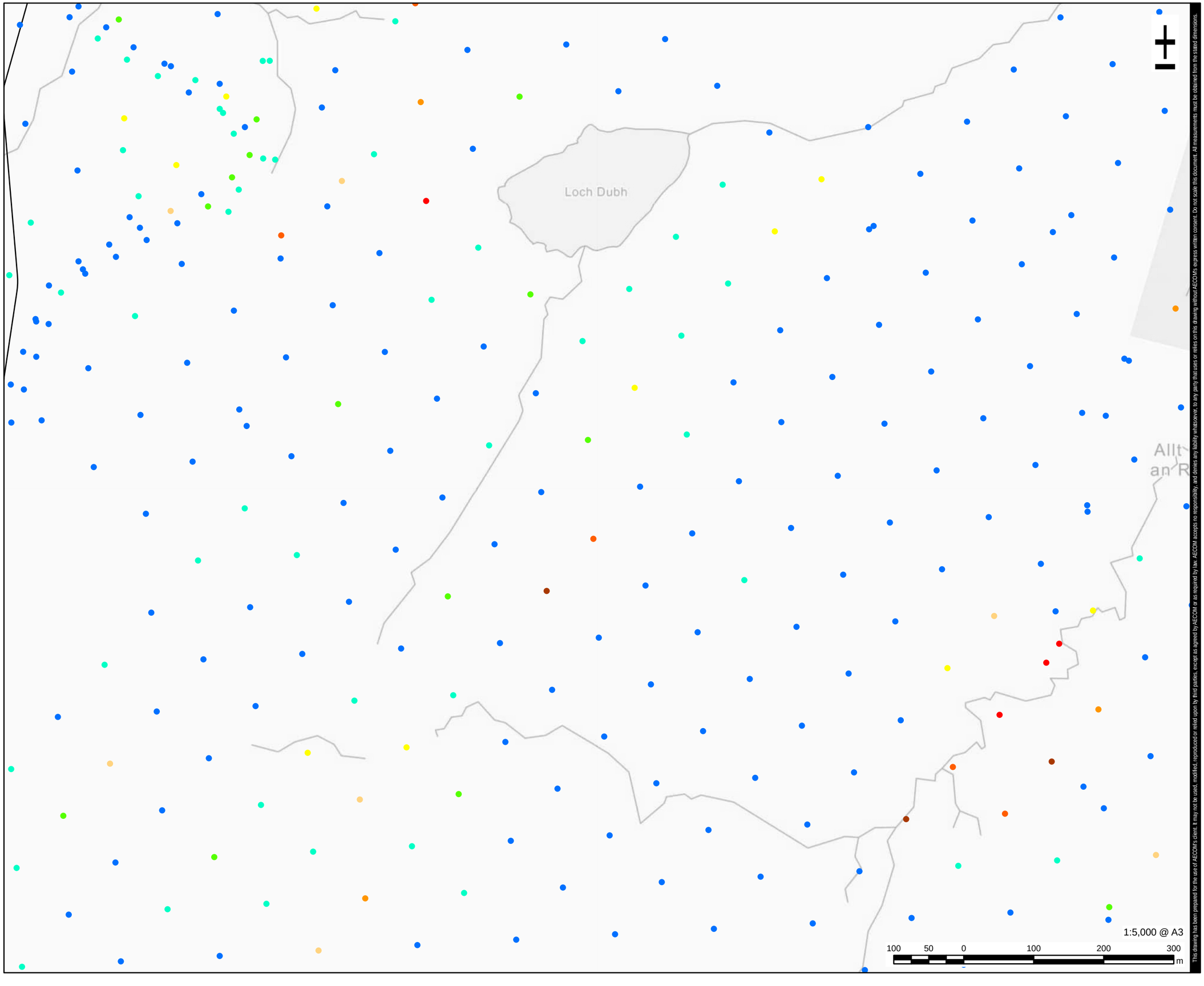

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LEGEND

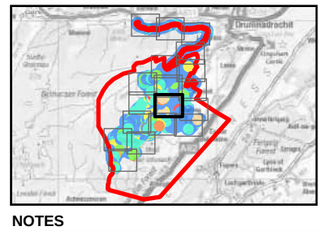
- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile

Access Tracks

- Construction Phase - Permanent

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 2.50
- 2.51 - 3.00
- 3.01 - 3.50
- 3.51 - 4.00
- 4.01 - 4.50



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FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

