Scottish & Southern Electricity Networks

TRANSMISSION

Annex P - Peat Landslide Hazard and Risk Assessment

November 2022

ARGYLL SUBSTATIONS – CRAIG MURRAIL ENVIRONMENTAL APPRAISAL

ANNEX P

PEAT LANDSLIDE HAZARD AND RISK ASSESSMENT

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1 INTRODUCTION

1.1 Background

Arcus Consultancy Services Ltd (Arcus) was commissioned by ERM on behalf of SSEN Transmission Ltd (the Applicant) to carry out a Peat Landslide Hazard and Risk Assessment (PLHRA) to support an Environmental Assessment (EA) for the proposed Craig Murrail Substation and associated infrastructure (the Development) as part of the Argyll and Kintyre 275 kV Substations Upgrade, located approximately 3 kilometres (km) north of Lochgilphead (the Site) at National Grid Ref. 187725 691030.

The proposed substation, Temporary Works Area (TWA), Sustainable Urban Drainage System (SUDS) attenuation pond and permanent access tracks (hereby known as the Proposed Development) will be subject to Town and Country Planning, while the OHL Tie-In, Temporary Diversion accompanying towers and temporary access track (hereby known as the Associated Development) will be submitted for Section 37 consent. The Site Layout Plan is shown on **Figure 1** in **Appendix A** of this PLHRA.

This PLHRA has been prepared to inform Argyle & Bute Council (the Council) and statutory consultees of the estimated peat excavation and re-use potential, proposed peat and soils management methodologies to be employed during construction.

It should be noted that both Development's construction schedules will be aligned. Therefore, peat excavation and re-use will be considered within the wider scope of the Project.

This PLHRA will ensure the Project constitutes a construction project that complies with good practice in accordance with Scottish Renewables (SR) and Scottish Environment Protection Agency (SEPA) guidance[1].

The PLHRA is accompanied by the following appendices:

- Appendix A: Figures;
- Appendix B: Site Photographs;
- Appendix C: Hazard Rank Calculations; and
- Appendix D: Peat Coring Records.

1.2 Scope and Purpose

The scope of this PLHRA is to:

- Review available desk-based information on the Site;
- Undertake a site walkover survey and peat probe surveys to characterise the prevailing ground conditions and identify existing or potential peat instability;
- Report on the findings of the survey and assess the potential instability risk and estimate the hazard from any potential peat slide; and
- Recommend mitigation measures and specific construction methodologies that should be considered during the construction period, if required.

This PLHRA provides factual information on the peat survey results relating to the Proposed Development and Associated Development. The desk-based information and site surveys have been utilised to assess the potential risk of any peat slide. The methodology adopted, and details on the assessment, are outlined in **Sections 3, 4 and 5** of this PLHRA. The

[1] Scottish Government (2017) Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments [Online]. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2017/04/peat-landslide-hazard-risk-assessments-best-practice-guide-proposed-electricity/documents/00517176-pdf/00517176-pdf/govscot%3Adocument/00517176.pdf (Accessed 23/06/2022)

assessment has been undertaken in accordance with Scottish Government Guidance in assessing the likelihood, and consequence, of peat slide[2].

1.3 Project team

Team Member	Job Title	Qualifications	No. Years Experience
Gregor Hirst	Senior Engineer	BSc (Hons)	6 Years
David Ballentyne	Principal Engineer	BSc (Hons)	18 Years
Tomos Ap Tomos	Technical Director	BEng (Hons) MCIHT	25 Years

This assessment was undertaken by Gregor Hirst (BSc Hons), a Geo-Environmental Engineer of 6 years, and was supported by David Ballentyne a Geo-Environmental Civil Engineer with for over 18 years of experience in ground condition assessment. This Chapter has been technically reviewed by Tomos Ap Tomos, Technical Director of Engineering.

[2] Scottish Government (2017): Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments; Second Edition, April 2017 [Online]. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2017/04/peat-landslide-hazard-risk-assessments-best-practice-guide-proposed-electricity/documents/00517176-pdf/00517176-pdf/govscot%3Adocument/00517176.pdf (Accessed 23/06/2022)

2 SITE INFORMATION AND DESK STUDY

2.1 Site Description and Topography

The land within the site boundary (the Site) which contains the Proposed Development and Associated Development is located approximately 3 kilometres (km) north of Lochgilphead, covering an area of approximately 94 hectares (ha) centred on National Grid Reference (NGR) 87742 91011. The Site is located within the administrative boundary of Argyle & Bute Council (the Council). The Site is adjacent to existing Forestry Land Scotland (FLS) track associated with Achnabreac Forest, accessed from the A816 near Cairnbarn.

Topographically the Site has a gradual slope throughout from north west to south east; however, no steep gradients were observed during the walkover and the proposed infrastructure is generally located in flatter areas. The elevation of the Site ranges from around 110 metres (m) Above Ordnance Survey Datum in the south east (AOD) to around 150 m AOD in the north western sector of the Site.

There are a number of drainage channels associated with the forestry plantation at the Site, including a surface water feature which passes through a culvert beneath a track which dissects the Site from north east to south west; however, there are no recorded watercourses or lochs present within the Site boundary.

The predominant land use within the Site is commercial forestry plantation.

2.2 Site Walkover

The purpose of the desk study and site visit was to gain a thorough understanding of site conditions including topography, geology, existing peat instability and hydrology. The outcome of this stage of the study was to determine which areas required detailed intrusive survey (by peat probing) and ultimately provide data for the assessment of PLHRA.

A site walkover was undertaken in November 2021 prior to the commencement of the peat probing exercise. The Site was examined for evidence of peatlands, presence of landslip and localised hagging. Geological mapping and areas of interest were pre-loaded to a handheld device for reference during the site walkover. Following a review of these in parallel with the initial site walkover, the desk study aimed to identify and or verify the following:

- The general condition of peat deposits;
- Evidence of any previous peat instability;
- The presence of low lying wet/peat lands; and
- Watercourses and other potential receptors.

2.2.1 Site Conditions

The Proposed Development and Associated Development are in an area of mature conifer woodland with potential for red squirrel, a protected species. It is underlain by class 5 peat and does not support peatland habitats. Lochgilphead is approximately 3 km to the south. Auchoish, long cairn Scheduled Monument is approximately 600 m to the west. Knapdale National Scenic Area is approximately 1.8 km to the north west of the Site.

Neither mining nor quarrying activities are known to have taken place at the Proposed Development or Associated Development.

Site photographs taken during the site walkover are included in **Appendix B**.

2.3 Published Geology

2.3.1 Superficial Soils

Available British Geological Survey (BGS)[3] indicates an absence of superficial deposits across the entirety of the Site. However, given the rural upland location, a thin covering of peaty soil is anticipated across the majority of the site.

Figure 2 illustrates the 'Superficial Soils' map included in **Appendix A**.

2.3.2 Solid Geology

Published bedrock geology mapping information on solid geology indicates the eastern and southern sectors of the Site (where the proposed infrastructure is located) is underlain by Semipelite and Calcareous of the Ardrishaig Phyllite Formation. The remainder of the Site is underlain by Quartzite of the Crinan Grit Formation, other than various thin Sills and Dykes made up of intrusions of silica-poor magma, comprising a mixture of Metagabbro, Metamicrogabbro, Basalt and Metalimestone, which are present throughout the Site.

No geological faults or linear features are present at the Site or in the surrounding area.

Figure 3 illustrates the 'Solid Geology' included in **Appendix A**.

2.4 Hydrology and Hydrogeology

The Site is characterised by its generally flat topography, and lies in close proximity to a watershed running from the north to the south of the Site. Water therefore flows to the Lower Badden Burn to conference with and including the Auchoish Burn to the west and the Dippin/Cuilarstich Burn to the east. Both of these river systems drain to Loch Gilp.

Lower Badden Burn to conference with and including the Auchoish Burn, passes to the west of the Site and flows in a southerly direction. This watercourse has a SEPA overall classification[4] of 'Moderate'. The Dippin/Cuilarstich Burn passes the Site to the east and also flows in a southerly direction, it has a SEPA overall classification of 'Moderate'.

Initial desk-based review indicated the Site is likely to be partially underlain by peat with significant quantities of pockets of deep peat in isolated areas.

The SEPA Aquifer Classification Map of Scotland[5] reveals that the Site is situated within an area underlain by a low productivity aquifer where flow is virtually all through fractures and other discontinuities.

The SEPA River Basin Management Plan Interactive Map reveals that the Site is underlain by the Oban and Kintyre groundwater body. This groundwater body is classified by SEPA under the Water Framework Directive[6] as having a status of Good.

Figure 4 illustrates the Geomorphology of the Site and is included in **Appendix A**

2.5 Historical Landslip and Geomorphology

No evidence of historic landslip or peat hagging was noted during the Site walkover and topsoil, where undisturbed, generally appeared to be in good condition. Due to the presence of extensive forestry plantations at the Site, it is considered that properties of the

[3] British Geological Survey (2019) Geology of Britain [Online] Available at: http://mapapps.bgs.ac.uk/geologyofbritain/home.html (Accessed 01/06/22)

[4] SEPA Water Classification Hub (2020) [Online] Available at: Water Classification Hub (sepa.org.uk) (Accessed 01/06/2022)

[5] Scotland's Environment (2019) SEPA Aquifer Classification Map of Scotland [Online] Available at: https://map.environment.gov.scot/sewebmap/ (Accessed 01/06/22)

[6] European Parliament (2000) Directive 2000/60/EC [Online] Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:5c835afb-2ec6-4577-bdf8-756d3d694eeb.0004.02/DOC_1&format=PDF (Accessed 01/06/22)

peat deposits may have been altered and may not pose the same risk of instability as undisturbed peat. Nonetheless, the possibility of instability within peat soils cannot be discounted, especially where there are significant topographic variances and the presence of watercourses, and when there could be future deforestation.

3 SITE SURVEYS AND RESULTS

3.1 Investigations

The existing peat depths across the Site have been determined through a peat probe survey undertaken as recommended in the NatureScot (formally Scottish Natural Heritage), Scottish Government and James Hutton Institute guidance for investigating peat[7].

The probe positions for the survey were determined by the proposed layout of the Proposed Development and Associated Development and provided detailed information across the various proposed infrastructure at frequencies as follows:

- Substation – 10 m x 10 m grid to the extent of the proposed footprint;
- Temporary Works Area – 25 m x 25 m grid; and
- Tracks – Every 50 m along the centreline with perpendicular offsets, 15-25 m either side.

It should be acknowledged that natural variations in peat depth/thickness could occur between probe positions, although areas of infrastructure have undergone intensely spaced probing and this would be less likely.

3.2 Summary of Peat Depths

Throughout the peat survey, a total of 483 probes were progressed. The average peat depth across the Site is 1.22 m with over 31% of probes recording depths of 0.5 m or less and a majority of probes recording peat depths of 1.00 m or less. Despite a relatively high percentage of probes recording peat depths in excess of 1.0 m, depths are largely consistent across the Site with less than 22% of locations recording peat at depths greater than 2.0 m.

The maximum peat depth recorded at the Site was 4.5 m in the north eastern sector of the Site. Peat depths of up to 2.9 m were also recorded along the south eastern edge of the proposed substation and up to 3.5 m in the vicinity of the proposed tower in the southern sector of the Site.

Table 1 summarises the recorded peat depths.

Table 1: Peat Depth Summary

Peat Depth Range (m)	Nº of Peat Probes	Percentage of Total
0.00 - 0.50	150	31.1
0.51 - 1.00	98	20.3
1.01 - 1.50	75	15.5
1.51 - 2.00	55	11.4
2.01 - 2.50	55	11.4
2.51 - 3.00	36	7.5
>3.00	14	2.9
∑ =	483	

The peat probe locations and depths are shown on **Figure 5** appended with this PLHRA, and detailed probing records are included in **Appendix C**. The Interpolated Peat Depths were determined using the Inverse Distance Weighting (IDW) method of interpolation to a resolution of 5 m and are illustrated on **Figure 6**.

[7] Scottish Government, Scottish Natural Heritage and James Hutton Institute (2017) Guidance on Developments on Peatland (Online). Available at: Guidance+on+developments+on+peatland+-+peatland+survey+-+2017.pdf (www.gov.scot) [Accessed 23/06/2022].

3.3 Peat Cores

Peat cores were also obtained from selected areas of the Site where peat probing had identified areas of deep peat, in order to further characterise the peatland. The methodology in which the peat coring was undertaken was guided by the Peatland Survey (2017) *Guidance on Developments on Peatland* [8], commissioned by the Scottish Government, Scottish National Heritage (now NatureScot) and SEPA. An outline of the methodology along with photographs and characterisation of the peat cores are presented in the Peat Coring Records in **Appendix D**.

Humification of peat is determined using the Von Post scale which indicates the degree to which peat has undergone humification or, more correctly, a type of decomposition which includes breakdown under anaerobic conditions. The Von Post Scale (H) ranges from 1 to 10, the higher the number the higher the degree of humification.

The core samples were obtained to depths ranging from 1.8 m to 3.0 m and humification values ranged between 3 and 9, generally becoming more humified with depth, as presented in the Peat Coring Records along with definitions of the Von Post values in **Appendix D**.

