PREPARED FOR

Scottish & Southern Electricity Networks
TRANSMISSION

Carnaig Substation EIA

Technical Appendix 10.2: Peat Management Plan

DATE
September 2024

REFERENCE
0699566

DOCUMENT DETAILS

The details entered below are automatically shown on the cover and the main page footer. PLEASE NOTE: This table must NOT be removed from this document.	
DOCUMENT TITLE	Carnaig Substation EIA
DOCUMENT SUBTITLE	Technical Appendix 10.2: outline Peat Management Plan
PROJECT NUMBER	0699566
DATE	September 2024
VERSION (delete field if unneeded)	01
AUTHOR	Mine van der Berg
CLIENT NAME	SSEN

DOCUMENT HISTORY

				ERM APPROVAL TO ISSUE		
VERSION	REVISION	AUTHOR	REVIEWED BY	NAME	DATE	COMMENTS
01	000	Mine van der Berg	Gregor Hirst	Tomos Ap Tomos	12 July 2024	
02	1	Gregor Hirst	Tomos Ap Tomos	Tomos Ap Tomos	26 September 2024	
03		Gregor Hirst	Tomos Ap Tomos	Tomos Ap Tomos	25 October 2024	

CONTENTS

LIST OF TABLES

LIST OF FIGURES

NO TABLE OF FIGURES ENTRIES FOUND.

ACRONYMS AND ABBREVIATIONS

Acronym	Description
ECoW	Ecological Clerk of Works
ECU	Energy Consent Unit
EIAR	Environmental Impact Assessment Report
ERM	Environmental Resources Management Ltd
GWDTEs	Ground Water Dependent Terrestrial Ecosystems
oPMP	Outline Peat Management Plan
OSNGR	Ordnance Survey National Grid Reference
PSRA	Peat Slide Risk Assessment
SEPA	Scottish Environment Protection Agency
SR	Scottish Renewables
THC	The Highland Council

1. INTRODUCTION

1.1 BACKGROUND

This outline Peat Management Plan (oPMP) has been prepared by Environmental Resources Management Ltd (ERM) to assess the estimated peat excavation and re-use potential as well as the proposed peat and soil management methodologies to be employed during the construction of the Carnaig Substation (the Proposed Development).

The oPMP has been prepared as a technical appendix to an Environmental Impact Assessment Report (EIA Report) and should be read in conjunction with Chapter 10: Geology, Soils and Peat of the EIA Report. The oPMP will ensure that the construction of the Proposed Development will comply with good practice in accordance with Scottish Renewables (SR) and Scottish Environment Protection Agency (SEPA) guidance[1].

The purpose of the oPMP is to:

- Define and quantify the materials that will be excavated during the construction of the Development, focussing specifically on the excavation of peat;
- Report on detailed investigations into peat depths during within the Proposed Development, including peat probing and scoring results;
- Detail proposals for the management of excavated peat and other soils;
- Consider the potential effect of the Proposed Development on Ground Water Dependent Terrestrial Ecosystems (GWDTEs);
- Determine volumes of excavated peat at the Site and proposals for re-use or reinstatement using excavated materials;
- Assess the potential for peatland restoration at the Site, and;
- Provide details of general and specific mitigation measures.

The oPMP has been produced in accordance with SR and SEPA guidance on peat excavations and management. It is expected that this document will evolve throughout the different phases of the Proposed Development and will therefore be subject to continued review to address:

- Requirements to adhere to future planning conditions;
- Detailed ground investigations and design development;
- Unforeseen conditions encountered during construction;
- Changes in best practice during the construction phase, and;
- Changes resulting from the construction methods used by the contractor(s).

Whilst this oPMP provides a base standard for good practice, the contractor will implement any methods or improvements to current practices which will avoid or minimise risks to the environment, where possible, and will correspond with SR and SEPA guidance.

The oPMP is accompanied by the following appendices:

- Appendix A – Figures, and;

[1] Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only (Accessed 04/07/2024).

- Appendix B – Excavation and Re-use Volumes and Calculations.

1.2 THE SITE

The Site is located on the north-western slope of Meall Mòr, adjacent to the south-western boundary of the existing 275 kV Loch Buidhe Substation. Access to the existing 275 kV Loch Buidhe Substation is taken off Lochbuie Road, to the north-west of the Site. The Site lies approximately 9.5km to the north-east of Bonar Bridge, within The Highland Council (THC) area, centred on Ordnance Survey National Grid Reference (OSNGR) 265194 E, 897429 N.

Currently, the Site predominantly comprises commercial forestry, of which a significant proportion has been felled. There are several minor watercourses present within the Site boundary, including Alltan Dubh which runs in a north-westerly direction towards Allt Garbh-airigh in the north west of the Site, Allt Glach-bhuaile is present in the east of the Site running east then north into Loch Buidhe. Allt na Sean-airigh is present in the south eastern section of the Site, running south into Loch an Lagain, while Allt an t-Sleasdairigh is present in the south western extent of the Site, also running south into Loch an Lagain.

Existing ground levels at the Site comprise an overall fall from approximately 230 m Above Ordnance Datum (AOD) in the south-east to approximately 200 m AOD in north-west adjacent to the existing 275 kV Loch Buidhe Substation access track.

1.3 THE PROPOSED DEVELOPMENT

The Proposed Development consists of the following main components:

- Three new bellmouths and access road to the Proposed Development from the public highway;
- A temporary construction compound;
- Drainage and associated Sustainable Drainage System (SuDS) retention basins;
- A new level platform (approximately 620 metre (m) by 320 m) to be delivered through cut and fill earthworks. An outdoor Air Insulated Substation (AIS), 400 kV substation complete with 400 kV double busbar arrangement;
- Installation of two new Super Grid Transformers (SGTs) and other associated equipment;
- A new substation control building (approximately 20 m by 48 m);
- Erection of a 2.4 m high palisade security fencing with a 1.6 m electrified anti-climbing extension security fence around the perimeter of the platform;
- Post construction mitigation measures including peatland restoration and landscape mitigation planting; and
- Biodiversity enhancement works including native species planting and habitat creation.
- Erection of a deer fence around the perimeter of landscape planting and peatland restoration areas.