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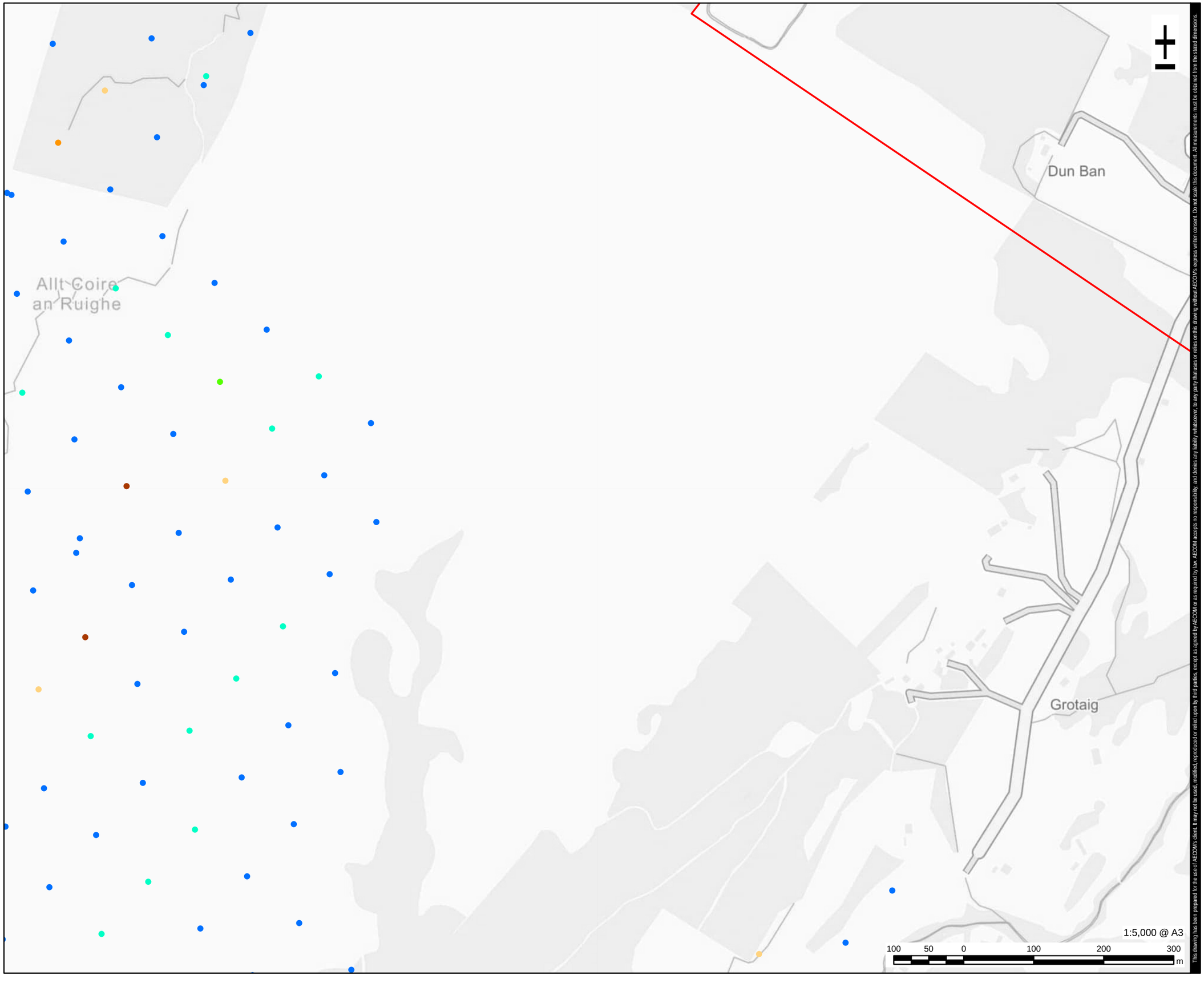

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PROJECT

Glen Earrach Pumped Storage Hydro

CLIENT

Glen Earrach Energy Ltd.

CONSULTANT

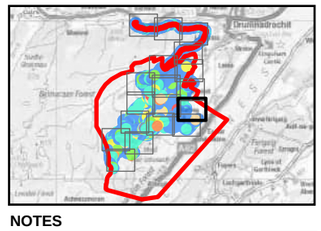
AECOM Limited
1 Tanfield, Inverleith Row
Edinburgh
EH3 5DA
www.aecom.com

LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 2.01 - 2.50
- 2.51 - 3.00
- 4.01 - 4.50



NOTES

Below ground infrastructure not assessed as justified within Section 1 of the PLHRA report.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

Revision: 0 Drawn: MH Checked: AR Approved: JR Date: 2025-03-27

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PC15

TC17

PC14

Saddle Dam 1

Saddle Dam 2

Borrow Pit

Loch nan Oighreagan

1:5,000 @ A3

100 50 0 100 200 300 m

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Upper Control Works

Access Tracks

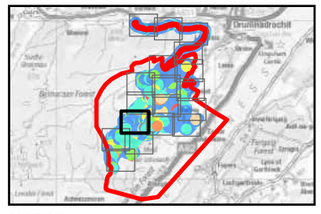
- Construction Phase - Permanent
- Construction Phase - Permanent (Floating)
- Construction Phase - Permanent (Floating Transition)
- Construction Phase - Temporary (Construction)

Headpond

- Dam
- Borrow Pit
- Top Water Level

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 2.50
- 2.51 - 3.00
- 3.01 - 3.50
- 3.51 - 4.00
- 4.01 - 4.50
- 5.01+



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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