[8] Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. *Guidance on Developments on Peatland*,

4 GUIDANCE AND METHODOLOGY

4.1 Overview of Guidance and Peat Failure Mechanisms

4.1.1 Peat Depth and Slope

The Scottish Government guidance divides peat instability into two categories: 'peat slides' and 'bog bursts'. The guidance states that peat slides have a greater risk of occurrence in areas where:

- Peat is encountered at or near to ground surface level;
- The thicknesses are recorded in the region of 2.0 m (above which, in general terms, peat instability would increase with peat thickness); and
- The slope gradients are steep (between 5° and 15°).

Bog bursts are considered to have a greater risk of occurrence in areas where:

- Peat depth is greater than 1.5 m; and
- Slope gradients are shallow (between 2° and 10°).

It should be noted however that peat instability events, although uncommon, can occur out with these limits. Reports of bog bursts are generally restricted to the Republic and Northern Ireland.

Further to the general guidance above, in relation to peat depth, it is considered that the extent and depth of peat is controlled to a degree by rainfall and elevation, giving rise to three common types of peat (Boylan et al. 2008[9]):

- Upland Blanket Bog: Blanket bogs are typically about 3 m thick however; they can be up to 5 m thick. Generally thinning at greater elevations;
- Raised Bog: Raised bogs generally tend to be 3-12 m thick, averaging 7 m with their growth occurring above the water table; and
- Lowland Blanket Bog: Much the same as the upland version; however, they form around sea level in areas of very high rainfall.

Generally, the potential for peat instability increases with peat depth, however other instability indicators need considered, namely slope and substrate.

4.1.2 Substrate

Peat slide failures tend to occur at the interface of the peat and underlying substrate therefore, understanding the nature of the underlying substrate can provide a key factor when considering the risk stability.

Using the peat probe refusal, an estimation of the underlying materials can be determined based on:

- Gradual refusal – Clay;
- Crunching/Gritty – Weathered Rock/Sand and Gravel; or
- Abrupt Refusal/Hard – Rock.

Where sand and/or gravel is recorded, the interface is considered to be the best-case scenario with the highest friction value.

Where clay is recorded, the upper horizons of the clay are typically softened through poor drainage in this soil group with low shear strengths expected. While rock substrate provides a high strength, the surface being smooth can lead to a weak interface, with similar risk to that of a clay substrate.

[9] Boylan et al (2008) Peat Slope Failure in Ireland

The presence of slip material, or evidence of peat instability would represent the worst-case scenario for the assessment of substrate.

The substrate parameters are included in the Hazard and Exposure Assessment in **Section 5** of this PLHRA.

4.1.3 Other Considerations

Preparatory factors which effect the stability of peat slopes in the short to medium-term include:

- Loss of surface vegetation (deforestation);
- Changes in sub-surface hydrology;
- Increase in the mass of peat through accumulation, increase in water content and growth of tree planting; or
- Reduction in shear strength of peat or substrate due to chemical or physical weathering, progressive creep and tension cracking.

Triggering factors which can have immediate effect on peat stability and act on susceptible slopes include:

- Intensive rainfall or snow melt causing pressures along existing or potential peat/substrate interfaces;
- Snow melt;
- Alterations to drainage patterns, both surface and sub-surface;
- Peat extraction at the toe of the slope reducing the support of the upslope material;
- Peat loading (commonly due to stockpiling) causing an increase in shear stress; and
- Earthquakes or rapid ground accelerations such as due to blasting or mechanical movement.

Consideration of peat stability should form an integral part of the design of infrastructure to be constructed on peatlands. While peat does not wholly provide a development constraint, areas of deep peat or peat deposits on steep slope should be either avoided through design and micro-siting; or mitigation measures should be designed to avoid instability and movement.

4.2 Methodology

Despite being an application under the Town and Country Planning (Scotland) Act 1997[10], the PLHRA has been carried out in accordance with the Energy Consents Unit, Scottish Government guidance of 2017 titled Peat Landslide Hazard and Risk Assessments - Best Practice Guide for Proposed Electricity Generation Developments[11].

In June 2014, Scottish Planning Policy[12] (SPP) and National Planning Framework (NPF3)[13] were published. In relation to peat and the assessment of effects on resource, NPF3 references SNH Scotland's National Peatland Plan[14]. These policy, framework and guidance documents are considered in this PLHRA.

[10] Scottish Government (1997) Town and Country Planning (Scotland) Act 1997 [Online] Available at: http://www.legislation.gov.uk/ukpga/1997/8/contents (Accessed 20/08/22)

[11] Scottish Government (2017) Peat Landslide Hazard and Risk Assessment: Best Practice Guide for Proposed Electricity Generation Development [Online] Available at: https://www.gov.scot/Publications/2017/04/8868 (Accessed 20/08/22)

[12] Scottish Government (2014) Scottish Planning Policy [Online] Available at: http://www.scotland.gov.uk/Topics/Built-Environment/planning/Policy (Accessed 20/08/22)

[13] Scottish Government (2014) National Planning Framework 3 [Online] Available at: http://scotland.gov.uk/Resource/0045/00453683.pdf (Accessed 20/08/22)

[14] SNH (2015) Scotland's National Peatland Plan [Online] Available at: https://www.nature.scot/climate-change/taking-action/carbon-management/restoring-scotlands-peatlands/scotlands-national-peatland-plan (Accessed 20/08/22)

The PLHRA undertaken is based on:

- Desk based assessment;
- Site Walkover;
- Infrastructure specific probing; and
- A hazard and risk ranking assessment.

The area of the Site subject to assessment was determined by the Proposed Development and Associated Development layout which considered both recorded peat deposits as well as other physical and environmental constraints.

4.2.1 Development of Hazard Rank

The early stages of the PLHRA including the desk study, site visit and peat probing were carried out in parallel with the assessment of wider constraints to inform the layout of the Proposed Development and Associated Development. Following identification of peat depths within the Site, the assessment has determined the potential effects on the peat resource from construction activities which would include:

- Construction of tracks;
- Foundation construction;
- Construction of hardstanding; and
- Temporary storage of peat and soils.

An assessment of the peat probing data and a review against desk study information was undertaken and a hazard rank was calculated for different zones across the site reflecting risk of peat instability/constraint to construction.

Where practical, the Proposed Development and Associated Development design would be progressed to avoid areas of a risk score above 'low'. Where this would not be achievable, areas affected would be discussed as having significant effect, with relative mitigation measures proposed to reduce this, and recorded on a risk register which sets out specific mitigation measures which are considered necessary to reduce the risk of inducing instability.

Details of the hazard and risk ranking assessment is included in **Sections 5 and 6** of this PLHRA.

5 HAZARD AND EXPOSURE ASSESSMENT

5.1 Background

A 'Hazard Ranking' system has been applied across the Site based on the analysis of risk of peat slide as outlined in the Scottish Government guidance. This is applied on the principle:

Hazard Ranking = Hazard x Exposure

Where 'Hazard' represents the likelihood of any peat slide event occurring and 'Exposure' being the impact or consequences that a peat slide may have on sensitive receptors that exist on and around the Site.

5.2 Methodology

The determination of Hazard and Exposure values is based on a number of variables which impact the likelihood of a peat slide (the Hazard), and the relative importance of these variables specific to the Site.

Similarly, the consequences or Exposure to receptors is dependent on variables including the particular scale of a peat slide, the distance it will travel and the sensitivity of the receptor.

In the absence of a predefined system, the approach to determining and categorising Hazard and Exposure is determined on a Site by Site basis. The particular system adopted for the PLHRA assessment is outlined in the following sub sections.

5.3 Hazard Assessment

The potential for a peat slide to occur during the construction depends on several factors, the importance of which can vary from Site to Site. The factors requiring considerations would typically include:

- Peat depth;
- Slope gradient;
- Substrate material;
- Evidence of instability or potential instability;
- Vegetation cover; and
- Hydrology.

Of these, peat depth and slope gradient are considered to be principal factors. Without a sufficient peat depth and a prevailing slope, peat slide hazard would be negligible.

- Evidence of instability or potential instability;
- Vegetation cover; and
- Hydrology.

Of these, peat depth and slope gradient are considered to be principal factors. Without a sufficient peat depth and a prevailing slope, peat slide hazard would be negligible.

The Slope Gradient has been established using a Digital Terrain Model (DTM) to a resolution of 5 m which is illustrated in **Figure 7**. For the Proposed Development and Associated Development, the substrate material is also considered a relevant factor in relation to slide.

Vegetation cover and evidence of instability or potential instability were assessed during site surveys and, alongside satellite photography, informed the Geomorphology Map

presented in **Figure 4**. This information was also considered during the adoption of hazard zones across the Site, which are presented in **Figure 9**: Hazard Rank Zonation Plan.

Due to the nature of the assessment and number of data points used to establish hazard ranking, gathering hydrological data at each probe point through the use of groundwater boreholes and a subsequent monitoring period is considered impractical. Therefore, an assumption on groundwater levels has been adopted for the assessment that 90% of the peat at each probe location is below the water table. As such, it is assumed that the water table across the Site is relatively high.

5.4 Hazard Rating

When several factors may impact on the Hazard potential, a relative ranking process is applied attributing different weighting to each factor as shown below.

Table 2: Coefficients for Slope Gradients

Slope Angle (degrees)	Slope Angle Coefficients
Slope < 2°	1
2° < Slope < 4°	2
4° < Slope < 8°	4
8° < Slope < 15°	6
Slope >15°	8

Table 3: Coefficients for Peat Thickness and ground conditions

Peat Thickness	Ground Conditions Coefficients
Peaty or organic soil (<0.5 m)	1
Thin Peat (0.5 – 1.0 m)	2
Deep Peat (>1.0 m)	3*
Deep Peat (>3.0 m)	8

* - Note that thicker peat generally occurs in areas of shallow gradient and records and research indicate that thick peat does not generally occur on the steeper gradients.

Table 4: Coefficients for Substrate

Substrate Material	Substrate Coefficients
Sand/gravel	1
Rock	1.5
Clay	2
Not proven	2
Slip material (Existing materials)	5

The Hazard Rating Coefficient for a particular location is calculated using the following equation:

Hazard Rating Coefficient = Slope Gradient x Peat Thickness x Substrate

From the Hazard Rating Coefficient, the risk to stability can be ranked as set out in **Table 5**.

Table 5: Hazard Rating

Hazard Rating Co-efficient	Potential Stability Risk (Pre-Mitigation)
<5	Negligible
5 to 15	Low
16 to 30	Medium
31 to 50	High
> 50	Very High

5.5 Peat Stability Assessment

The likelihood of a particular slope or hillside failing can be expressed as a Factor of Safety. For any potential failure surface, there is a balance between the weight of the potential landslide (driving force or shear force) and the inherent strength of the soil or rock within the hillside (shear resistance).

The guidance states that the 'Infinite Slope' method of analysis, after Skempton and DeLory (1957), is the most well established and commonly applied method for the assessment of peat slope stability. The stability of a slope can be assessed by calculating the factor of safety F, which is the ratio of the sum of resisting forces (shear strength) and the sum of the destabilising forces (shear stress):

$$F = \frac{c' + (\gamma - m\gamma_w) z \cos^2 \beta \tan \phi'}{\gamma z \sin \beta \cos \beta}$$

Where *c'* is the effective cohesion, *γ* is the bulk unit weight of saturated peat, *γw* is the unit weight of water, *m* is the height of the water table as a fraction of the peat depth, *z* is the peat depth in the direction of normal stress, *β* is the angle of the slope to the horizontal and ϕ' is the effective angle of internal friction. Values of F < 1 indicate a slope would have undergone failure under the conditions modelled; values of F > 1 suggest conditions of stability.

Assumed geotechnical parameters have been utilised in the formula to inform the stability assessment, based on literature values to inform the stability analysis, as included in **Table 6**.

Table 6: Literature for Geotechnical Parameters of Peat

Reference	Effective Cohesion C' (kPa)	Effective Angle of Friction ϕ (°)	Unit Weight Y' (kN/m2)	Comments
Hanrahan et al (1967)[15]	5.5 – 6.1	36.6 - 43.5	-	Remoulded H4 Sphagnum peat
Hollingshead and Raymond (1972)[16]	4.0	34	-	-
Hollingshead and Raymond (1972)	2.4 – 4.7	27.1 – 35.4	-	Sphagnum peat (H3, mainly fibrous)
Carling (1986)[17]	6.52	0	10	-
Kirk (2001)[18]	2.7 – 8.2	26.1 – 30.4		Ombrotrophic blanket peat
Warburton et al (2003)[19]	5.0	23	9.68	Basal Peat
Warburton et al (2003)	8.74	21.6	9.68	Fibrous Peat

[15] Hanrahan et al (1967) - Hanrahan, E.T., Dunne, J.M., and Sodha, V.G. 1967. Shear strength of peat. Proceedings Geotechnical Conference, Oslo, Vol. 1, pp. 193–198.

[16] Hollingshead and Raymond (1972) - Hollingshead, G.W., and Raymond, G.P. 1972. Field loading tests on Muskeg, Canadian Geotechnical Journal, 9(3): 278–289.