1.4 CONSULTATION

Peat excavation and disturbance within the Site, as well as the reinstatement and restoration potential, were considered throughout the EIA for the Proposed Development and the

outcomes of studies are reported in the EIA Report. The EIA Report forms part of the planning application submitted to The Highland Council (THC) and made available to all consultees, including SEPA.

2. OBJECTIVES

2.1 INTRODUCTION

Desk-based assessments, detailed peat survey work and completion of technical assessments such as the Peat Slide Risk Assessment (PSRA) for the EIA Report allows a consistent approach for managing peat.

In addition to the technical assessments, an outline civil design of the Site has been undertaken. The overall objective in the design of the Proposed Development has been to minimise the excavation and disturbance of peat where possible. Chapter 3: Site Selection Process and Alternatives details the design process and how peat was avoided in the Proposed Development.

The objective of the oPMP is achieved by:

- Ensuring the characteristics of the Site are understood through extensive peat probing and assessing the Site topography;
- Understanding the Site layout and how peat will be excavated and stored;
- Modelling the peat depth profile based on probing and a digital terrain modelling in 3D;
- Considering the best practice guidance for peat reinstatement, and;
- Developing practical peat restoration opportunities for the improvement of habitats and peatlands.

The oPMP has been compiled in accordance with the following best practice guidance:

- Guidance on Developments on Peatland: Peatland Survey (2017)[2];
- Guidance on Developments on Peatland: Guidance on the Assessment of Peat Volumes, Re-use of Excavated Peat and Minimisation of Waste[3];
- Floating Roads on Peat Guidance[4];
- Good Practice During Wind Farm Construction[5]; and
- SEPA Regulatory Position Statement – Developments on Peat[6].

[2] SNH (2017) Guidance on Developments on Peatland: Peatland Survey (2017) [Online] Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2018/12/peatland-survey-guidance/documents/peatland-survey-guidance-2017/peatland-survey-guidance-2017/govscot%3Adocument/Guidance%2Bon%2Bdevelopments%2Bon%2Bpeatland%2B-%2Bpeatland%2Bsurvey%2B-%2B2017.pdf (Accessed 28/06/2024)

[3] •Scottish Renewables SEPA 2012 Guidance on Developments on Peatland: Guidance on the Assessment of Peat Volumes, Re-use of Excavated Peat and Minimisation of Waste https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2014/07/assessment-of-peat-volumes-reuse-of-excavated-peat-and-minimisation-of-waste-guidance/documents/guidance-on-the-assessment-of-peat-volumes-reuse-of-excavated-peat-and-the-minimisation-of-waste/guidance-on-the-assessment-of-peat-volumes-reuse-of-excavated-peat-and-the-minimisation-of-waste/govscot%3Adocument/Guidance%2Bon%2Bthe%2Bassessment%2Bof%2Bpeat%2Bvolumes%252C%2Breuse%2Bof%2Bexcavated%2Bpeat%252C%2Band%2Bthe%2Bminimisation%2Bof%2Bwaste.pdf (Accessed 288/06/2024).

[4] SNH (2010) Floating Roads on Peat [Online] Available at: http://www.roadex.org/wp-content/uploads/2014/01/FCE-SNH-Floating-Roads-on-Peat-report.pdf (Accessed 28/06/2024)

[5] Scottish Renewables et al. (2019) Good Practice during Wind Farm Construction [Online] Available at: Guidance - Good practice during Wind Farm construction | NatureScot (Accessed 28/06/2024)

[6] SEPA (2010) SEPA Regulatory Position Statement – Developments on Peat [Online] Available at: https://www.sepa.org.uk/media/143822/peat_position_statement.pdf (Accessed 28/06/2024)

2.2 APPROACH TO MINIMISING PEAT EXCAVATION

Existing topography drives the design of the SSEN infrastructure with due consideration given to potential construction risk and effects on environmentally sensitive receptors including deep peat, watercourse buffers and any GWDTEs. Further micro-siting post consent would take place in such a way to avoid where possible the excavation of deep peat.

The following steps have been taken during the outline design stage of the Proposed Development to minimise the effect on peat:

- The development of an infrastructure design which avoids deeper peat where practicable;
- The development of an access track design that uses existing tracks where possible, where gradients permit;
- The design and orientation of the substation considers local topography, peat depth and other environmental constraints;
- Designing cable alignments to avoid areas of deep peat; and
- Consideration of a borrow pit location in an area of shallow peat.

These steps will be further supplemented by taking the following measures to minimise disturbance:

- Maximisation of batter angles in cuttings; and;
- The use of appropriate construction plant to avoid unnecessary disturbance of the ground surface (e.g. low ground pressure excavators).

The oPMP is based upon the fundamental principle that achieving a successful materials strategy is contingent on gaining a thorough understanding of the Site through investigation and developing a design that achieves the materials management objectives. For the Proposed Development, this principle is achieved by undertaking significant peat probing and ground investigations (GI) prior to preparing the outline civil design layout in 3D and the preparation of this oPMP based on the available information.

2.3 AIMS AND OBJECTIVES

2.3.1 NEED FOR A PEAT MANAGEMENT PLAN

Peatlands are considered to be a significant natural resource due to the wildlife habitats that they provide and their ability to absorb carbon, as such they are protected by various legislation, policy and local, national and international initiatives such as:

- United Kingdom Biodiversity Action Plan (UKBAP)[7];
- Scotland's National Peatland Plan (2015)[8];
- Scottish Biodiversity List (SBL)[9];

[7] Joint Nature Conservation Committee: UKBAP [online] Available at: https://jncc.gov.uk/our-work/uk-bap/ (Accessed 28/06/2024).
[8] NatureScot - Scotland's National Peatland Plan: Working for our future [online] Available at: https://www.nature.scot/doc/scotlands-national-peatland-plan-working-our-future (Accessed 28/06/2024)
[9] NatureScot – Scottish Biodiversity List [online] Available at: https://www.nature.scot/doc/scottish-biodiversity-list (Accessed 28/06/2024)

- Scotland's 2018-2032 Climate Change Plan[10], and;
- Scottish Soil Framework (2009)[11].