Revision: 0 Drawn: MH Checked: AR Approved: JR Date: 2025-03-27

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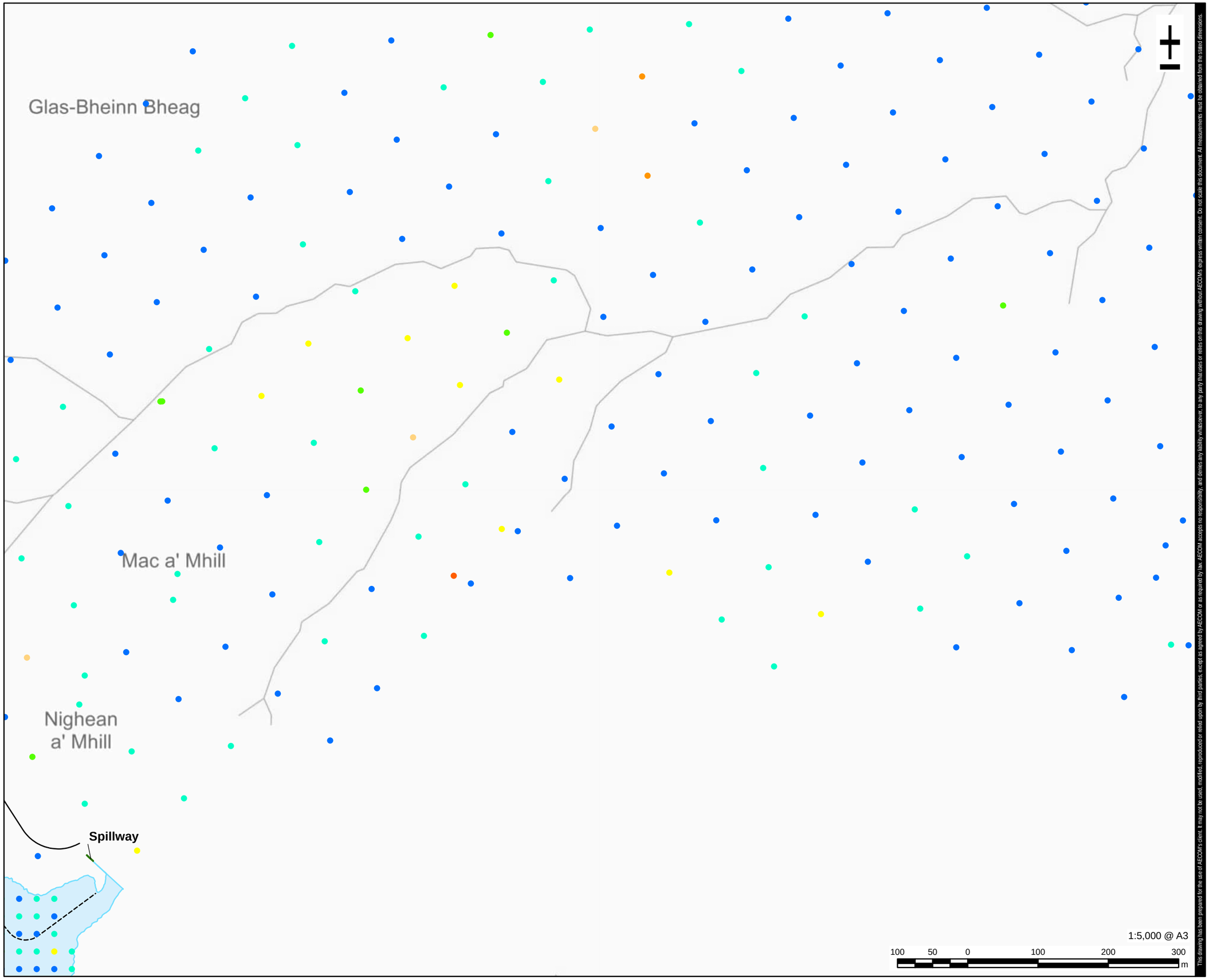

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile

Access Tracks

- Construction Phase - Permanent
- Construction Phase - Temporary (Construction)

Headpond

- Spillway
- Top Water Level

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 2.50
- 2.51 - 3.00
- 3.01 - 3.50

NOTES

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ISSUE PURPOSE

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PROJECT NUMBER

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FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

Revision: 0 Drawn: MH Checked: AR Approved: JR Date: 2025-03-27

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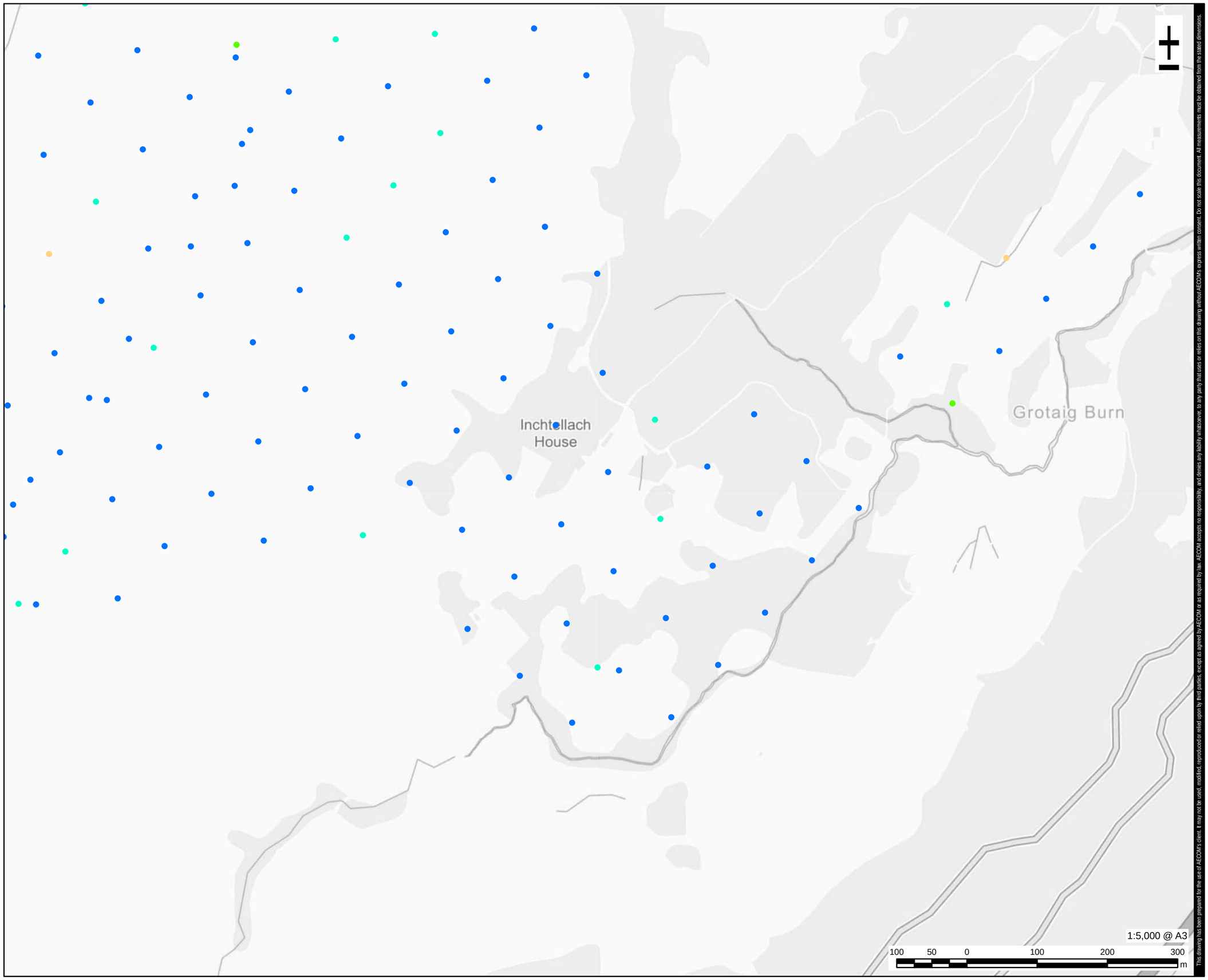