[17] Carling (1986) - Peat slides in Teesdale and Weardale, northern pennines, july 1983: Description and failure mechanisms

[18] Kirk (2001) - Initiation of a multiple peat slide on Cuilcagh Mountain, Northern Ireland

[19] Warburton et al (2003) - Anatomy of a Pennine peat slide, Northern England

Dykes and Kirk (2006)	3.2	30.4	9.61	Acrotelm
Dykes and Kirk (2006)	4.0	28.8	9.71	Catotelm

C' – effective cohesion (kPa), typically ranging from 2.5 to 8.5 therefore 5.0 has been adopted for the purposes of the assessment.

ϕ – effective angle of friction (°), typically ranging from 21.6 to 43.5 therefore 29.6 has been adopted for the purposes of the assessment.

Y' – unit weight (kN/m2), typically ranging from 9.61 to 10, therefore 10 has been adopted for the purposes of the assessment.

In accordance with the best practice method, F values of <1.0 indicate slopes that would experience failure under the modelled conditions and as such are considered areas of high risk. However, Boylan et al (2008) indicate that a relatively high value of F=1.4 should be used to identify slopes with the potential for instability. Adopting this approach, high risk areas area indicated where F is <1.0, medium risk areas are indicated as 1.01 to 1.50 and >1.5 are low risk.

Using digital terrain modelling and GPS co-ordinates of each peat probe, a factor of Safety, F has been calculated for each probe locations which has been interpolated through ArcGIS Spatial Analyst tools. The Factor of Safety Assessment provides a sense check of the ranking based system, providing an absolute approach to the 'Factor of Safety Plan' is shown on **Figure 8**.

The results of the Factor of Safety calculations indicated all points on the Site as low risk. This was primarily due to the light undulating topography and generally flat-lying conditions on the Site.

5.6 Exposure Assessment

The main Exposure receptors identified within the Site and surrounding area which could potentially be affected in the event of a peat slide were existing and/or proposed infrastructure, watercourses and associated tributaries and sensitive habitats.

The impact of a peat slide on receptors can be assessed on a relative scale based on the potential for loss of habitat, a historical feature or disruption/danger to the public. To effectively assess the impact, the assessment of Exposure effect must also consider the distance between the hazard and the receptor, and the relative elevation between the two.

5.7 Exposure Rating

Similar to the Hazard Rating, the Exposure Ratings were determined using relative ranking process by attributing the different weighting systems to each factor as shown below:

Table 7: Coefficients for Receptor Type

Receptor	Receptor Coefficients
Road, path or track	3
Minor water feature	6
Site infrastructure	6
Dwelling	8
Major water feature	8
Blanket bog	8

Table 8: Coefficients for Distance from Receptor

Distance from Receptor	Distance Coefficients
> 1 km	1
100 m to 1 km	2
10 m to 100 m	3
<10 m	4

Table 9: Coefficients for Receptor Elevation

Receptor Elevation	Elevation Coefficients
< 10 m	1
10 m to 50 m	2
50 m to 100 m	3
> 100 m	4

The Exposure Rating Coefficient for a particular location is calculated using the following equation:

Exposure Rating Coefficient = Receptor x Distance x Elevation

From the Exposure Rating Coefficient, the risk to stability can be ranked as set out in **Table 10**.

Table 10: Exposure Rating

Exposure Rating Co-efficient	Potential Stability Risk (Pre-Mitigation)
<6	Very Low
6 to12	Low
13 to 24	High
24 to 30	Very High
>30	Extremely High

5.8 Rating Normalisation

In order to achieve an overall Hazard Ranking in accordance with the Scottish Government Guidance, the Hazard and Exposure Rating Coefficient derived from the coefficient tables are normalised as shown in **Table 11**.

Table 11: Rating Normalisation

Hazard Rating		Exposure Rating	
Current Scale	**Normalised Scale**	**Current Scale**	**Normalised Scale**
< 5 Negligible	1	<6 Very Low	1
5 to 15 Low	2	6 to 12 Low	2
15 to 30 Medium	3	13 to 24 High	3

30 to 50 High	4	25 to 30 Very High	4
>50 Very high	5	>30 Extremely High	5

The record of the Hazard Rank Assessment is included in **Appendix C** of this PLHRA.

6 HAZARD RANKING

Having identified the rating coefficients in **Section 5** of this PLHRA, it is possible to categorise areas of the Site with a Hazard Ranking by multiplying the Hazard and Exposure Rating. Hazard Ranking and associated suggested actions matrix are shown in **Tables 12** and **13** below:

Table 12: Hazard Ranking and Suggested Actions

Hazard Ranking		Action Suggested in the Scottish Executive Guidance
17-25	High	Avoid project development at these locations.
11-16	Medium	Project should not proceed unless hazard can be avoided or mitigated at these locations, without significant environmental impact, in order to reduce hazard ranking to low or less
5-10	Low	Project may proceed pending further investigation to refine assessment. Mitigation of hazards maybe required through micro-siting or re-design at these locations.
1-4	Negligible	Project should proceed with monitoring and mitigation of peat landslide hazards at these locations as appropriate.

Table 13: Hazard Ranking Matrix

Hazard Rating						
	5	Low	Low	Medium	High	High
	4	Negligible	Low	Medium	Medium	High
	3	Negligible	Low	Low	Medium	Medium
	2	Negligible	Negligible	Low	Low	Low
	1	Negligible	Negligible	Negligible	Negligible	Low
		1	2	3	4	5
		Exposure Rating				

Receptor exposure was assessed for each of the five hazard zones using the approach in **Section 5**. A summary of the Hazard Ranking result for each identified area is summarised in **Table 14** and is presented in **Figure 9** - Hazard Ranking Zonation Plan. The zonation is based on a combination of considerations including calculated hazard result, peat depth, topography, receptors and land uses.

7 SLIDE RISK AND MITIGATION

7.1 General

The PLHRA has shown the Site to be of 'negligible' and 'low' hazard ranking with no areas of 'medium' or 'high' hazard ranking.

Of the 483 probe points, all were 'negligible' other than nine where 'low' hazard rankings were recorded. No 'medium' or 'high' risk areas have been identified within the Proposed Development or Associated Development and therefore a significant risk of peat slide is not considered to present based on the Hazard Ranking assessment. Nonetheless, a risk from peat slide may still exist and mitigation measures as outlined in **Section 7.3** of this PLHRA should be applied to minimise any risk.

Where the hazard ranking has been lowered through mitigation measures, the original ranking will remain in the overall hazard zoning plan. It should be acknowledged that the hazard zonation plan is based on the pre-mitigation status.

While specific recommended mitigation in 'low' ranked areas are proposed, other mitigation is embedded in the design. It is also necessary for detailed design and construction of the Proposed Development and Associated Development to be undertaken in a competent and controlled manner.

The embedded mitigation and good practice measures are set out in **Section 7.2** of this PLHRA. It should be noted that the mitigation measures defined are not exclusive and other forms of mitigation may well be required and should be implemented during construction of the Proposed Development and Associated Development.

Table 14: Hazard Ranking

Hazard Area and Infrastructure		**Unmitigated Hazard**		**Mitigated Hazard**	
Hazard Area	**Infrastructure Affected**	**Ranking**	**Key Aspects**	**Specific Actions**	**Ranking**
H1	Proposed Substation	Low	Location and topography: Zone covering northern quarter of the proposed substation in the western Site area. Hydrology: No watercourses run through this hazard zone Peat Depth: 0.1 m - 2.5 m. Generally, <1.0 m Slope Gradient: 0° to <10° Exposure: Proposed infrastructure	Best practice measures in relation to drainage prior to and during construction will be implemented as outlined in **Annex J: Water Construction Environmental Management Plan (WCEMP)** and management of peat and peaty soils as outlined in **Annex N: Peat Management Plan (PMP)**. During construction visual inspections and monitoring in	Negligible

Hazard Area and Infrastructure		Unmitigated Hazard		Mitigated Hazard	
				areas with the potential for peat slide risk should take place.	
H2	Proposed Substation	Negligible	Location and topography: South western Site area covering remaining three quarters of the Proposed Substation area. Hydrology: No watercourses run through this hazard zone Peat Depth: 0.0 m – 3.1 m. Generally, <2.00 m Slope Gradient: 0° to <30° Exposure: Proposed infrastructure	Best practice measures in relation to drainage prior to and during construction will be implemented as outlined in **Annex J: WCEMP** and management of peat and peaty soils as outlined in **Annex N: PMP**.	Negligible
H3	Proposed Temporary Access Track, Pylon 2 and SUDS Attenuation Pond	Low	Location and topography: Flat area covering the southern sector of the Site Hydrology: No watercourses run through this hazard zone Peat Depth: 1.80 m – 3.50 m. Generally, <3.00 m Slope Gradient: 0° to <5° Exposure: Proposed infrastructure	Best practice measures in relation to drainage prior to and during construction will be implemented as outlined in **Annex J: WCEMP** and management of peat and peaty soils as outlined in **Annex N: PMP**. During construction visual inspections and monitoring in areas with the potential for peat slide risk should take place.	Negligible
H4	Proposed Temporary Access Track, Pylon 1	Negligible	Location and topography: Area covering the south	Best practice measures in relation to drainage prior to	Negligible

Hazard Area and Infrastructure		Unmitigated Hazard		Mitigated Hazard	
			eastern sector of the Site Hydrology: No watercourses run through this hazard zone Peat Depth: 0.1 m – 2.3 m. Generally, <1.00 m Slope Gradient: 0° to <10° Exposure: Proposed tracks	and during construction will be implemented as outlined in **Annex J: WCEMP** and management of peat and peaty soils as outlined in **Annex N: PMP**.	
H5	Proposed Temporary Works Area and Temporary Track	Negligible	Location and topography: Large area covering the north eastern sector of the Site Hydrology: No watercourses run through this hazard zone Peat Depth: 0.1 m – 4.5 m. Generally, <1.50 m Slope Gradient: 0° to <15° Exposure: Proposed infrastructure	Best practice measures in relation to drainage prior to and during construction will be implemented as outlined in **Annex J: WCEMP** and management of peat and peaty soils as outlined in **Annex N: PMP**.	Negligible

7.2 Embedded Mitigation

Embedded mitigation includes measures taken during design of the Proposed Development and Associated Development to reduce the potential for peat slide risk. In summary the principal measures that have been taken are:

- Locating infrastructure on shallower slopes, where possible; and
- Locating infrastructure on areas of shallow peat (or no peat) where possible.

7.3 Peat Slide Mitigation Recommendations

The following mitigation measures should be adopted post consent stage to validate the PLHRA and influence the detailed design of the Proposed Development and Associated Development, including:

- Ground investigations prior to detailed design;

- Identification of areas sensitive to changes in drainage regime prior to detailed design;
- Update the PLHRA as necessary following detailed ground investigations;
- Development of a drainage strategy that will not create areas of concentrated flow and will not affect the current peatland hydrology;
- Design of a Development drainage system for tracks and hardstanding that will require minimal ongoing maintenance during the operation of the substation;
- Inspection and maintenance of the drainage systems during construction and operation;
- Identification of suitable areas for stockpiling material during construction prior to commencement of works; and
- Consideration of specific construction methods appropriate for infrastructure in peat land (i.e. geogrids) as part of design Development.

8 CONCLUSIONS

This PLHRA has been undertaken for the Proposed Development and Associated Development in accordance with best practice, as detailed in **Section 4.2** of the PLHRA. The early stages of the assessment included a desk study, historic peat probing across the Site, followed by completion of Phase 1 peat probing and a further intensive probing exercise on the finalised Site layout design. The information gathered during this investigation was used to develop a Hazard Ranking across the Site.

The findings of the probing indicate that the majority of the Proposed Development and Associated Development are underlain by peat less than 1.25 m in thickness with the exception of P2 which lies in an area where peat was recorded up to 3.5 m. While pockets of deep peat were recorded during the peat probing, deeper across the wider site area, the Proposed Development and Associated Development were designed to largely avoid these areas.

Based on the scope of the study, the PLHRA has indicated that the majority of the Site is generally of 'negligible' hazard ranking with two areas highlighted as 'low' hazard ranking.