SEPA has a statutory duty to ensure that where peat spoil is generated during construction, it is stored, re-used, treated or disposed of correctly, which may require authorisation or permits.

SEPA's policy on the management of peat is set out in their SEPA Regulatory Position Statement – Developments on Peat. This highlights that the best management option for peat spoil is the prevention of its production, by seeking to minimise peat excavation and disturbance. Where this is unavoidable, developers should attempt to re-use as much of the peat produced on-site as possible, in justifiable and environmentally beneficial ways.

The oPMP is prepared to demonstrate to local authorities, SEPA and other consultees that the construction of the Proposed Development will progress in a manner that is planned, in accordance with good practice and achieves the aim of being environmentally sustainable.

Therefore, the oPMP is prepared in accordance with the SR and SEPA guidance. It details how:

- The Proposed Development has been structured and designed to reduce the volumes of peat excavated as far as is reasonably practicable;
- Volumes of peat excavated during construction have been considered in the design, and;
- Excavated peat will be managed appropriately.

2.3.2 OBJECTIVES OF THE OPMP

The main objective of the oPMP is to outline how peat and peaty soils proposed to be excavated will be managed and re-used during the construction of the Propsoed Development and proposed restoration plans.

This is achieved through responding of the following objectives:

- Providing details of the extent and depth of the peat on Site and how this was determined;
- Estimation of peat volumes to be excavated and re-used;
- Classification of excavated materials;
- Consideration of the use of appropriate construction methods;
- Describing how excavated peat will be handled to ensure suitability for re-use;
- Determining if temporary storage of peat will be required during construction and how this will be done to ensure suitability for re-use, and;
- Considering the potential volume of peat which may not be suitable for re-use and any requirement for a Waste Management Plan for the Proposed Development.

The response to these objectives is provided within the following sections.

[10] Scottish Government – "Securing a green recovery on a path to net zero: climate change plan 2018–2032 – update" [online] Available at: https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/pages/12/ (Accessed 28/06/2024)
[11] Scottish Government – "The Scottish Soil Framework" [online] Available at: https://www.gov.scot/publications/scottish-soil-framework/ (Accessed 28/06/2024).

3. PEAT INVESTIGATIONS, EXCAVATIONS, RE-USE AND MANAGEMENT

3.1 PEAT CLASSIFICATION AND PUBLISHED GEOLOGY

3.1.1 GENERAL PEAT CLASSIFICATION

Acrotelmic peat is the upper layer of peat consisting of living and partially decayed materials with a higher hydraulic conductivity and a variable water table. These deposits are generally found to exist in the upper 0.5 m of peat deposits and are typically suitable for reinstatement because they contain viable plant life to assist in the regeneration of peatland vegetation and carbon sequestration.

Catotelmic peat is variable in characteristic, with decomposition of fibres generally increasing with depth. Water content can be highly variable and affects the structural strength of the material. Suitability for re-use generally depends on fibre and water content. The upper catotelm is commonly deemed as being appropriate for use in restoration due to its relatively high fibre content.

Generally, excavated semi fibrous catotelmic peat from the Site will have sufficient structural strength to be able to be used in the lower layers of verge restoration as it will not be 'fluid'.

The catotelmic peat would be capped with a surface layer of acrotelm to re-establish the peat vegetation. If any fluid like wet catotelmic peat is encountered then it would be placed in more appropriate locations such as low-lying sections of the borrow pits or concave deposition areas.

The following assumptions have been made in classifying peat excavated during the construction work:

- Where the total peat depth was found to be less than 0.5 m, this peat material is assumed to be 100% acrotelmic;
- Where the total peat depth is between 0.5 m and 1.0 m, the upper acrotelmic peat is at least 0.5 m deep; and
- Where the total peat depth is found to be greater than 1.0 m, acrotelmic peat is assumed to account for at least 30% of total depth but generally applying a minimum of 0.5 m thick.

Existing topography and permitted track gradients drive the design of the infrastructure with due consideration given to potential construction risk and effects on environmentally sensitive receptors including deep peat, watercourse buffers and any GWDTEs. Further micro-siting post-consent would take place in such a way as to avoid where possible the excavation of deep peat.

3.1.2 PUBLISHED GEOLOGY

The BGS 1:50,000 superficial deposits map[12] indicates that most of the Site is situated on superficial deposits comprising Peat with the very north and south of the Site as well as a few

[12] BGS GeoIndex (2023). Onshore GeoIndex [Online] Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.232576351.1392439634.1719225346-1291810703.1719225345 (Accessed 24/06/2024)

instances throughout the centre of the Site shown to be situated on Till and Morainic Deposits (Undifferentiated), comprising Diamicton, Sand and Gravel.

The national soil map of Scotland[13] indicates that most of the Site (excluding southern and western boundaries) is situated on component soils comprising peaty gleys with dystrophic blanket peat with peaty gleyed podzols; soils which are part of the Gleys major soil group and Peaty Gleys major soil subgroup. The very west, and south of the Site is shown to be situated on component soils comprising peaty gleyed podzols with dystrophic semi-confined peat with peaty gleys; soils which are part of the Podzols major soil group and the peaty gleyed podzols major soil subgroup.

The Carbon and Peatland Map 2016[14] details that the Site is mostly underlain by Class 5 peat. This is not designated as a high priority peatland habitat and is classified as "*No peatland habitat recorded. May also include areas of bare soil. Soils are carbon-rich and deep peat*."

Land on the northern and western Site boundary is classified as Class 1 and Class 2 peat, nationally important carbon-rich soils of high conservation value, which are defined as:

- Class 1 Peat: "*Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value*".
- Class 2 Peat: "*Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas of potentially high conservation value and restoration potential*".