1:5,000 @ A3

100 50 0 100 200 300 m

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 2.01 - 2.50

NOTES

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

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FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

Revision: 0 Drawn: MH Checked: AR Approved: JR Date: 2025-03-27

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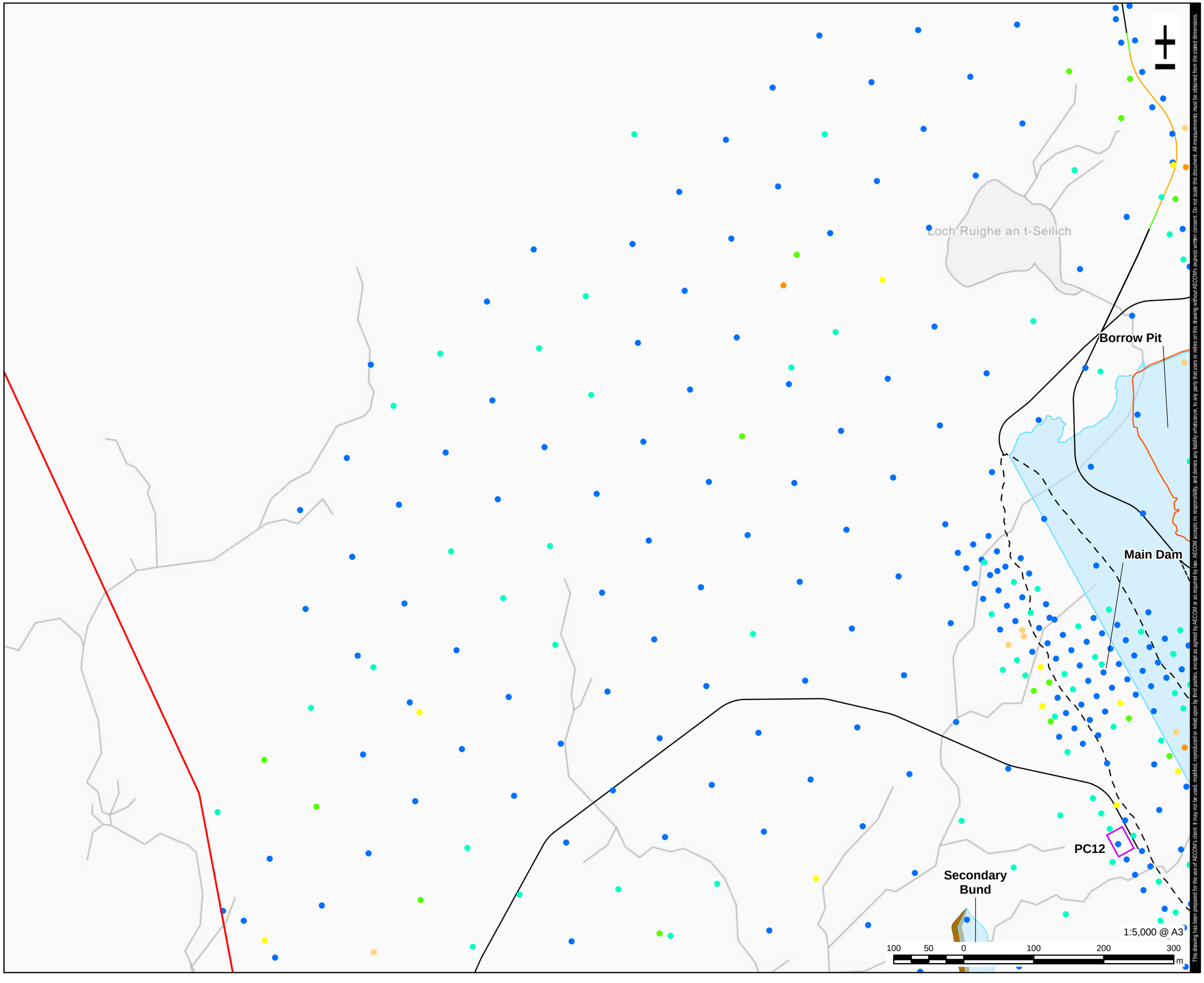

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile

Access Tracks

- Construction Phase - Permanent
- Construction Phase - Permanent (Floating)
- Construction Phase - Permanent (Floating Transition)
- Construction Phase - Temporary (Construction)

Headpond

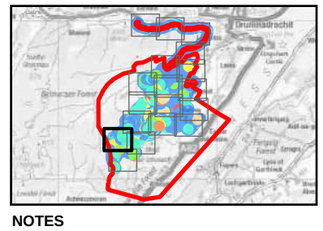
- Dam
- Borrow Pit
- Top Water Level

Secondary Bund

- Dam
- Top Water Level

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 2.50
- 2.51 - 3.00



NOTES

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

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FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