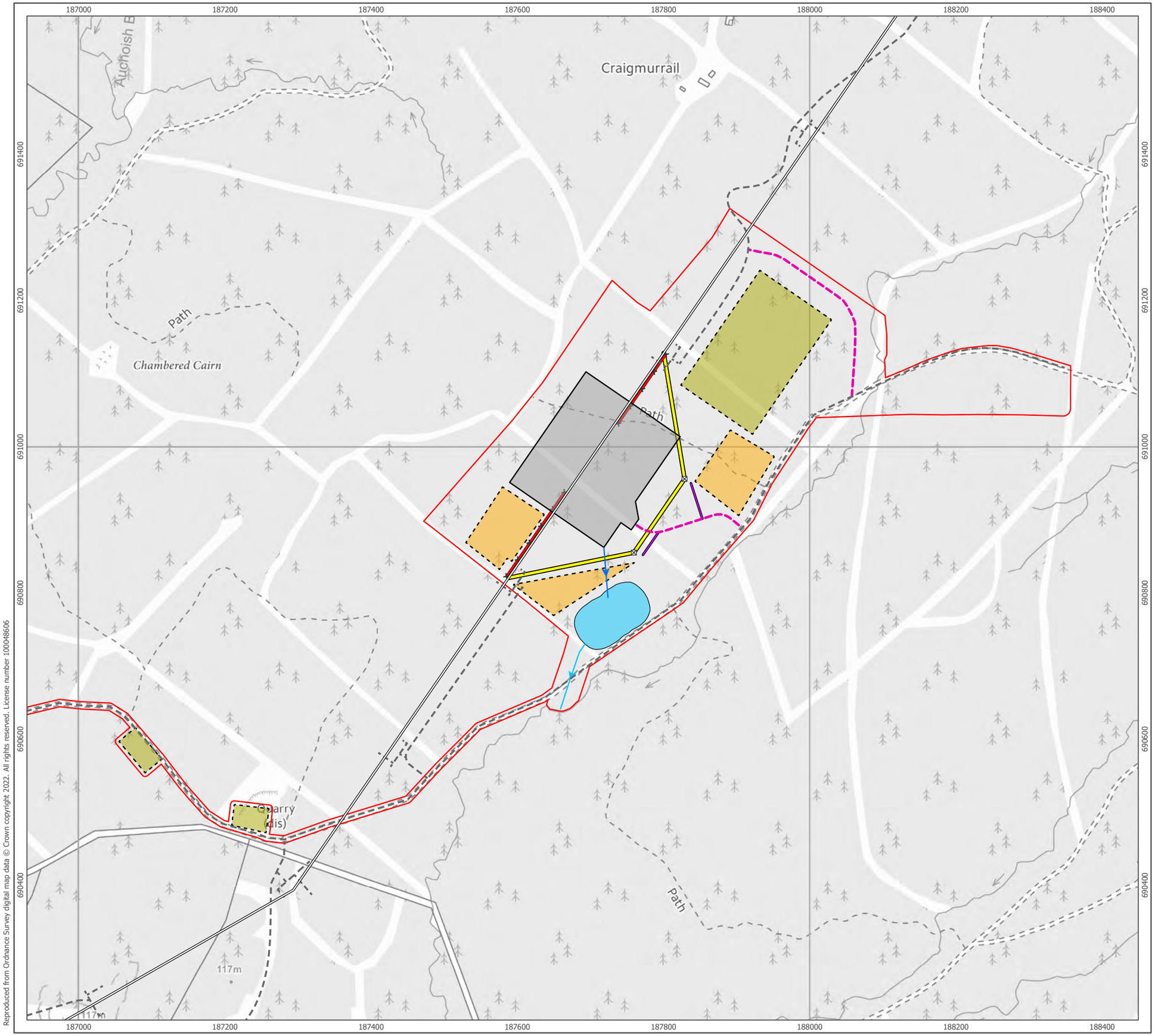
Notwithstanding the findings of the PLHRA, the final design of infrastructure should be carefully sited and micro-siting adopted if required in order to maintain the design objective of avoiding any potential peat slide risk.

9 SOURCES OF INFORMATION

The following sources of information were used as part of the desk study investigations:

- British Geological Survey - Online GeoIndex;
- Ordnance Survey (OS) topographical information;
- Aerial and Satellite photography.
- Soil Survey of Scotland - MacAulay Institute for Soil Research (1984);
- Soil Survey of Scotland - Scottish Peat Surveys (1964);
- Scottish Government - Peat Landslide Hazard and Risk Assessments (2017);
- Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey, Guidance on Developments on Peatland;
- The Scottish Government - Scotland's Third National Planning Framework (2014);
- The Scottish Government - Scottish Planning Policy (2014);
- Assessments by other technical specialists (specifically hydrology and ecology for data on sensitive receptors); and
- Scotland's Environment Interactive Map.

APPENDIX A - FIGURES



Scottish & Southern Electricity Networks

TRANSMISSION

ARCUS

- Existing Inveraray to Crossaig Overhead Line
- Existing Access Track

Proposed Development:

- Town & Country Planning Boundary
- Proposed Permanent Access Track
- SUDs Inlet Pipeline
- SUDs Outfall Pipeline
- Proposed Substation Temporary Works Area
- Proposed Substation Layout
- SUDs Pond
- Temporary Peat Storage Area

Associated Development:

- Proposed Tower Location
- OHL Downleads
- Temporary Access Track
- Temporary OHL Diversion

1:5,000 Scale @ A3

0 100 200 m

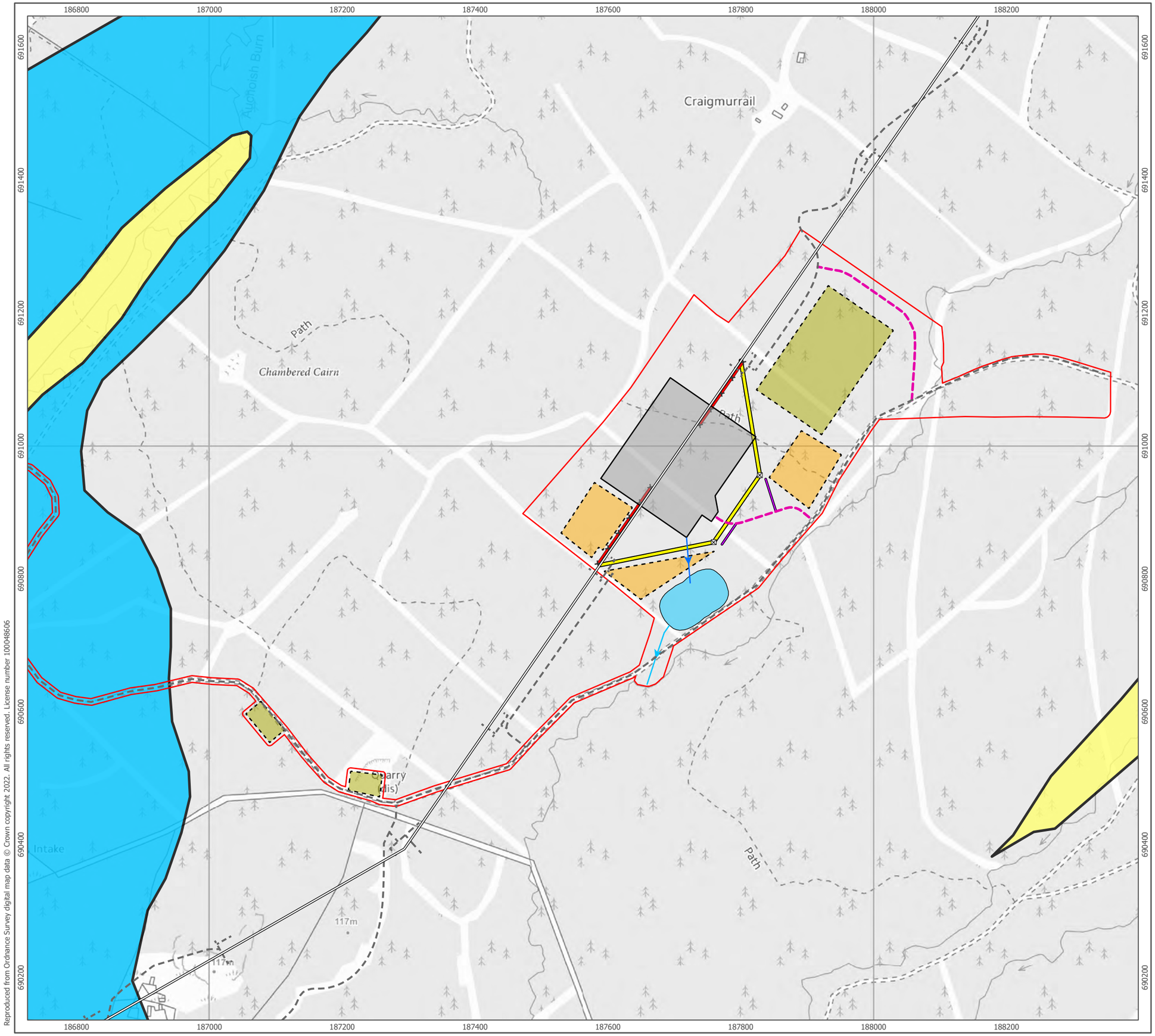
NORTH

Produced By: BM	Ref: 4534-REP-015
Checked By: DB	Date: 28/11/2022

Site Layout Plan
Figure P.1

Craig Murrail
Annex P: Peat Landslide Hazard and Risk Assessment

Y:\Arcus\GIS-CAD\GIS\Engineering\Projects\4534 Argyll Substations\4534 Craig Murrial Reports.aprx\4534-REP-019 Fig01 Site Layout Plan



Scottish & Southern Electricity Networks

TRANSMISSION

ARCUS

- Existing Inveraray to Crossaig Overhead Line
- Existing Access Track

Proposed Development:

- Town & Country Planning Boundary
- Proposed Permanent Access Track
- SUDs Inlet Pipeline
- SUDs Outfall Pipeline
- Proposed Substation Temporary Works Area
- Proposed Substation Layout
- SUDs Pond
- Temporary Peat Storage Area

Associated Development:

- Proposed Tower Location
- OHL Downleads
- Temporary Access Track
- Temporary OHL Diversion

Superficial Soils

- Alluvium
- Till, Devensian
- Superficial Soils Not Mapped

1:5,500 Scale @ A3

0 100 200 m

NORTH

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Checked By: DB	Date: 11/28/2022

Superficial Soils
Figure P.2

Craig Murrail
Annex P: Peat Landslide Hazard and Risk Assessment

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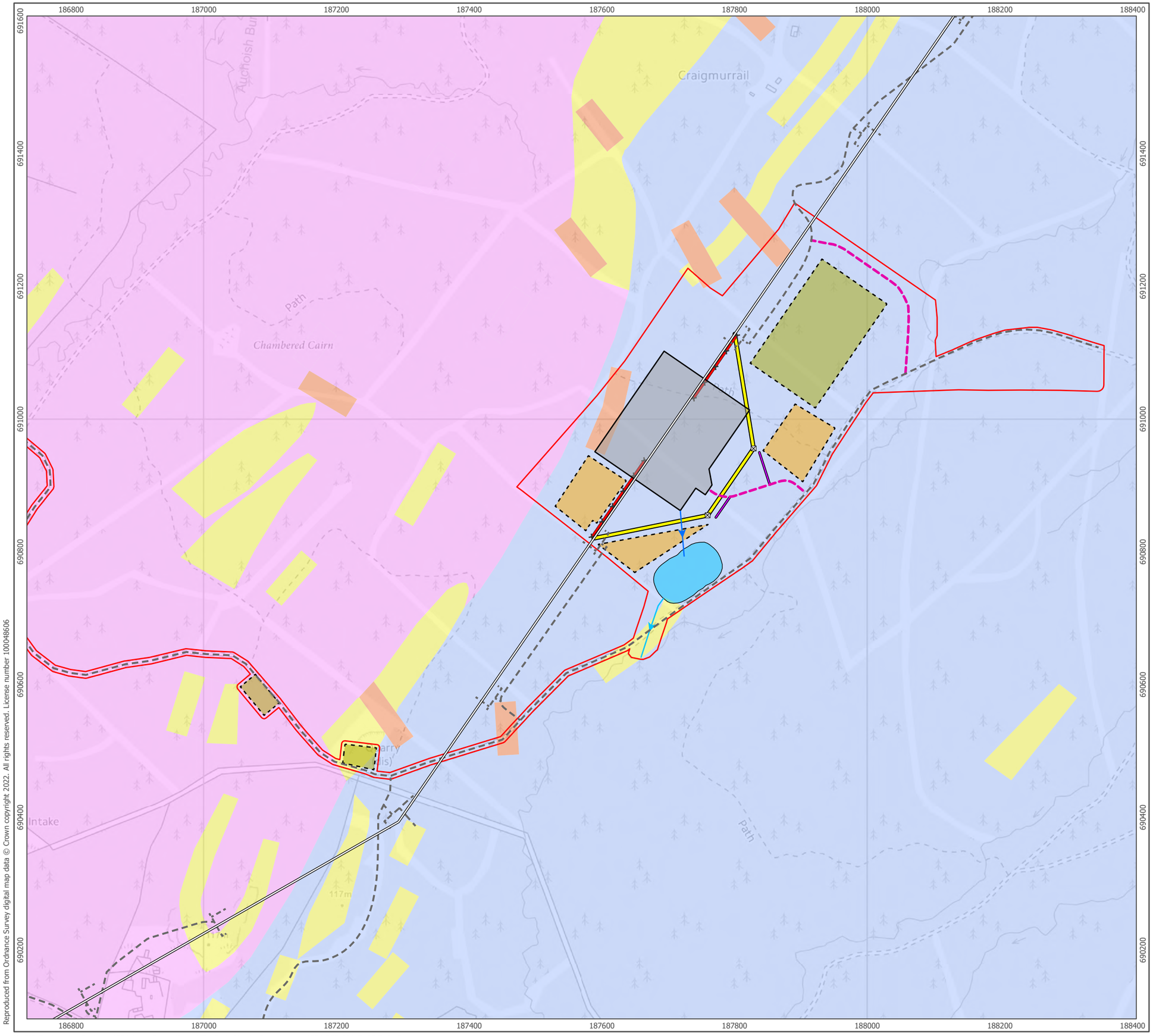


Scottish & Southern Electricity Networks

TRANSMISSION

ARCUS

- Existing Inveraray to Crossaig Overhead Line
- Existing Access Track

Proposed Development:

- Town & Country Planning Boundary
- Proposed Permanent Access Track
- SUDs Inlet Pipeline
- SUDs Outfall Pipeline
- Proposed Substation Temporary Works Area
- Proposed Substation Layout
- SUDs Pond
- Temporary Peat Storage Area