No development is proposed in areas of Class 1 or Class 2 peat.

The BGS 1:50,000 bedrock geology map[12] shows that most of the Site is underlain by the Altnaharra Psammite Formation comprising Psammite and Micaceous Psammite. The very south of the Site adjacent to Loch an Lagain is underlain by Migdale Pluton comprising Monzogranite. Migdale Pluton comprising Monzogranite is also noted in a few isolated instances through the centre of the Site.

3.1.3 INVESTIGATIONS

The existing peat depths across the Site have been determined through a phased survey approach. A detailed ground investigation was undertaken by IGNE during the period 9th of October to the 24th of November 2023. Twenty boreholes were sunk by dynamic sampling and rotary core drilling methods, and twenty-two trial pits were excavated by mechanical means. In addition Two hundred and forty-one peat probes were undertaken across the site. Subsequently ERM undertook further peat probing to inform the EIA and Site design work while supporting the PSRA. The total number of probes sunk during peat investigations was 651.

Phase one of the peat depth surveys was carried out consisting of a 100 m grid covering the whole Site, where possible. This rationale of probing is in accordance with the phase one approach as detailed in the Scottish Government guidance for investigating peat.

[13] Scotland's Environment (2023). National Soils Map of Scotland. [Online] Available at: Scotland's Soils - soil maps (environment.gov.scot) (Accessed 24/06/2024)
[14] Scotland's Environment (2023). 2016 Carbon and Peatland Map. [Online] Available at: https://map.environment.gov.scot/Soil_maps/?layer=1 Scotland's Soils - soil maps (environment.gov.scot) (Accessed 24/06/2024)

The peat depths are illustrated in Figure 10.2.1: Recorded Peat Depths within Appendix A of this oPMP.

3.1.4 SUMMARY OF PEAT DEPTHS

A total of 651 peat probes were taken throughout the peat surveys. Recorded peat depths of 0.5 m or less accounted for 49.2% of the total probing results with a further 20.7% of probes recording depths of 1.0 m or less. Appendix A, Figure 10.2.2 Interpolated Peat Depths shows the distribution of peat throughout the Site. The majority of the Site does not have deep peat however, there are significant areas of deeper peat in the north-west of the Site and the eastern side of the Site, where topography is typically flatter.

The deepest pocket of peat, up to 4.95 m, is located in a lower lying area of the Site in the north-west. This point is not beneath any proposed infrastructure.

Summary results from the IGNE ground investigation encountered peat in depths ranging from 0.3m to 2.0m in 18 of the 20 boreholes averaging 1.05m. The type of peat was recorded as typically dark brown pseudo-fibrous peat described as H3 to H6 on the von Post scale (very slight to moderately high decomposition). Peat was also recorded in all of the trial pits with depths ranging from 0.4m to 2.7m averaging 1.2m. Not all trial pits were classified on the von post scale, the 5 that were ranged between H4 to H6 (slight to moderately high decomposition) all were described as spongy dark brown pseudofibrous peat.

3.2 EXCAVATION AND RE-USE CALCULATION

Excavated peat volumes have been estimated through the production of a peat levels 3D surface derived from the peat depth data recorded during peat probing. This is compared to a 3D surface developed from the outline civil design of site infrastructure whilst some assumptions have been adopted.

The estimated peat excavation volumes are included in Table 3-1 using the anticipated construction activities that will generate excavated soils.

TABLE 3-1: PEAT EXCAVATION VOLUMES BASED ON CONSTRUCTION ACTIVITY

Development Component	Estimated Volume of Excavated Peat (m³)	Estimated Volume of Acrotelmic Peat (m³)	Estimated Volume of Catotelmic Peat (m³)
Substation	243,799	86,042	157,758
Access Tracks	10,323	8,217	2,106
Parking & Welfare Facilities	16,800	6,000	10,800
Ponds	7,044	2,642	4,403
Sub-Total	**277,966**	**102,900**	**175,066**
10% Contingency Factor	*27,797*	*10,290*	*17,507*
Total	**305,763**	**113,190**	**192,573**

A detailed assessment of excavated volumes by location within the Site is provided in Appendix B of this oPMP.

Peat will be re-used on Site within peat relocation areas within a wider peat re-use area. The volumes and depths to which peat will be reused within these areas is discussed in Table 3-2. The areas discussed can be viewed in Figure 10.2.3: Peat Re-Use Areas within Appendix A of this oPMP.

3.2.1 ESTIMATION OF PEAT RE-USE REQUIREMENTS

The principles of reinstating peat and peat soils should be adhered to for all elements of the Development, comprising of the following:

- Acrotelmic peat and peaty soils will be reinstated on access track verges and infrastructure edges with turves placed on the upper horizons, encouraging revegetation, where gradients allow;
- All peat, soil and turfs excavated from beneath infrastructure will be reinstated on the Site and should not be stored in excess of six months before reinstatement, where possible;
- Any wet catotelmic peat will be placed at the bottom of any restoration profile, followed by semi-fibrous catotelmic peat and acrotelmic peat should be placed at the top;
- It is proposed that a large proportion of excavated peat will be utilised in peatland restoration activities in line with the outline techniques discussed in the outline Habitat Management Plan (oHMP); and
- Peatland restoration activities will be overseen by the Ecological Clerk of Works (ECoW) to ensure methods are properly adhered to.

3.2.2 PEATLAND RESTORATION POTENTIAL

The outline objectives in proposing restoration of peatlands on Site are to:

- Ensure residual volumes of excavated peat from the Proposed Development are re-used in areas where ecological benefits are maintained or increased carbon sequestration can be delivered;
- Promote the re-use of excavated peat materials and avoid their disposal to landfill;
- Promote use of best practices and guidance to ensure that benefit is made from reusing peat and peaty soils for ecological enhancement; and
- Complement planned mitigation identified in the oHMP.

Peatland restoration should be achieved without resulting in significant loading of slopes which could increase the risk of peat slide events.