Revision: 0 Drawn: MH Checked: AR Approved: JR Date: 2025-03-27

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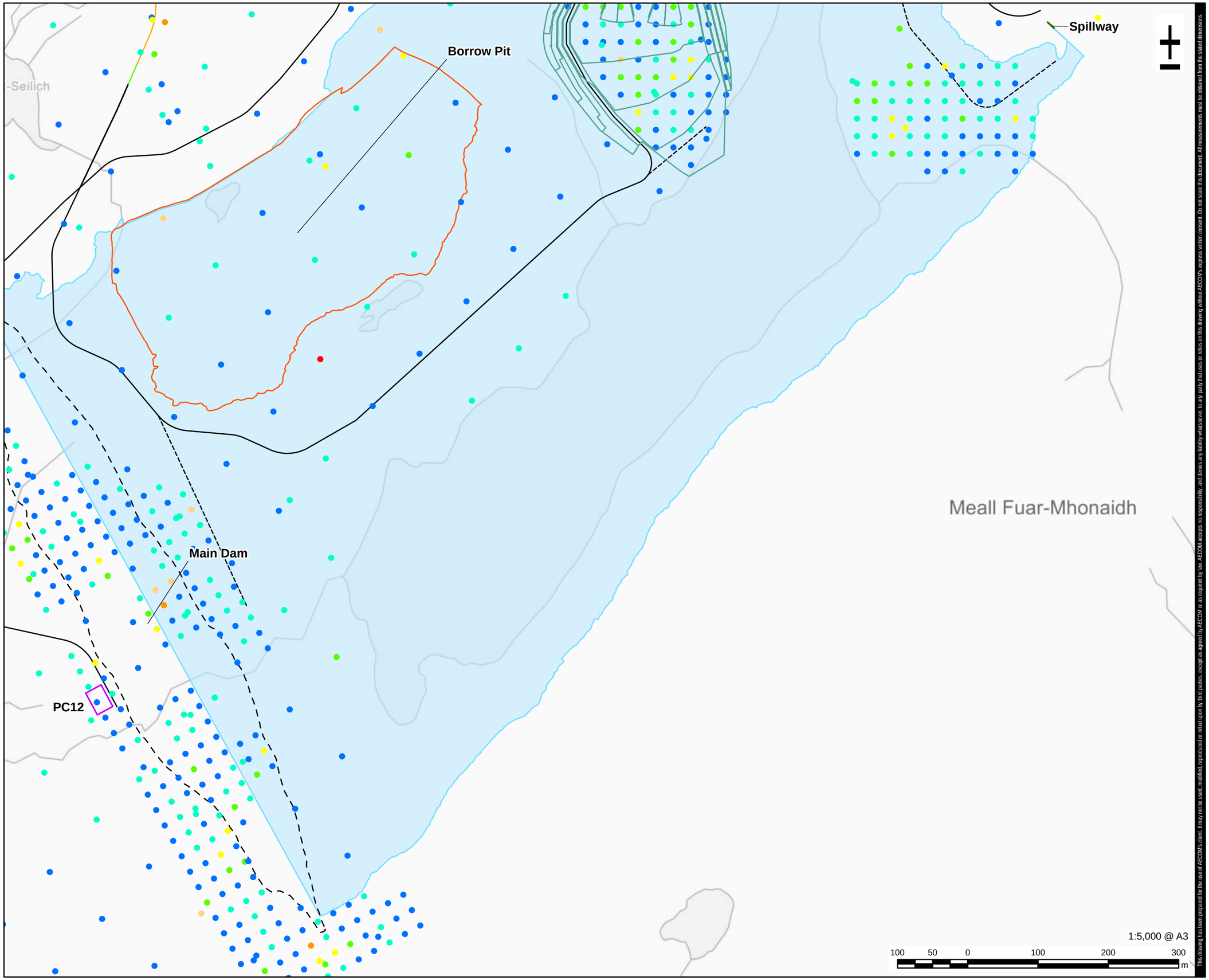

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Upper Control Works

Access Tracks

- Construction Phase - Permanent
- Construction Phase - Permanent (Floating)
- Construction Phase - Permanent (Floating Transition)
- Construction Phase - Temporary (Construction)

Headpond

- Dam
- Spillway
- Borrow Pit
- Top Water Level

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 2.50
- 2.51 - 3.00
- 3.51 - 4.00

NOTES

Below ground infrastructure not assessed as justified within Section 1 of the PLHRA report.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