Associated Development:

- Proposed Tower Location
- OHL Downleads
- Temporary Access Track
- Temporary OHL Diversion

Solid Geology

- Ardrishaig Phyllite Formation
- Crinan Grit Formation
- Dalradian Supergroup
- Mull Dyke-Swarm

1:5,500 Scale @ A3

0 100 200 m

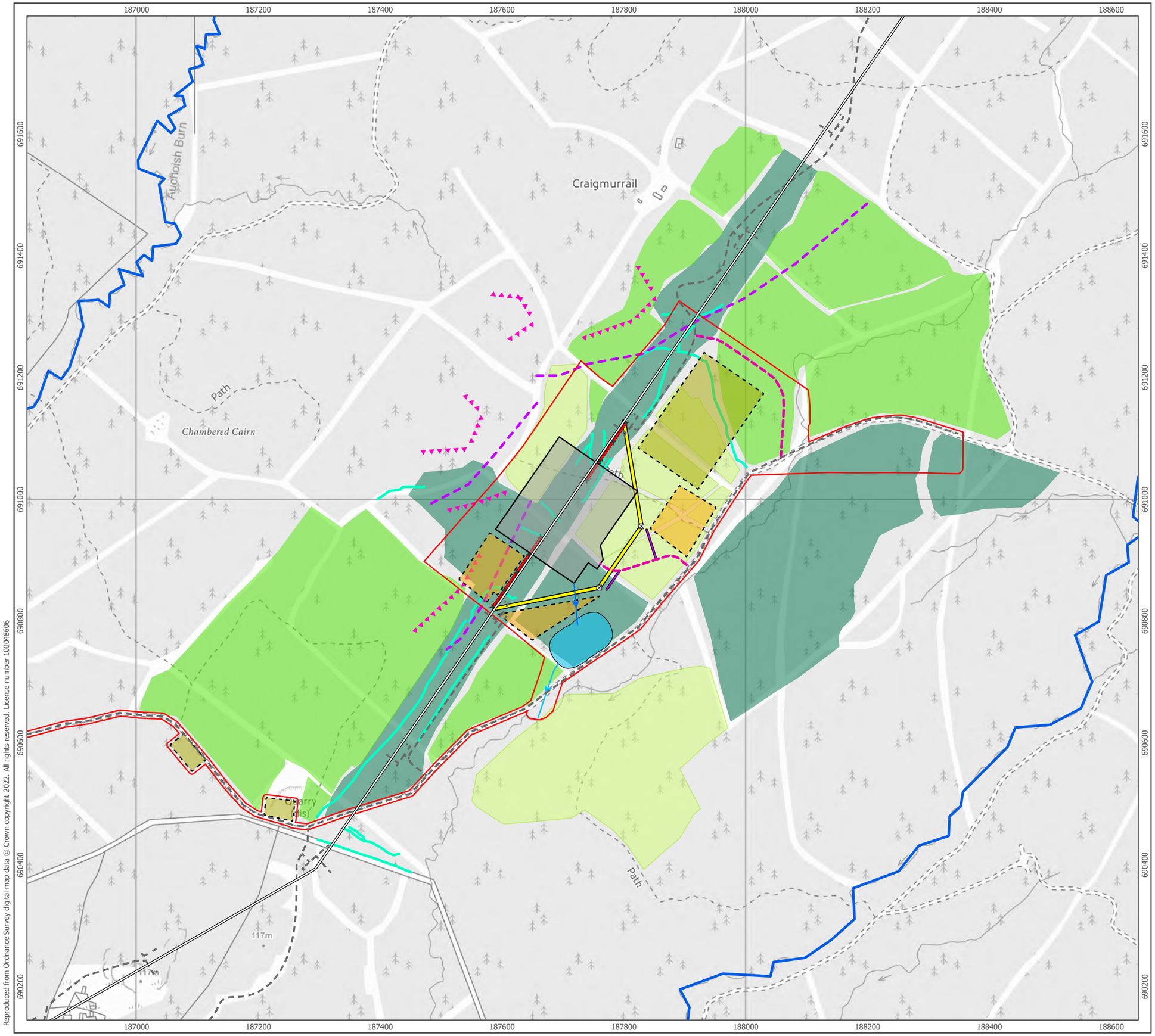
NORTH

Produced By: BM	Ref: 4534-REP-015
Checked By: DB	Date: 11/28/2022

Solid Geology
Figure P.3

Craig Murrail
Annex P: Peat Landslide Hazard and Risk Assessment

Y:\GIS\Engineering\Projects\4534 Argyll Substations\4534 Craig Murrial Reports.aprx\4534-REP-021 Fig03 Solid Geology



Scottish & Southern Electricity Networks

TRANSMISSION

ARCUS

- Existing Inveraray to Crossaig Overhead Line
- Existing Access Track

Proposed Development:

- Town & Country Planning Boundary
- Proposed Permanent Access Track
- SUDs Inlet Pipeline
- SUDs Outfall Pipeline
- Proposed Substation Temporary Works Area
- Proposed Substation Layout
- SUDs Pond
- Temporary Peat Storage Area

Associated Development:

- Proposed Tower Location
- OHL Downleads
- Temporary Access Track
- Temporary OHL Diversion

Geomorphology

- Major Watercourse
- Top of Slope
- Bottom of Slope
- Artificial Drainage
- Young Forestry
- Mature Forestry
- Deforested Area

1:6,000 Scale @ A3

0 125 250 m

NORTH

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Checked By: DB	Date: 28/11/2022

Geomorphology Map
Figure P.4

Craig Murrail
Annex P: Peat Landslide Hazard and Risk Assessment

Y:\Arcus\GIS-CAD\GIS\Engineering\Projects\4534 Argyll Substations\4534 Craig Murrial Reports.aprx\4534-REP-022 Fig04 Geomorphology Map

Scottish & Southern Electricity Networks

TRANSMISSION

ARCUS

- Existing Inveraray to Crossaig Overhead Line
- Existing Access Track

Proposed Development:

- Town & Country Planning Boundary
- Proposed Permanent Access Track
- SUDs Inlet Pipeline
- SUDs Outfall Pipeline
- Proposed Substation Temporary Works Area
- Proposed Substation Layout
- SUDs Pond
- Temporary Peat Storage Area

Associated Development:

- Proposed Tower Location
- OHL Downleads
- Temporary Access Track
- Temporary OHL Diversion

Recorded Peat Depths (m)

- 0.01 - 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

1:5,000 Scale @ A3

0 100 200 m

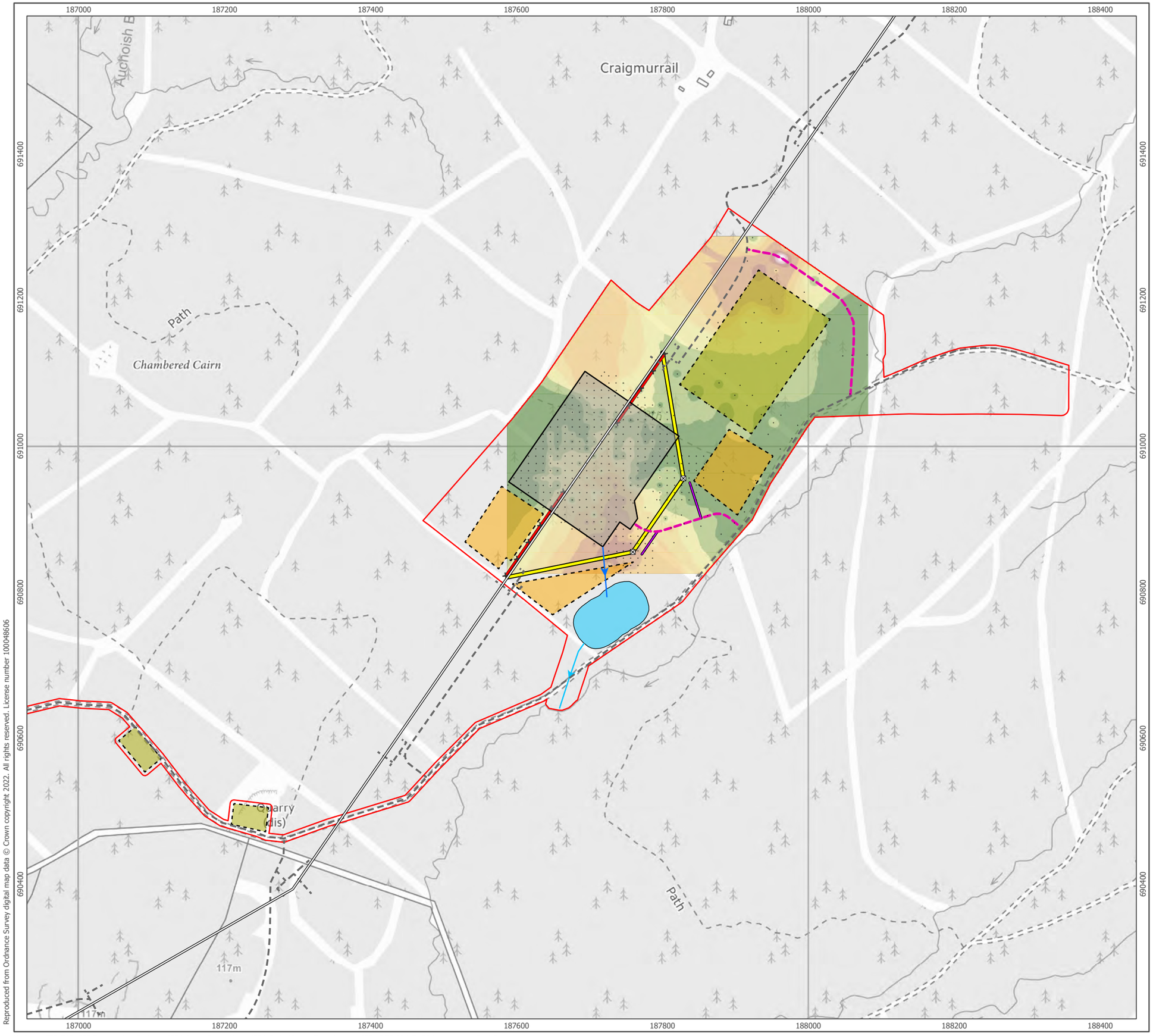
NORTH

Produced By: BM	Ref: 4534-REP-023
Checked By: DB	Date: 28/11/2022

Recorded Peat Depths
Figure P.5

Craig Murrail
Annex P: Peat Landslide Hazard and Risk Assessment

Y:\Arcus\GIS-CAD\GIS\Engineering\Projects\4534 Argyll Substations\4534 Craig Murrial Reports.aprx\4534-REP-023 Fig05 Recorded Peat Depths



Scottish & Southern Electricity Networks

TRANSMISSION

ARCUS

- Existing Inveraray to Crossaig Overhead Line
- Existing Access Track

Proposed Development:

- Town & Country Planning Boundary
- Proposed Permanent Access Track
- SUDs Inlet Pipeline
- SUDs Outfall Pipeline
- Proposed Substation Temporary Works Area
- Proposed Substation Layout
- SUDs Pond
- Temporary Peat Storage Area

Associated Development:

- Proposed Tower Location
- OHL Downleads
- Temporary Access Track
- Temporary OHL Diversion

Interpolated 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 - 3.50
- 3.51 - 4.00
- 4.01 - 4.50
- Peat Probe Location