Table 3-2 shows how peat will be re-used across the Site in the various areas. These volumes are also included in Table 3-3.

TABLE 3-2: PEAT RE-USE

Peat Re-Use Area	Area (m^2)	Maximum Depth (m)	Volume (m^3)
Relocation Area A	94,000	2.0	44,000
Relocation Area C	51,489	2.0	22,000
Relocation Area D	75,446	2.0	60,000

Peat Re-Use Area	Area (m^2)	Maximum Depth (m)	Volume (m^3)
Re-Use Area	540,583	0.6 (average of 0.30)	162,235
Total	**761,518**	**-**	**288,235**

Table 3-3 shows the opportunities for the re-use of peat within the Site including the demand for acrotelm and catotelm peat, while Table 3-3 summarises the total peat balance estimated during construction of the Proposed Development and reinstatement of peat in peatland relocation and restoration areas.

TABLE 3-3: PEAT RE-USE VOLUMES BASED ON CONSTRUCTION ACTIVITY I

Development Area	Total Demand Estimate (m³)	Acrotelm Demand (m³)	Catotelm Demand (m³)	Reinstatement Thickness (max) (m)	Assumptions
Substation	2,563	2,563	0	Up to a maximum of 0.5 m	Substation platform area and associated earthworks will be dressed off with up to 0.5 m of peat and peaty soils as the in-situ peat depths and gradients allow. Average peat depths suggest only acrotelmic peat will need to be reused.
Access Tracks	8,964	8,964	0	Up to a maximum of 0.5 m	Where new permanent tracks are proposed, peat will be reinstated along verges and associated earthworks with peat up to 0.5 m thick with verges not expected to exceed 3 m on either side. Average peat depths suggest only acrotelmic peat will need to be reused.
Parking & Welfare Facilities	6,000	6,000	0	Pre excavation thickness	Parking and welfare facilities area and associated earthworks will be fully reinstated following construction to pre excavation levels.
Ponds	-	-	-	-	Peat will not be re-used within the SuDS pond.
Sub-total	17,528	17,528		-	
Re-use on Site	288,235	95,662	192,573	0.6 m (re-use areas) and 2 m (Relocation areas)	Peat will be reinstated to an average depth of 0.3 m and a maximum of 0.6 m throughout the restoration area. The storage areas will be reinstated to a maximum of 2 m depths.
Total	**305,763**	**113,190**	**192,573**		

Table 3-2 is presented as a summary of the assessment of peat reinstatement volumes. A detailed assessment is provided in Appendix B of this oPMP.

TABLE 3-4: PEAT BALANCE CALCULATIONS

Peat Description	Total Peat Demand Estimate for Reinstatement (m^3)	Total Peat Supply from Excavation (m^3)	Surplus (+) or Deficit (-) (m^3)
Acrotelm	113,190	113,190	0
Catotelm	192,573	192,573	0
Total	305,763	305,763	0

Table 3-3 demonstrates that there is a balance of peat in the Proposed Development as peat will be reused within the Proposed Development boundary.

3.2.3 HANDLING AND STORAGE OF PEAT

It will be necessary for the principal contractor to prescribe methods and timing involved in the excavation, handling and storage of peat for use in reinstatement. The contractor will be responsible for signing off appropriate peat storage areas and appointing a geotechnical engineer who will monitor any potential stability risks. Construction methods will be based on the following principles:

- The surface layer of peat (acrotelm) and vegetation will be stripped separately from the catotelmic peat. This will typically be an excavation depth of up to 0.5 m;
- Acrotelmic material will be stored separately from catotelmic material;
- Careful handling is essential to retain any existing structure and integrity of the excavated materials and thereby maximise the potential for excavated material to be re-used;
- Less humified catotelmic peat which maintains its structure upon excavation should be kept separate from any highly humified amorphous or wet catotelmic peat;
- Acrotelmic material will be replaced as intact as possible once construction progresses / as it is complete;
- To minimise handling and transportation of peat, acrotelmic and catotelmic will be replaced, as far as is reasonably practicable, in the locality from which it was removed. Acrotelmic material is to be placed on the surface of reinstatement areas;
- Temporary storage of peat will be minimised, with restoration occurring in parallel with other works;
- Suitable storage areas should be sited in locations with lower ecological value, low stability risk and 50 m from watercourses;
- Peat should be stored in stockpiles no greater than 2 m in height and should not be placed on slopes greater than 4% (2.29°);
- Reinstatement will, in all instances, be undertaken at the earliest opportunity to minimise storage of turves and other materials;
- Managing the construction work as much as possible to avoid periods when peat materials are likely to be wetter i.e. high rainfall events;

- Temporary storage and replacement of any peat excavated from the borrow pit should occur adjacent to and within the source pit;
- Transport of peat on Site from excavation to temporary storage and restoration site should be minimised; and
- Further information on the handling and storage of peat is included in Volume 4 - Appendix 2.1: General Environmental Management Plan (GEMP), specifically in the Soil Management GEMP.

3.2.4 WASTE MANAGEMENT PLAN REQUIREMENTS

Based on the calculations carried out, no waste management plan will be required as no material will be moved off the Site. Peat material will be reused and restored on the Site itself.

4. MITIGATION

4.1 GENERAL MITIGATION

General mitigation measures will be implemented in accordance with the peat excavation, handling and storage, and reinstatement methods detailed in Section 3 of this oPMP and section 7.4 of Appendix 10.1 Peat Slide Risk Assessment.

4.2 SPECIFIC MITIGATION

Along with the general mitigation measures presented in Section 4.1 and principles outlined in Section 3.2 on this oPMP, additional mitigation measures will be implemented by the Principal Contractor in specific areas of the Site where the potential impact on peat is considered to be the greatest.