Revision: 0 Drawn: MH Checked: AR Approved: JR Date: 2025-03-27

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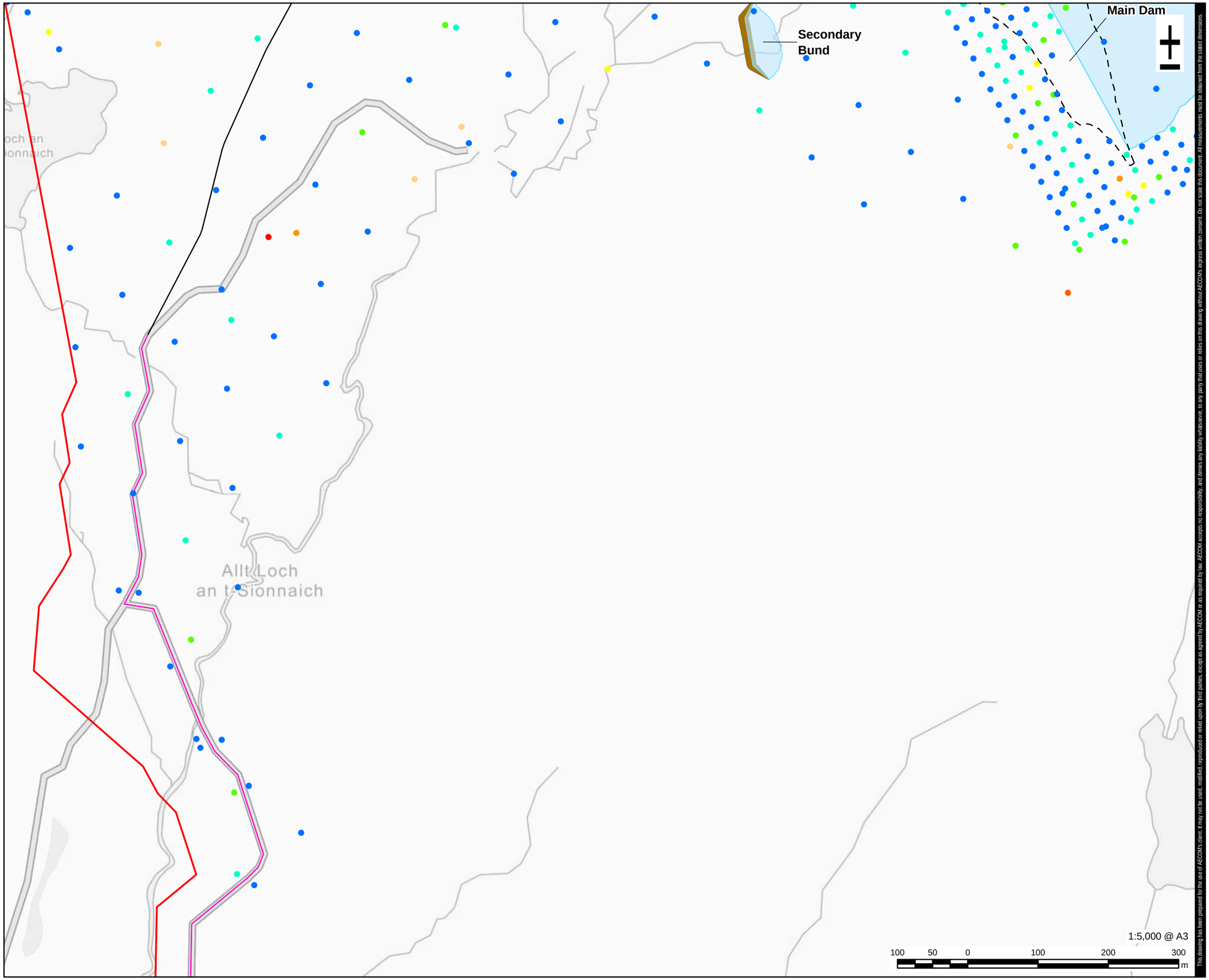

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile

Access Tracks

- Construction Phase - Permanent
- Operation Phase - Existing

Headpond

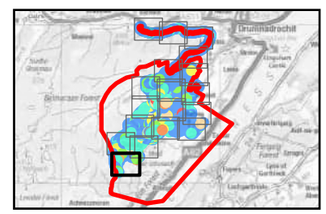
- Dam
- Top Water Level

Secondary Bund

- Dam
- Top Water Level

Peat Probe Location and Depth (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 2.50
- 2.51 - 3.00
- 3.01 - 3.50
- 3.51 - 4.00



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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Peat Probe Survey Results

FIGURE NUMBER

Figure 15.3.8

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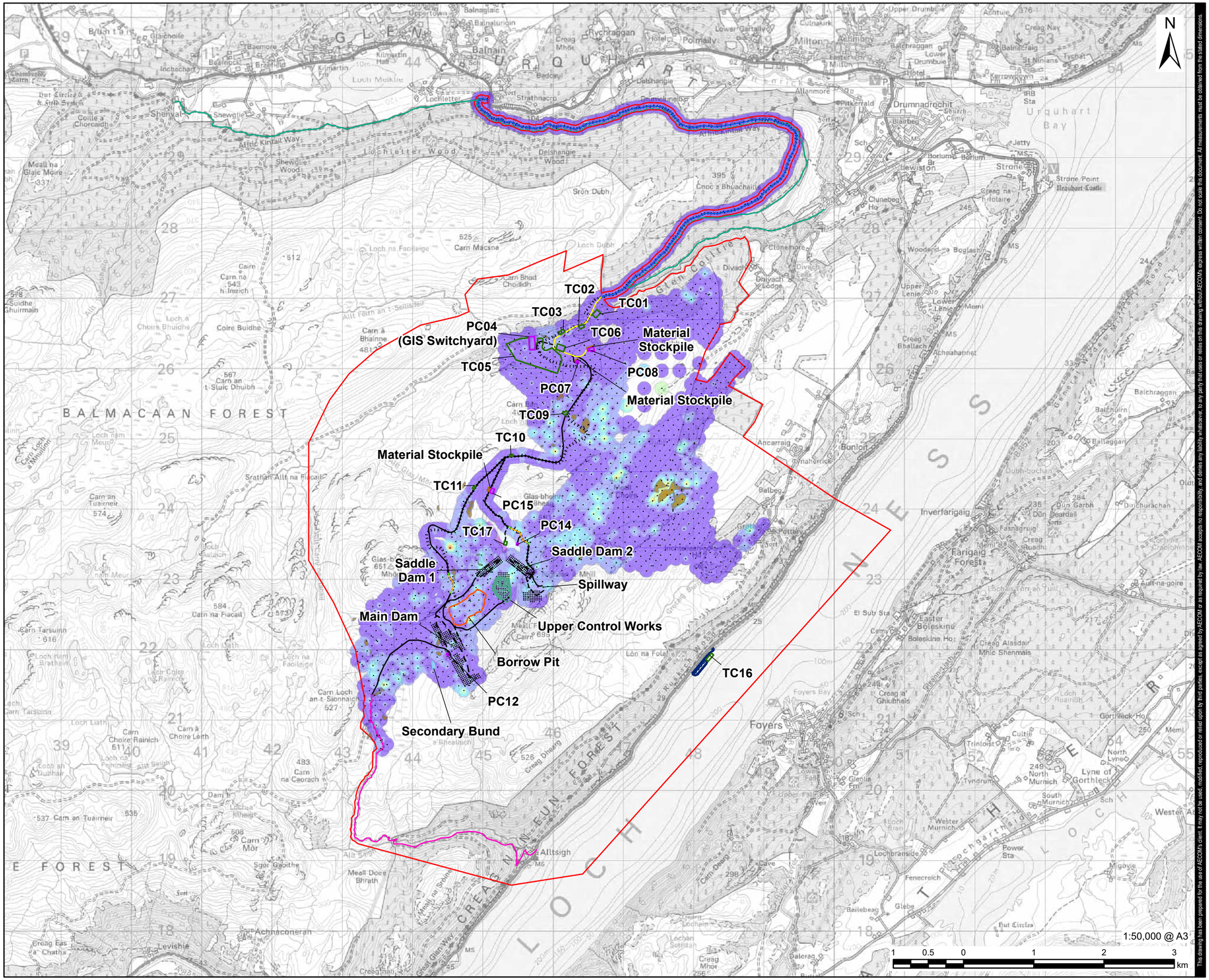

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Glen Earrach Energy Ltd.