1:5,000 Scale @ A3

0 100 200 m

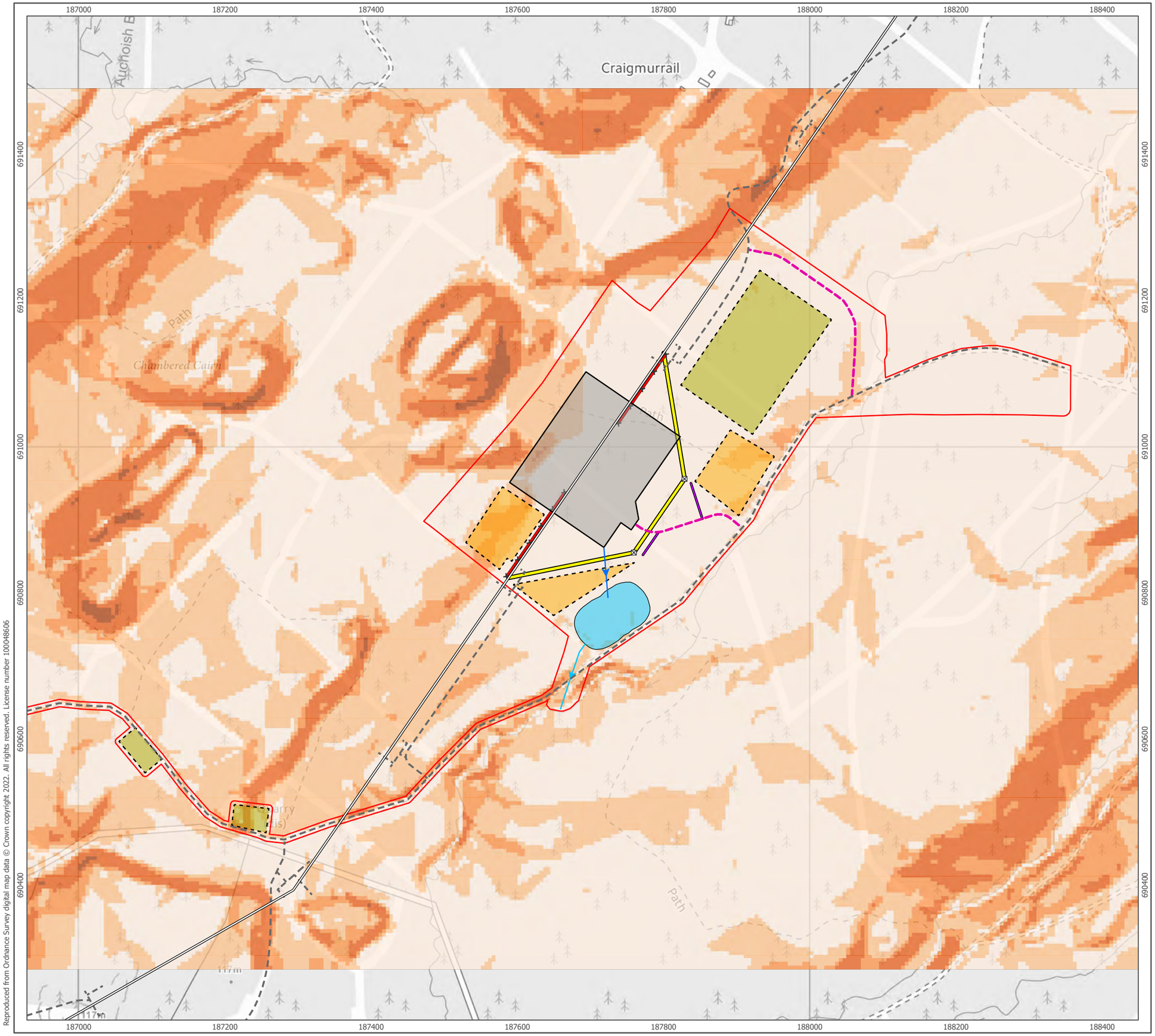
NORTH

Produced By: BM	Ref: 4534-REP-024
Checked By: DB	Date: 28/11/2022

Interpolated Peat Depths
Figure P.6

Craig Murrail
Annex P: Peat Landslide Hazard and Risk Assessment

Y:\Arcus\GIS-CAD\GIS\Engineering\Projects\4534 Argyll Substations\4534 Craig Murrial Reports.aprx\4534-REP-024 Fig06 Interpolated Peat Depths



Scottish & Southern Electricity Networks

TRANSMISSION

ARCUS

- Existing Inveraray to Crossaig Overhead Line
- Existing Access Track

Proposed Development:

- Town & Country Planning Boundary
- Proposed Permanent Access Track
- SUDs Inlet Pipeline
- SUDs Outfall Pipeline
- Proposed Substation Temporary Works Area
- Proposed Substation Layout
- SUDs Pond
- Temporary Peat Storage Area

Associated Development:

- Proposed Tower Location
- OHL Downleads
- Temporary Access Track
- Temporary OHL Diversion

Slope Gradient (deg)

- 0 - 5
- 5 - 10
- 10 - 15
- 15 - 30
- 30 - 90

1:5,000 Scale @ A3

0 100 200 m

NORTH

Produced By: BM	Ref: 4534-REP-025
Checked By: DB	Date: 28/11/2022

Slope Map
Figure P.7

Craig Murrail
Annex P: Peat Landslide Hazard and Risk Assessment

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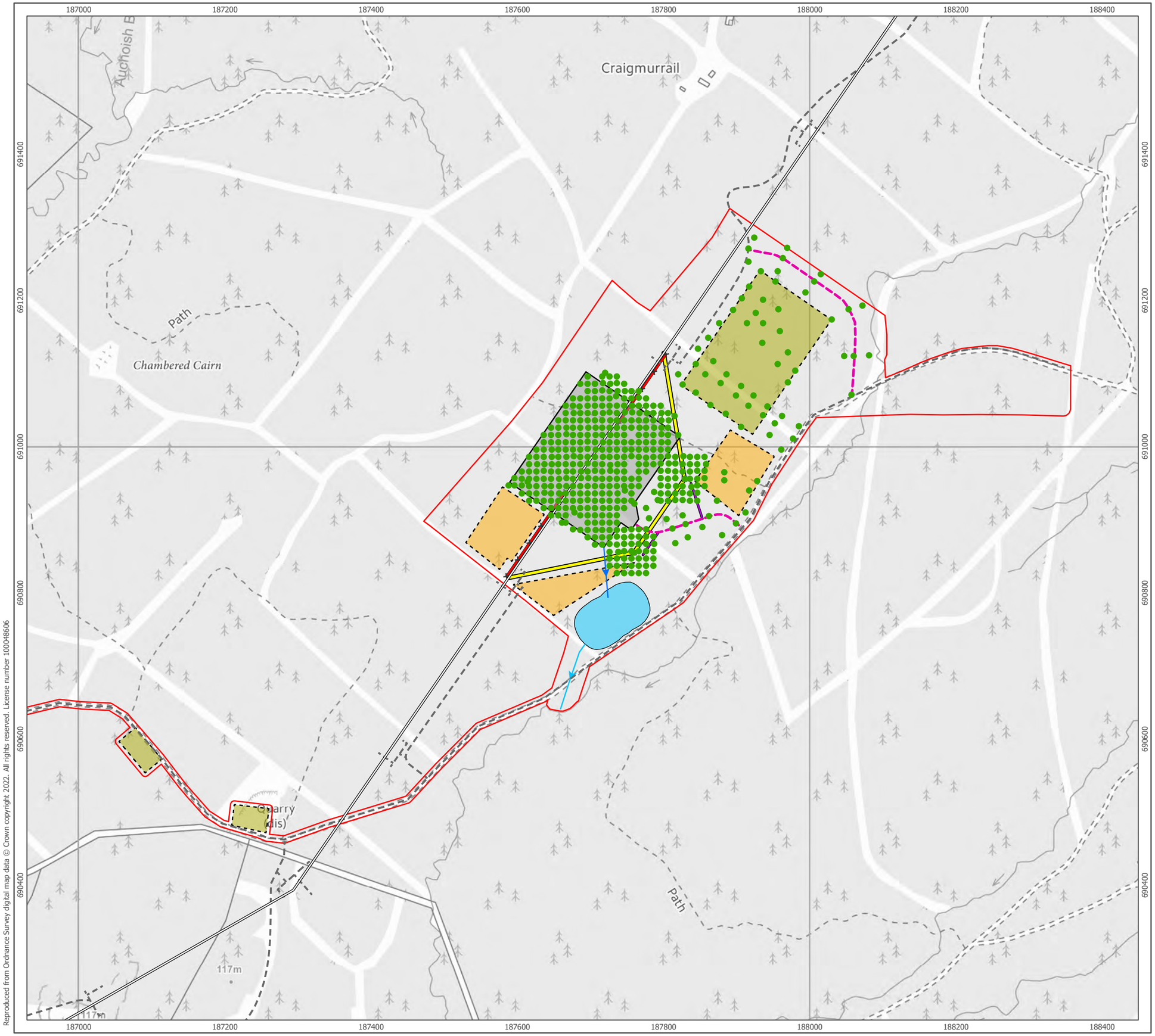

Scottish & Southern Electricity Networks

TRANSMISSION

ARCUS

- Existing Inveraray to Crossaig Overhead Line
- Existing Access Track

Proposed Development:

- Town & Country Planning Boundary
- Proposed Permanent Access Track
- SUDs Inlet Pipeline
- SUDs Outfall Pipeline
- Proposed Substation Temporary Works Area
- Proposed Substation Layout
- SUDs Pond
- Temporary Peat Storage Area

Associated Development:

- Proposed Tower Location
- OHL Downleads
- Temporary Access Track
- Temporary OHL Diversion

Factor of Safety

- Low Risk

1:5,000 Scale @ A3

0 100 200 m

NORTH

Produced By: BM	Ref: 4534-REP-026
Checked By: DB	Date: 28/11/2022

Factor of Safety Plan
Figure P.8

Craig Murrail
Annex P: Peat Landslide Hazard and Risk Assessment

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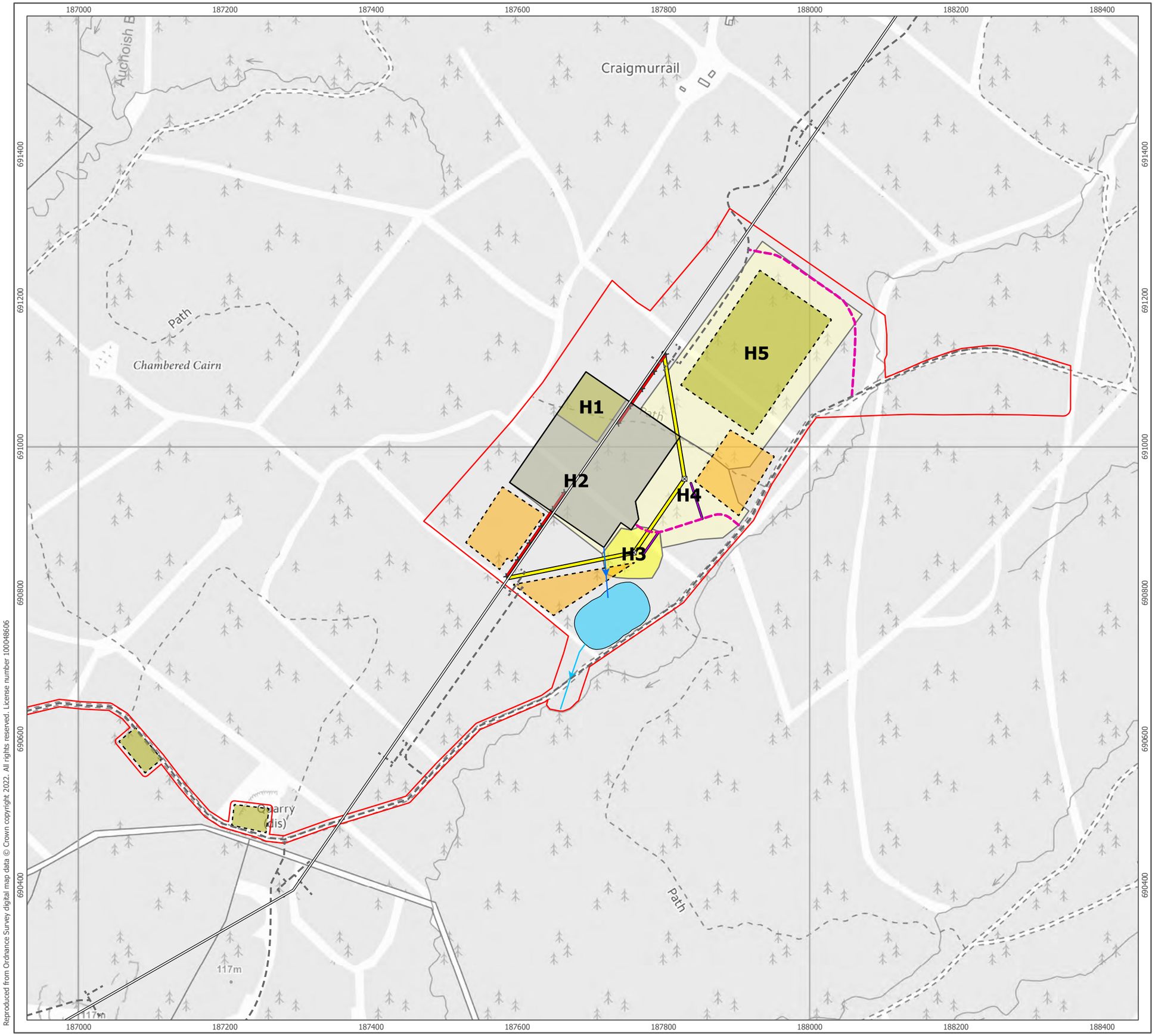

Scottish & Southern Electricity Networks

TRANSMISSION

ARCUS

- Existing Inveraray to Crossaig Overhead Line
- Existing Access Track

Proposed Development:

- Town & Country Planning Boundary
- Proposed Permanent Access Track
- SUDs Inlet Pipeline
- SUDs Outfall Pipeline
- Proposed Substation Temporary Works Area
- Proposed Substation Layout
- SUDs Pond
- Temporary Peat Storage Area

Associated Development:

- Proposed Tower Location
- OHL Downleads
- Temporary Access Track
- Temporary OHL Diversion

Hazard Rank Zonation

- Negligible
- Low

1:5,000 Scale @ A3

0 100 200 m

NORTH

Produced By: BM	Ref: 4534-REP-027
Checked By: DB	Date: 28/11/2022

Hazard Rank Zonation Plan
Figure P.9

Craig Murrail
Annex P: Peat Landslide Hazard and Risk Assessment

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APPENDIX B - SITE PHOTOGRAPHS