5. CONCLUSION

The following conclusions are drawn regarding the management of peat and excavated materials within the Site:

- The Site design has minimised the disturbance of deep peat, wherever possible.
- As a result of the peat excavation and re-use estimates, all of the excavated peat will be reused within the Site boundary;
- Excavated peat will be reused on Site as detailed within the outline General Environmental Management Plan in Appendix 2.1;
- The estimates of excavated peat provided in this report are likely to be higher than those that occur during construction, as micro-siting, where possible, would allow for the avoidance of localised pockets of deeper peat;
- Sufficient methods have been defined to ensure that peat can be sensitively handled and stored on Site to allow for effective re-use; and
- No waste licence is required for the construction work.

6. REFERENCES

SNH (2017) Guidance on Developments on Peatland: Peatland Survey (2017) [Online] Available at: (https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2018/12/peatland-survey-guidance/documents/peatland-survey-guidance-2017/peatland-survey-guidance-2017/govscot%3Adocument/Guidance%2Bon%2Bdevelopments%2Bon%2Bpeatland%2B-%2Bpeatland%2Bsurvey%2B-%2B2017.pdf) (Accessed 28/06/2024)

SNH (2010) Floating Roads on Peat [Online] Available at: (http://www.roadex.org/wp-content/uploads/2014/01/FCE-SNH-Floating-Roads-on-Peat-report.pdf) (Accessed 28/06/2024)

Scottish Renewables et al. (2019) Good Practice during Wind Farm Construction [Online] Available at: https://www.scottishrenewables.com/publications/498-guidance-good-practice-during-wind-farm-construction | Scottish Renewables (Accessed 28/06/2024)

SEPA (2010) SEPA Regulatory Position Statement – Developments on Peat [Online] (Available at: (https://www.sepa.org.uk/media/143822/peat_position_statement.pdf) (Accessed 28/06/2024)

Joint Nature Conservation Committee: UKBAP [online] Available at: UK BAP | (https://jncc.gov.uk/our-work/uk-bap/) (Accessed 28/06/2024).

NatureScot - Scotland's National Peatland Plan: Working for our future [online] Available at: (https://www.nature.scot/doc/scotlands-national-peatland-plan-working-our-future) | NatureScot (Accessed 28/06/2024)

NatureScot – Scottish Biodiversity List [online] Available at: (https://www.nature.scot/doc/scottish-biodiversity-list) | NatureScot (Accessed 28/06/2024)

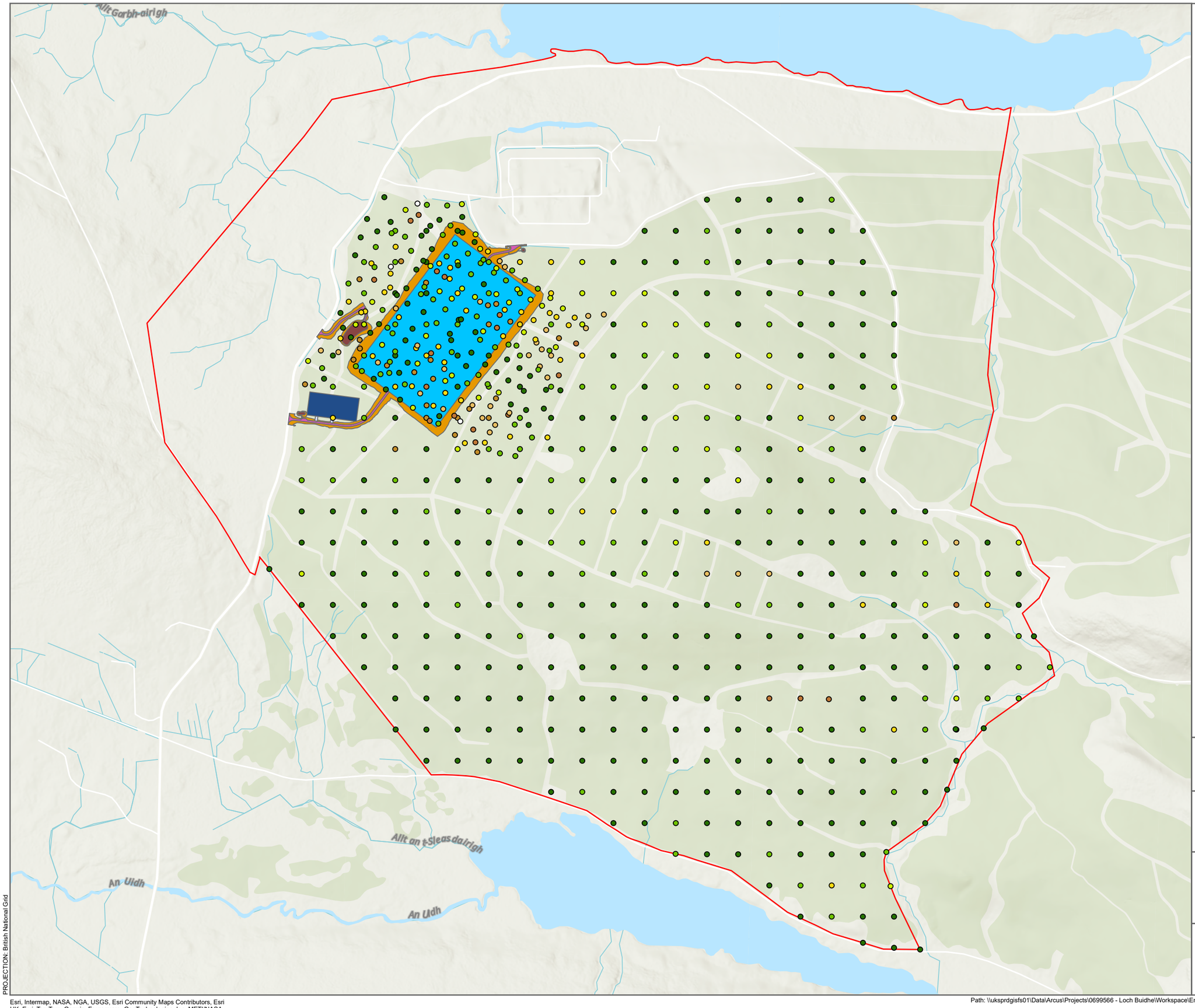
Scottish Government – "Securing a green recovery on a path to net zero: climate change plan 2018–2032 – update" [online] Available at: (https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/pages/12/) (www.gov.scot) (Accessed 28/06/2024)

Scottish Government – "The Scottish Soil Framework" [online] Available at: (https://www.gov.scot/publications/scottish-soil-framework/) (www.gov.scot) (Accessed 28/06/2024).