CONSULTANT

AECOM Limited
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Edinburgh
EH3 5DA
www.aecom.com

LEGEND

- Red Line Boundary
- Peat Probe Location - Total number of peat probes taken from all surveys to date
- Peatland Action Near Natural Bog
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Upper Control Works
- Lower Control Works
- Core Path Route
- Core Path Route Re-Alignment

Access Tracks

- Construction Phase - Permanent
- Construction Phase - Permanent (Floating)
- Construction Phase - Permanent (Floating Transition)
- Construction Phase - Temporary (Construction)
- Pre-Construction Phase - Existing
- Pre-Construction Phase - Permanent
- Operation Phase - Existing

Headpond

- Dam
- Spillway
- Borrow Pit

Peat Depth Interpolation (m)

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 3.00
- 3.01- 4.00
- 4.01 - 5.00
- 5.01 - 6.00
- 6.01 +

NOTES

The peat depths are based on an interpolated peat surface, based on individual peat probes taken across the site. The results are only indicative and should not be relied upon for detailed design or construction.
Peat Interpolation method used: Inverse Distance Weighting.
Probing Points undertaken:
Phase 1: 1,309; Phase 2: 1,422
Total No. of Probes: 2,731

Below ground infrastructure not assessed as justified within Section 1 of the PLHRA Report.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Peat Depth Interpolation Plan

FIGURE NUMBER

Figure 15.3.9

Revision: 4 Drawn: MH Checked: AR Approved: JR Date: 2025-03-27

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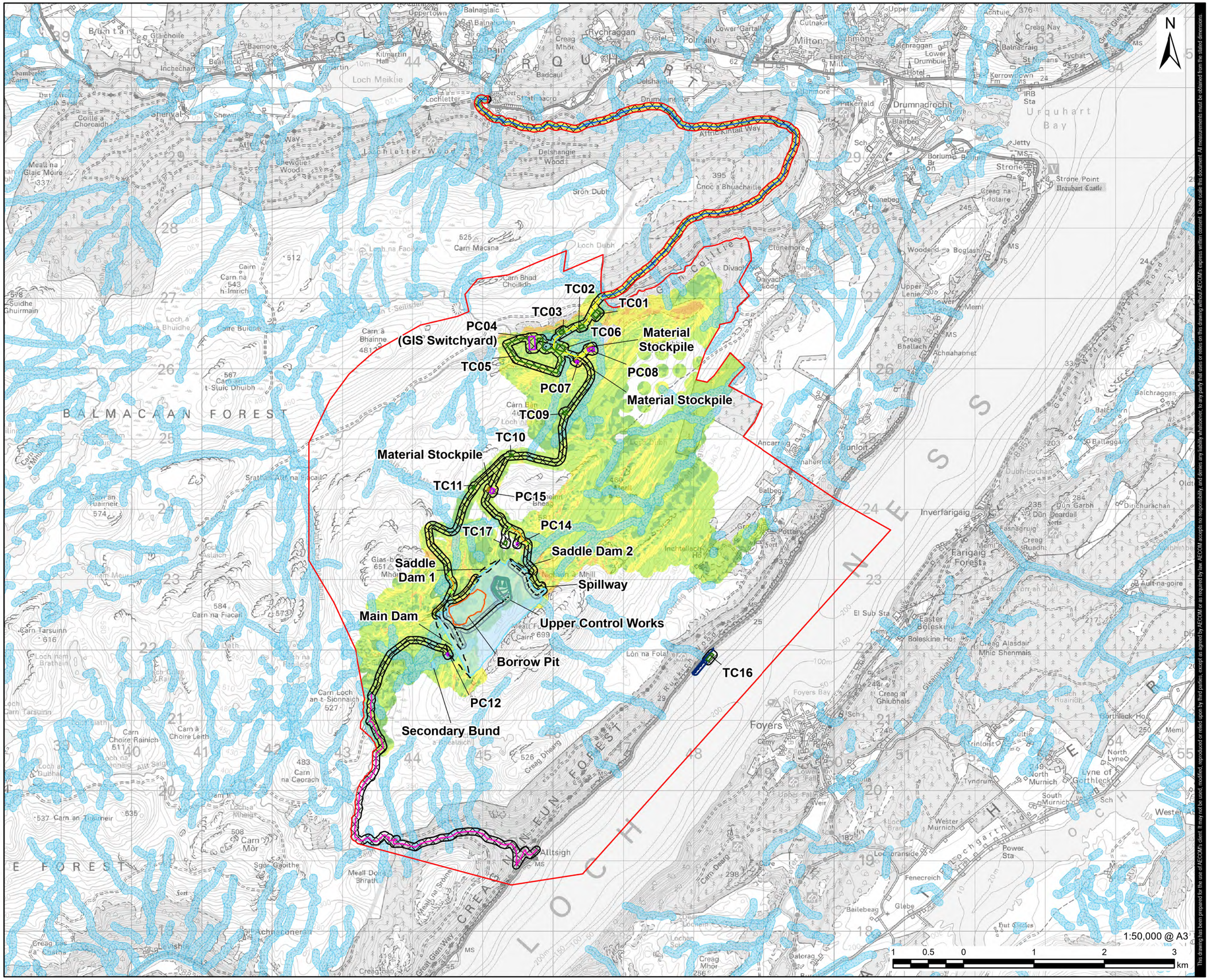