Photograph 1 – View west across proposed substation area

Photograph 2 – View east across proposed substation area

Photograph 3 – View south from northern site area

Photograph 4 – View north across proposed substation area

Photograph 5 – Culvert over drainage ditch in central Site area

Photograph 6 – Forestry plantation within southern site area

APPENDIX C – HAZARD RANK ASSESSMENT RECORDS

4534 - Argyll Substations - PSRA - Tabulated Peat Probe Data - May 2022

ID	X	Y	Z	SLOPE	Slope Co-efficient	PEAT DEPTH	Peat Level	Peat Co-efficient	Gen Substrate	Substrate Co-eff.	Risk Rating Coefficient	Risk Rating Normalisation	Receptor	Receptor Co-eff.	Z Receptor	Distance	Receptor Dist Co-eff.	Z Difference (remove =/-)	Receptor elevation Co-eff	Impact Rating	Impact Rating Normalisation	Hazard Ranking
1	187970	691088	116.055332	1.652958	1	0.9	115.155332	2	R	1.5	3	1	Site Infrastructure	3	116.032812	0.993996	4	0.02252	1	12	2	2
2	187980	691104	116.447397	1.886635	1	0.6	115.847397	2	G	1	2	1	Site Infrastructure	3	116.426007	1.009153	4	0.02139	1	12	2	2
3	187970	691129	116.619424	1.476276	1	0.9	115.719424	2	R	1.5	3	1	Site Infrastructure	3	116.593591	0.847922	4	0.025833	1	12	2	2
4	187956	691113	116.073561	1.090161	1	0.9	115.173561	2	R	1.5	3	1	Site Infrastructure	3	116.066256	0.51627	4	0.007305	1	12	2	2
5	187935	691142	116.616635	1.450483	1	1	115.616635	2	R	1.5	3	1	Site Infrastructure	3	116.591757	1.371711	4	0.024878	1	12	2	2
6	187959	691158	116.550606	1.084505	1	1.2	115.350606	3	G	1	3	1	Site Infrastructure	3	116.561176	0.953369	4	-0.01057	1	12	2	2
7	187957	691188	116.623072	1.626071	1	2.9	113.723072	3	G	1	3	1	Site Infrastructure	3	116.644858	1.199784	4	-0.021786	1	12	2	2
8	187953	691226	117.782318	1.885015	1	3	114.782318	3	G	1	3	1	Site Infrastructure	3	117.720254	1.542555	4	0.062064	1	12	2	2
9	187933	691240	117.943261	1.597476	1	3.3	114.643261	8	G	1	8	2	Site Infrastructure	3	117.923904	1.43968	4	0.019357	1	12	2	4
10	187917	691219	116.561069	4.423969	4	3	113.561069	3	R	1.5	18	3	Site Infrastructure	3	116.527063	0.414823	4	0.034006	1	12	2	6
11	187936	691201	116.808317	2.736889	2	2.9	113.908317	3	G	1	6	2	Site Infrastructure	3	116.803986	0.196802	4	0.004331	1	12	2	4
12	187936	691169	116.624055	0.794571	1	1.2	115.424055	3	G	1	3	1	Site Infrastructure	3	116.629154	0.42365	4	-0.005099	1	12	2	2
13	187914	691169	116.883225	0.787418	1	1.1	115.783225	3	G	1	3	1	Site Infrastructure	3	116.895807	1.056698	4	-0.012582	1	12	2	2
14	187895	691187	116.962102	2.016871	2	3	113.962102	3	G	1	6	2	Site Infrastructure	3	116.962762	0.01967	4	-0.00066	1	12	2	4
15	187926	691183	116.710984	0.725498	1	1.7	115.010984	3	G	1	3	1	Site Infrastructure	3	116.713156	0.184776	4	-0.002172	1	12	2	2
16	187907	691203	116.34124	1.789914	1	2.8	113.54124	3	R	1.5	4.5	1	Site Infrastructure	3	116.320885	0.518582	4	0.020355	1	12	2	2
17	187876	691169	117.558928	1.390114	1	2.4	115.158928	3	R	1.5	4.5	1	Site Infrastructure	3	117.453112	5.769525	4	0.105816	1	12	2	2
18	187861	691149	117.226094	1.597011	1	1.4	115.826094	3	G	1	3	1	Site Infrastructure	3	117.092908	6.766164	4	0.133186	1	12	2	2
19	187847	691134	116.981779	1.591453	1	1	115.981779	2	R	1.5	3	1	Site Infrastructure	3	116.864909	9.087227	4	0.11687	1	12	2	2
20	187868	691117	116.548835	0.597362	1	0.8	115.748835	2	G	1	2	1	Site Infrastructure	3	116.543102	0.532179	4	0.005733	1	12	2	2
21	187886	691099	116.433047	0.882157	1	0.8	115.633047	2	G	1	2	1	Site Infrastructure	3	116.423398	0.87402	4	0.009649	1	12	2	2
22	187906	691083	116.030004	1.478631	1	1	115.030004	2	G	1	2	1	Site Infrastructure	3	116.018455	0.980609	4	0.011549	1	12	2	2
23	187923	691070	115.68442	1.482351	1	0.9	114.78442	2	G	1	2	1	Site Infrastructure	3	115.664451	0.792767	4	0.019969	1	12	2	2
24	187942	691055	115.302719	1.466115	1	0.5	114.802719	1	G	1	1	1	Site Infrastructure	3	115.310451	0.377192	4	-0.007732	1	12	2	2
25	187936	691043	115.018197	1.432096	1	0.2	114.818197	1	G	1	1	1	Site Infrastructure	3	115.007803	0.467311	4	0.010394	1	12	2	2
26	187916	691056	115.330626	1.484986	1	0.9	114.430626	2	G	1	2	1	Site Infrastructure	3	115.306376	1.005818	4	0.02425	1	12	2	2
27	187899	691070	115.701394	1.469244	1	0.4	115.301394	1	G	1	1	1	Site Infrastructure	3	115.68003	0.865737	4	0.021364	1	12	2	2
28	187878	691087	116.172267	1.165208	1	0.4	115.772267	1	G	1	1	1	Site Infrastructure	3	116.176428	0.249211	4	-0.004161	1	12	2	2
29	187857	691099	116.332767	0.619531	1	0.6	115.732767	2	G	1	2	1	Site Infrastructure	3	116.333156	0.53272	4	-0.000389	1	12	2	2
30	187844	691113	116.469305	1.351186	1	0.9	115.569305	2	G	1	2	1	Site Infrastructure	3	116.434695	1.700536	4	0.03461	1	12	2	2
31	187820	691099	116.414188	2.284247	2	0.4	116.014188	1	G	1	2	1	Site Infrastructure	3	116.209278	11.699815	3	0.20491	1	9	1	1
32	187826	691085	116.05973	1.123093	1	1	115.05973	2	G	1	2	1	Site Infrastructure	3	116.060531	0.314413	4	-0.000801	1	12	2	2
33	187844	691074	115.875008	1.169644	1	0.2	115.675008	1	G	1	1	1	Site Infrastructure	3	115.886501	0.989453	4	-0.011493	1	12	2	2
34	187864	691057	115.541993	1.210343	1	0.9	114.641993	2	G	1	2	1	Site Infrastructure	3	115.541626	1.816667	4	0.000367	1	12	2	2
35	187885	691045	115.147675	1.499522	1	0.1	115.047675	1	G	1	1	1	Site Infrastructure	3	115.15268	0.4518	4	-0.005005	1	12	2	2
36	187906	691027	114.57979	1.482288	1	0.9	113.67979	2	G	1	2	1	Site Infrastructure	3	114.632603	2.132825	4	-0.052813	1	12	2	2
37	187786	691056	115.128393	2.654789	2	1.2	113.928393	3	G	1	6	2	Site Infrastructure	3	114.620762	15.119799	3	0.507631	1	9	1	2
38	187796	691056	115.095607	1.906148	1	0.3	114.795607	1	G	1	1	1	Site Infrastructure	3	114.514253	20.582973	3	0.581354	1	9	1	1
39	187806	691046	114.834242	1.743317	1	0.7	114.134242	2	G	1	2	1	Site Infrastructure	3	114.319604	17.950722	3	0.514638	1	9	1	1
40	187815	691042	114.735159	1.745988	1	0.7	114.035159	2	G	1	2	1	Site Infrastructure	3	114.2236	19.271583	3	0.511559	1	9	1	1
41	187807	691036	114.524532	1.783564	1	0.9	113.624532	2	G	1	2	1	Site Infrastructure	3	114.2236	10.130795	3	0.300932	1	9	1	1
42	187797	691036	114.48266	1.777419	1	0.8	113.68266	2	G	1	2	1	Site Infrastructure	3	114.363601	4.784343	4	0.119059	1	12	2	2
43	187797	691046	114.784766	1.749353	1	0.7	114.084766	2	G	1	2	1	Site Infrastructure	3	114.415601	12.407223	3	0.369165	1	9	1	1
44	187797	691026	114.185756	1.745118	1	0.1	114.085756	1	G	1	1	1	Site Infrastructure	3	114.199602	0.947946	4	-0.013846	1	12	2	2
45	187797	691017	113.882816	1.781149	1	0.3	113.582816	1	G	1	1	1	Site Infrastructure	3	113.889605	0.71633	4	-0.006789	1	12	2	2
46	187787	691026	114.133975	1.749663	1	0.7	113.433975	2	G	1	2	1	Site Infrastructure	3	114.159602	1.109608	4	-0.025627	1	12	2	2
47	187776	691026	114.098113	1.747784	1	0.3	113.798113	1	G	1	1	1	Site Infrastructure	3	114.111602	1.127054	4	-0.013489	1	12	2	2
48	187767	691026	114.058903	1.870367	1	0.8	113.258903	2	G	1	2	1	Site Infrastructure	3	114.0796	0.721702	4	-0.020697	1	12	2	2
49	187776	691036	114.398114	1.925614	1	0.4	113.998114	1	G	1	1	1	Site Infrastructure	3	114.411602	1.127054	4	-0.013488	1	12	2	2
50	187786	691036	114.438115	1.77609	1	1.1	113.338115	3	G	1	3	1	Site Infrastructure	3	114.451603	1.127054	4	-0.013488	1	12	2	2
51	187786	691046	114.741173	1.890267	1	0.3	114.441173	1	G	1	1	1	Site Infrastructure	3	114.562253	7.15215	4	0.17892	1	12	2	2
52	187806	691026	114.218114	1.747799	1	0.1	114.118114	1	G	1	1	1	Site Infrastructure	3	114.171601	1.719108	4	0.046513	1	12	2	2
53	187777	691046	114.790245	2.688094	2	0.9	113.890245	2	G	1	4	1	Site Infrastructure	3	114.735202	1.961959	4	0.055043	1	12	2	2
54	187766	691036	114.454453	2.74921	2	0.7	113.754453	2	G	1	4	1	Site Infrastructure	3	114.498862	1.127054	4	-0.044409	1	12	2	2
55	187756	691026	114.128472	2.817245	2	0.9	113.228472	2	G	1	4	1	Site Infrastructure	3	114.162389	0.877046	4	-0.033917	1	12	2	2
56	187756	691036	114.596224	3.023035	2	0.1	114.496224	1	G	1	2	1	Site Infrastructure	3	114.662939	1.390112	4	-0.066715	1	12	2	2
57	187767	691046	114.953257	3.022683	2	1	113.953257	2	G	1	4	1	Site Infrastructure	3	114.966861	0.850035	4	-0.013604	1	12	2	2
58	187757	691047	115.132841	3.023035	2	1.3	113.832841	3	G	1	6	2	Site Infrastructure	3	115.126941	0.884214	4	0.0059	1	12	2	4
59	187747	691047	115.303453	3.00809	2	1.3	114.003453	3	G	1	6	2	Site Infrastructure	3	115.296863	0.795464	4	0.00659	1	12	2	4
60	187766	691056	115.454453	3.013954	2	1.4	114.054453	3	G	1	6	2	Site Infrastructure	3	115.298862	3.55499	4	0.155591	1	12	2	4
61	187776	691056	115.288279	3.019661	2	1.1	114.188279	3	G	1	6	2	Site Infrastructure	3	114.997039	8.753919	4	0.29124	1	12	2	4
62	187776	691066	115.810646	3.023035	2	1.4	114.410646	3	G	1	6	2	Site Infrastructure	3	115.298862	17.095145	3	0.511784	1	9	1	2
63	187766	691067	115.976429	3.009808	2	1.4	114.576429	3	G	1	6	2	Site Infrastructure	3	115.600117	11.877108	3	0.376312	1	9	1	2
64	187757	691056	115.622475	3.045975	2	1.3	114.322475	3	G	1	6	2	Site Infrastructure	3	115.635521	0.932417	4	-0.013046	1	12	2	4
65	187746	691056	115.786059	3.034124	2	1.2	114.586059	3	G	1	6	2	Site Infrastructure	3	115.832388	1.127053	4	-0.046329	1	12	2	4
66	187746	691066	116.286595	3.023035	2	1.5	114.786595	3	G	1	6	2	Site Infrastructure	3	116.332938	1.127053	4	-0.046343	1	12	2	4
67	187756	691066	116.124452	3.019203	2	1.2	114.924452	3	G	1	6	2	Site Infrastructure	3	115.900861	6.179424	4	0.223591	1	12	2	4