Scotland's Environment (2023). National Soils Map of Scotland. [Online] Available at: (https://soils.environment.gov.scot/maps/soil-maps/national-soil-map-of-scotland/) (environment.gov.scot) (Accessed 24/06/2024)

Scotland's Environment (2023). 2016 Carbon and Peatland Map. [Online] Available at: (https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/) (environment.gov.scot) (Accessed 24/06/2024)

APPENDIX A FIGURES



Site Boundary

Site Infrastructure

- Access Track
- Construction Compound
- Drainage Channel
- Earthworks
- SUDs Pond
- Substation Platform
- Temp Access Track

Peat 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 - 4.00
- >4.00

0 100 200 300 400 500

Metres

N

SCALE: See Scale Bar	VERSION: A01
SIZE: A3	DRAWN: MV
PROJECT: 0699566	CHECKED: RW
DATE: 24/07/2024	APPROVED: SC

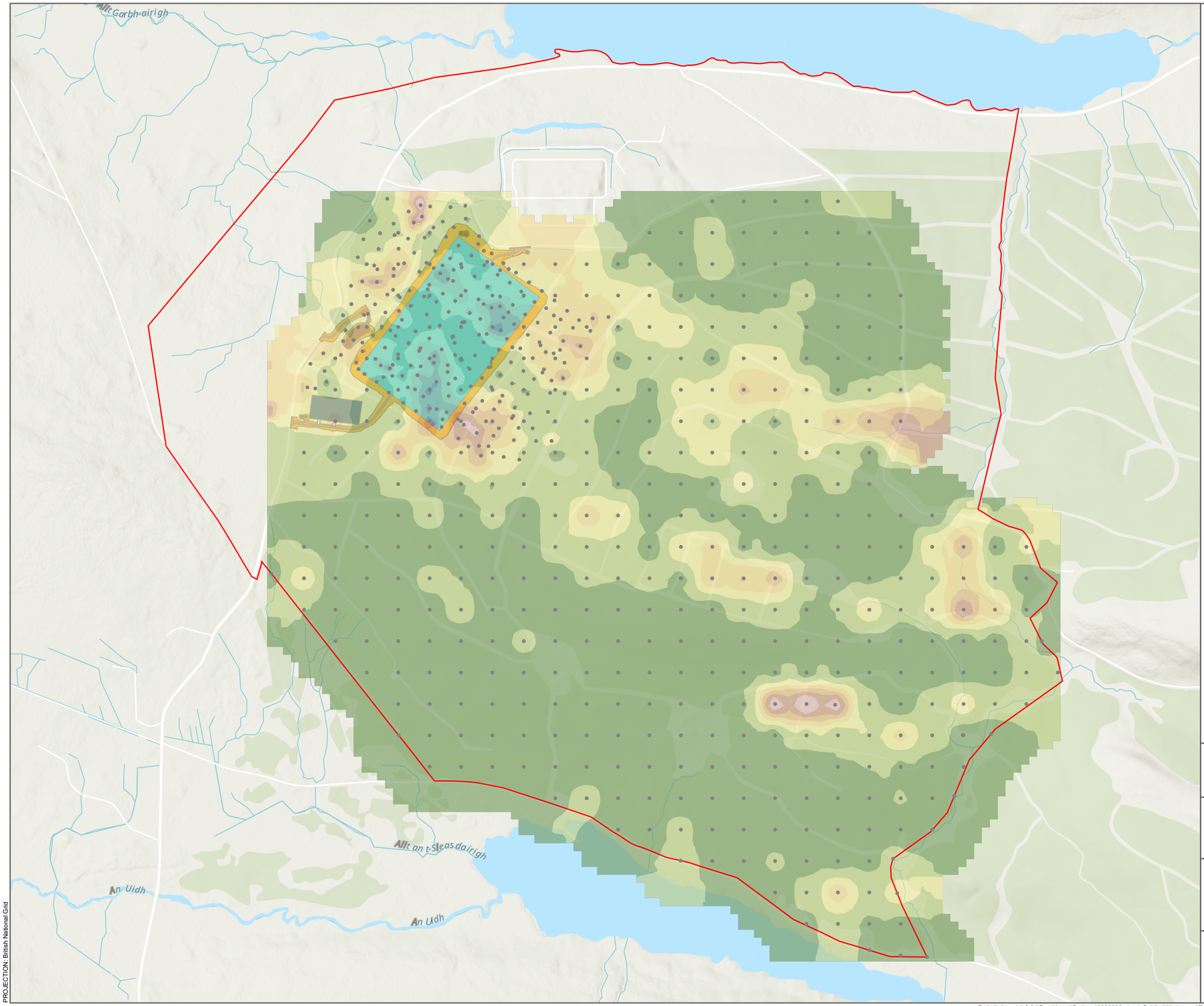
Figure 10.2.1
Recorded Peat Depths

ERM

Scottish & Southern Electricity Networks
TRANSMISSION

PROJECTION: British National Grid

Path: \\uksprdgisfs01\Data\Arcus\Projects\0699566 - Loch Buidhe\Workspace\Engineering\0699566 Loch Buidhe - Engineering\0699566 Loch Buidhe - Engineering.aprx



Site Boundary
Peat Probe Location

Site Infrastructure

Access Track
Construction Compound
Drainage Channel
Earthworks
SUDs Pond
Substation Platform
Temp Access Track