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CLIENT

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CONSULTANT

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www.aecom.com

LEGEND

- Red Line Boundary
- Watercourse - 50 m Buffer
- Permanent Compounds
- Temporary Construction Compounds
- Material Stockpile
- Upper Control Works
- Lower Control Works

Access Tracks

- Construction Phase - Permanent
- Construction Phase - Permanent (Floating)
- Construction Phase - Permanent (Floating Transition)
- Construction Phase - Temporary (Construction)
- Pre-Construction Phase - Existing
- Pre-Construction Phase - Permanent
- Operation Phase - Existing

Headpond

- Dam
- Spillway
- Borrow Pit
- Top Water Level

Peat Slide Assessed Hazard

- Negligible
- Unlikely
- Likely
- Probable
- Almost certain

NOTES

The peat depths are based on an interpolated peat surface, based on individual peat probes taken across the site. The results are only indicative and should not be relied upon for detailed design or construction.

Peat Interpolation method used: Inverse Distance Weighting

Below ground infrastructure not assessed as justified within Section 1 of the PLHRA Report.

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Preliminary Peat Landslide Hazard and Risk Assessment

FIGURE NUMBER

Figure 15.3.10

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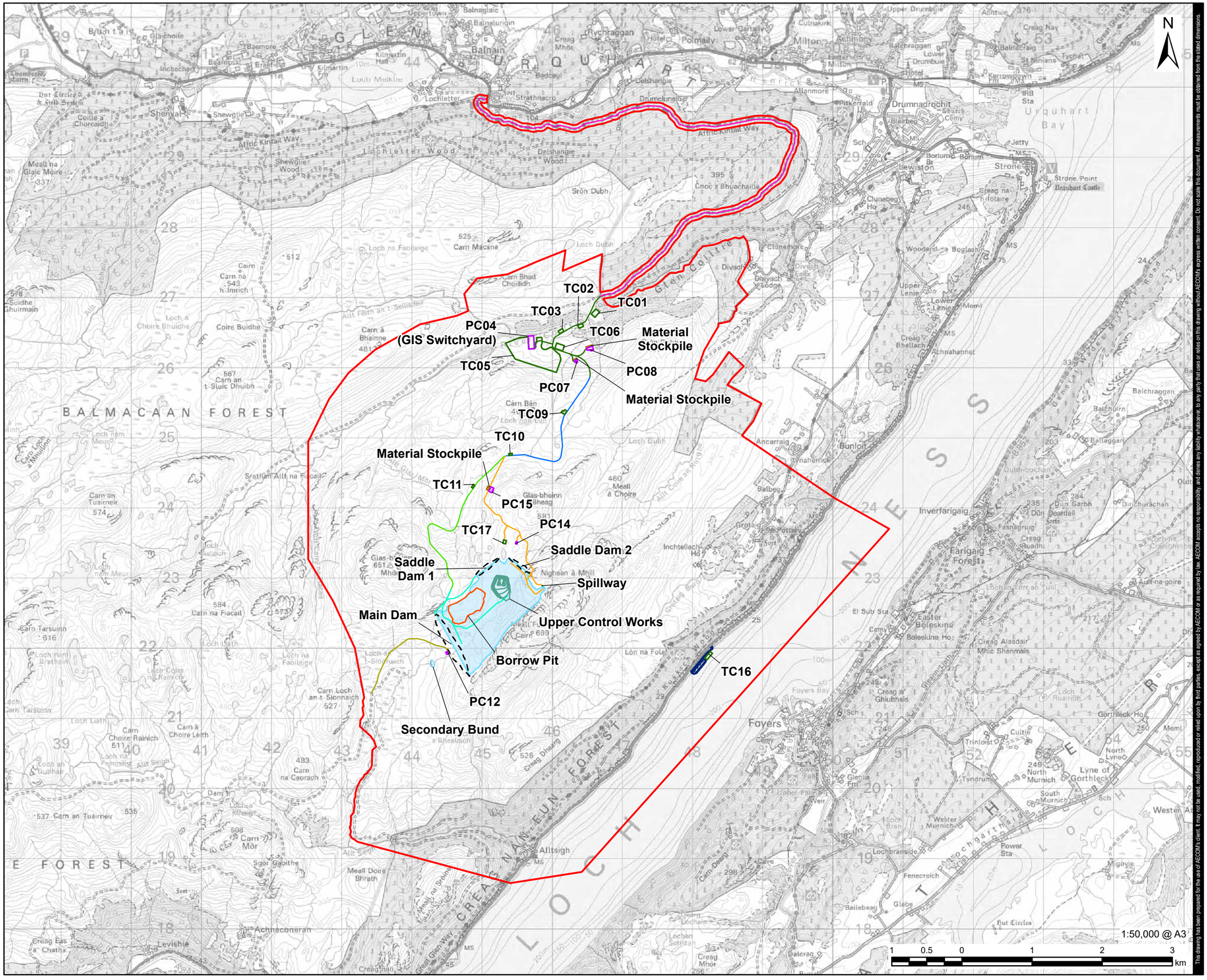

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LEGEND

- Red Line Boundary
- Permanent Compounds
- Material Stockpile
- Temporary Construction Compounds
- Upper Control Works
- Lower Control Works

Headpond

- Dam
- Spillway
- Borrow Pit
- Top Water Level

Access Track Sections

- Section 1
- Section 2
- Section 3
- Section 4
- Section 5
- Section 6
- Section 7

NOTES

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ISSUE PURPOSE

FINAL

PROJECT NUMBER

60719875

FIGURE TITLE

Access Track Sections

FIGURE NUMBER

Figure 15.3.11

Glen Earrach AECOM