Peat Depths (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 - 4.00
>4.01

0 100 200 300 400 500
Metres

N

SCALE: See Scale Bar	VERSION: A01
SIZE: A3	DRAWN: MV
PROJECT: 0699566	CHECKED: RW
DATE: 24/07/2024	APPROVED: SC

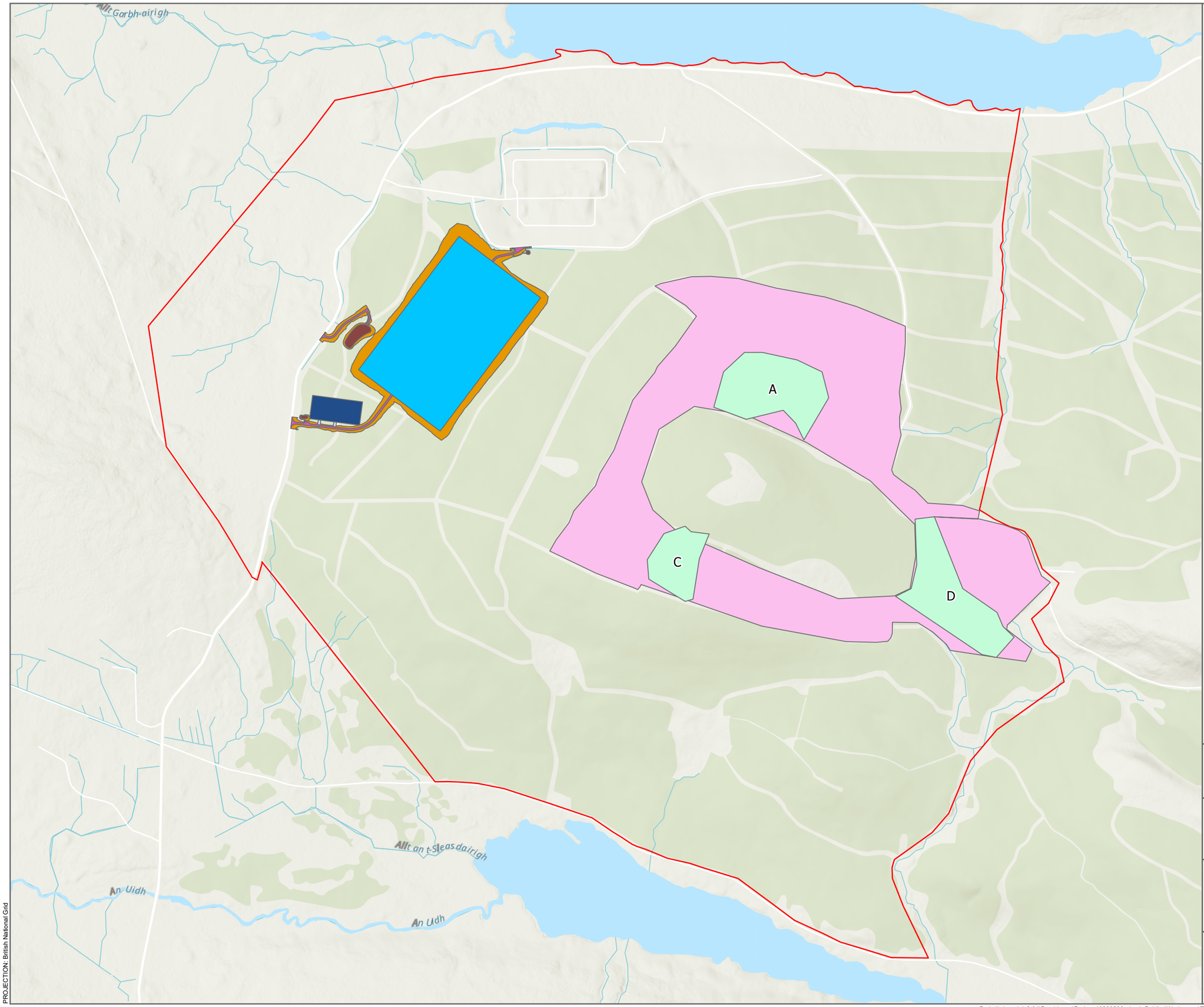
Figure 10.2.2
Interpolated Peat Depths

ERM

Scottish & Southern Electricity Networks
TRANSMISSION

PROJECTION: British National Grid

Path: \\uksprdgisfs01\Data\Arcus\Projects\0699566 - Loch Buidhe\Workspace\Engineering\0699566 Loch Buidhe - Engineering\0699566 Loch Buidhe - Engineering.aprx



Site Boundary
Non-Bunded Relocation Areas
Peat Re-Use Area

Site Infrastructure

Access Track
Construction Compound
Drainage Channel
Earthworks
SUDs Pond
Substation Platform
Temp Access Track

0 100 200 300 400 500
Metres

N

SCALE: See Scale Bar	VERSION: A01
SIZE: A3	DRAWN: MV
PROJECT: 0699566	CHECKED: RW
DATE: 24/07/2024	APPROVED: SC

Figure 10.2.3
Peat Re-use Areas

ERM

Scottish & Southern Electricity Networks
TRANSMISSION

PROJECTION: British National Grid

Path: \\uksprdgisfs01\Data\Arcus\Projects\0699566 - Loch Buidhe\Workspace\Engineering\0699566 Loch Buidhe - Engineering\0699566 Loch Buidhe - Engineering.aprx

APPENDIX B PEAT VOLUME CALCULATIONS

ERM HAS OVER 160 OFFICES ACROSS THE FOLLOWING COUNTRIES AND TERRITORIES WORLDWIDE

Argentina
Australia
Belgium
Brazil
Canada
China
Colombia
France
Germany
Ghana
Guyana
Hong Kong
India
Indonesia
Ireland
Italy
Japan
Kazakhstan
Kenya
Malaysia
Mexico
Mozambique
The Netherlands
New Zealand
Peru
Poland
Portugal
Romania
Senegal
Singapore
South Africa
South Korea
Spain
Switzerland
Taiwan
Tanzania
Thailand
UAE
UK
US
Vietnam

ERM Edinburgh
6th Floor,
102 West Port,
Edinburgh
EH3 9DN
T +44 0131 221 6750
www.erm.com