68	187766	691076	116.454453	3.023888	2	0.3	116.154453	1	G	1	2	1	Site Infrastructure	3	115.900861	20.145672	3	0.553592	1	9	1	1
69	187756	691076	116.624452	3.02737	2	2	114.624452	3	G	1	6	2	Site Infrastructure	3	116.332938	14.45622	3	0.291514	1	9	1	2
70	187747	691076	116.778621	3.040812	2	1.4	115.378621	3	G	1	6	2	Site Infrastructure	3	116.634861	8.999595	4	0.14376	1	12	2	4
71	187737	691076	116.948237	3.022506	2	1.6	115.348237	3	G	1	6	2	Site Infrastructure	3	116.930863	3.491754	4	0.017374	1	12	2	4
72	187746	691086	117.305847	3.024065	2	0.9	116.405847	2	G	1	4	1	Site Infrastructure	3	116.634861	17.04285	3	0.670986	1	9	1	1
73	187736	691087	117.471149	3.025636	2	2	115.471149	3	G	1	6	2	Site Infrastructure	3	117.23686	11.748202	3	0.234289	1	9	1	2
74	187727	691086	117.626632	3.011831	2	2	115.626632	3	R	1.5	9	2	Site Infrastructure	3	117.534936	6.299882	4	0.091696	1	12	2	4
75	187736	691096	117.956593	3.023035	2	2.2	115.756593	3	G	1	6	2	Site Infrastructure	3	117.23686	19.590844	3	0.719733	1	9	1	2
76	187726	691096	118.124452	3.008971	2	2.1	116.024452	3	G	1	6	2	Site Infrastructure	3	117.534936	14.308946	3	0.589516	1	9	1	2
77	187720	691101	118.47463	3.023035	2	2.4	116.07463	3	G	1	6	2	Site Infrastructure	3	117.970859	14.294225	3	0.503771	1	9	1	2
78	187716	691096	118.29445	3.01871	2	2.2	116.09445	3	G	1	6	2	Site Infrastructure	3	117.970859	7.99143	4	0.323591	1	12	2	4
79	187717	691087	117.804681	3.02519	2	2.2	115.604681	3	G	1	6	2	Site Infrastructure	3	117.838858	1.191355	4	-0.034177	1	12	2	4
80	187716	691077	117.313476	3.033917	2	1.9	115.413476	3	R	1.5	9	2	Site Infrastructure	3	117.333488	0.88951	4	-0.020012	1	12	2	4
81	187726	691076	117.124452	3.02737	2	2	115.124452	3	G	1	6	2	Site Infrastructure	3	117.16886	1.127053	4	-0.044408	1	12	2	4
82	187716	691066	116.791243	3.006524	2	1.5	115.291243	3	R	1.5	9	2	Site Infrastructure	3	116.838364	1.127053	4	-0.047121	1	12	2	4
83	187726	691066	116.624452	3.017239	2	1.3	115.324452	3	G	1	6	2	Site Infrastructure	3	116.66886	1.127053	4	-0.044408	1	12	2	4
84	187735	691069	116.607426	3.01381	2	1	115.607426	2	G	1	4	1	Site Infrastructure	3	116.598862	0.387549	4	0.008564	1	12	2	2
85	187736	691056	115.95188	3.026608	2	1.2	114.75188	3	G	1	6	2	Site Infrastructure	3	115.998862	1.014079	4	-0.046982	1	12	2	4
86	187736	691046	115.454453	3.017718	2	0.9	114.554453	2	G	1	4	1	Site Infrastructure	3	115.498862	1.127053	4	-0.044409	1	12	2	2
87	187726	691047	115.637374	2.990806	2	1.2	114.437374	3	G	1	6	2	Site Infrastructure	3	115.668365	0.908383	4	-0.030991	1	12	2	4
88	187726	691056	116.122482	3.046201	2	1.1	115.022482	3	G	1	6	2	Site Infrastructure	3	116.168061	1.127053	4	-0.045579	1	12	2	4
89	187716	691056	116.301427	3.026324	2	1.3	115.001427	3	G	1	6	2	Site Infrastructure	3	116.357561	1.1441	4	-0.056134	1	12	2	4
90	187706	691056	116.511244	3.00141	2	1.4	115.111244	3	G	1	6	2	Site Infrastructure	3	116.558365	1.127053	4	-0.047121	1	12	2	4
91	187706	691066	116.985976	3.027393	2	1.3	115.685976	3	G	1	6	2	Site Infrastructure	3	117.007024	1.300027	4	-0.021048	1	12	2	4
92	187696	691056	116.718737	3.23139	2	0.7	116.018737	2	G	1	4	1	Site Infrastructure	3	116.767015	1.127053	4	-0.048278	1	12	2	2
93	187696	691046	116.23124	3.158867	2	0.7	115.53124	2	G	1	4	1	Site Infrastructure	3	116.278362	1.127053	4	-0.047122	1	12	2	2
94	187686	691046	116.78005	5.468333	4	0.1	116.68005	1	G	1	4	1	Site Infrastructure	3	116.874242	0.927671	4	-0.094192	1	12	2	2
95	187677	691046	117.631669	5.898522	4	0.6	117.031669	2	G	1	8	2	Site Infrastructure	3	117.56964	0.978244	4	0.062029	1	12	2	4
96	187685	691055	117.316752	5.623338	4	0.1	117.216752	1	R	1.5	6	2	Site Infrastructure	3	117.280241	0.527513	4	0.036511	1	12	2	4
97	187686	691036	116.249023	5.369132	4	0.3	115.949023	1	G	1	4	1	Site Infrastructure	3	116.364242	1.127053	4	-0.115219	1	12	2	2
98	187676	691036	117.165473	6.251254	4	0.3	116.865473	1	G	1	4	1	Site Infrastructure	3	117.293096	1.127053	4	-0.127623	1	12	2	2
99	187696	691036	115.750375	3.21488	2	0.8	114.950375	2	G	1	4	1	Site Infrastructure	3	115.797564	0.977728	4	-0.047189	1	12	2	2
100	187706	691036	115.541243	2.997723	2	0.8	114.741243	2	G	1	4	1	Site Infrastructure	3	115.588364	1.127053	4	-0.047121	1	12	2	2
101	187706	691046	116.019135	3.026911	2	0.8	115.219135	2	G	1	4	1	Site Infrastructure	3	116.077562	1.219279	4	-0.058427	1	12	2	2
102	187717	691046	115.815857	2.995761	2	0.2	115.615857	1	G	1	2	1	Site Infrastructure	3	115.828364	0.917464	4	-0.012507	1	12	2	2
103	187716	691036	115.330136	3.001232	2	1	114.330136	2	G	1	4	1	Site Infrastructure	3	115.388362	1.239557	4	-0.058226	1	12	2	2
104	187727	691036	115.13762	3.030465	2	1.2	113.93762	3	G	1	6	2	Site Infrastructure	3	115.138427	0.970222	4	-0.000807	1	12	2	4
105	187736	691036	114.954453	3.017996	2	1	113.954453	2	G	1	4	1	Site Infrastructure	3	114.998862	1.127053	4	-0.044409	1	12	2	2
106	187746	691036	114.784455	3.008971	2	0.9	113.884455	2	G	1	4	1	Site Infrastructure	3	114.828864	1.127053	4	-0.044409	1	12	2	2
107	187746	691026	114.284455	3.025809	2	0.7	113.584455	2	G	1	4	1	Site Infrastructure	3	114.328864	1.127053	4	-0.044409	1	12	2	2
108	187736	691026	114.455159	3.035849	2	0.2	114.255159	1	G	1	2	1	Site Infrastructure	3	114.502686	1.127053	4	-0.047527	1	12	2	2
109	187726	691026	114.651243	2.989589	2	1.1	113.551243	3	G	1	6	2	Site Infrastructure	3	114.698364	1.127053	4	-0.047121	1	12	2	4
110	187716	691026	114.852846	3.026061	2	0.4	114.452846	1	G	1	2	1	Site Infrastructure	3	114.901888	1.127053	4	-0.049042	1	12	2	2
111	187707	691026	115.046674	3.023246	2	0.8	114.246674	2	G	1	4	1	Site Infrastructure	3	115.067022	1.192115	4	-0.020348	1	12	2	2
112	187697	691026	115.251107	3.089751	2	0.2	115.051107	1	G	1	2	1	Site Infrastructure	3	115.268365	0.953481	4	-0.017258	1	12	2	2
113	187686	691026	115.744383	5.393696	4	0.3	115.444383	1	G	1	4	1	Site Infrastructure	3	115.861618	1.127053	4	-0.117235	1	12	2	2
114	187676	691026	116.697514	6.263097	4	0.2	116.497514	1	G	1	4	1	Site Infrastructure	3	116.822263	1.127053	4	-0.124749	1	12	2	2
115	187667	691026	117.39826	6.417167	4	0.7	116.69826	2	G	1	8	2	Site Infrastructure	3	117.421839	0.859281	4	-0.023579	1	12	2	4
116	187667	691017	116.637565	6.310604	4	0.6	116.037565	2	G	1	8	2	Site Infrastructure	3	116.534533	0.994425	4	0.103032	1	12	2	4
117	187656	691016	117.261088	6.805756	4	0.3	116.961088	1	G	1	4	1	Site Infrastructure	3	117.378914	1.127053	4	-0.117826	1	12	2	2
118	187656	691006	116.496338	6.604898	4	0.3	116.196338	1	G	1	4	1	Site Infrastructure	3	116.694933	1.289372	4	-0.198595	1	12	2	2
119	187666	691006	115.92612	3.77215	2	0.5	115.42612	1	G	1	2	1	Site Infrastructure	3	115.990325	1.127053	4	-0.064205	1	12	2	2
120	187676	691006	115.39612	3.435067	2	0.4	114.99612	1	G	1	2	1	Site Infrastructure	3	115.460324	1.127053	4	-0.064204	1	12	2	2
121	187676	691016	115.866964	5.815766	4	0.7	115.166964	2	G	1	8	2	Site Infrastructure	3	115.981336	1.127053	4	-0.114372	1	12	2	4
122	187686	691016	115.213317	4.732009	4	0.4	114.813317	1	R	1.5	6	2	Site Infrastructure	3	115.309082	1.127053	4	-0.095765	1	12	2	4
123	187686	691006	114.860231	3.306993	2	0.7	114.160231	2	G	1	4	1	Site Infrastructure	3	114.925199	1.127053	4	-0.064968	1	12	2	2
124	187696	690997	114.111037	2.917818	2	0.1	114.011037	1	G	1	2	1	Site Infrastructure	3	114.164647	0.922175	4	-0.05361	1	12	2	2
125	187696	691007	114.41944	2.563276	2	0.4	114.01944	1	G	1	2	1	Site Infrastructure	3	114.3969	1.031401	4	0.02254	1	12	2	2
126	187696	691016	114.795561	2.934683	2	0.4	114.395561	1	G	1	2	1	Site Infrastructure	3	114.791072	1.039727	4	0.004489	1	12	2	2
127	187707	691016	114.557231	2.854579	2	1.1	113.457231	3	G	1	6	2	Site Infrastructure	3	114.579723	1.291195	4	-0.022492	1	12	2	4
128	187706	691006	114.165782	2.415537	2	0.7	113.465782	2	G	1	4	1	Site Infrastructure	3	114.220535	1.332514	4	-0.054753	1	12	2	2
129	187707	690996	113.809443	2.419949	2	1.4	112.409443	3	G	1	6	2	Site Infrastructure	3	113.816535	1.169221	4	-0.007092	1	12	2	4
130	187716	690996	113.590567	2.46113	2	1.4	112.190567	3	G	1	6	2	Site Infrastructure	3	113.634615	1.127053	4	-0.044048	1	12	2	4
131	187717	691006	113.949201	2.469926	2	1.8	112.149201	3	G	1	6	2	Site Infrastructure	3	113.956541	0.888054	4	-0.00734	1	12	2	4
132	187716	691016	114.371244	2.928108	2	1.4	112.971244	3	G	1	6	2	Site Infrastructure	3	114.418365	1.127053	4	-0.047121	1	12	2	4
133	187727	691016	114.152374	2.985881	2	1.4	112.752374	3	R	1.5	9	2	Site Infrastructure	3	114.168426	1.08992	4	-0.016052	1	12	2	4
134	187736	691016	113.961242	2.986099	2	1	112.961242	2	G	1	4	1	Site Infrastructure	3	114.008362	1.127053	4	-0.04712	1	12	2	2
135	187746	691016	113.789624	2.800817	2	0.9	112.889624	2	G	1	4	1	Site Infrastructure	3	113.828864	0.921039	4	-0.03924	1	12	2	2
136	187746	691006	113.368987	2.076017	2	1	112.368987	2	G	1	4	1	Site Infrastructure	3	113.39058	1.127053	4	-0.021593	1	12	2	2
137	187756	691006	113.401923	1.818484	1	1.3	112.101923	3	G	1	3	1	Site Infrastructure	3	113.42025	1.000769	4	-0.018327	1	12	2	2
138	187747	690996	113.032822	2.018099	2	1.1	111.932822	3	G	1	6	2	Site Infrastructure	3	113.046967	0.959107	4	-0.014145	1	12	2	4
139	187756	690996	113.080956	1.93954	1	1.1	111.980956	3	G	1	3	1	Site Infrastructure	3	113.094824	1.127054	4	-0.013868	1	12	2	2
140	187756	690987	112.748829	2.006881	2	1.5	111.248829	3	G	1	6	2	Site Infrastructure	3	112.754277	0.917764	4	-0.005448	1	12	2	4
141	187746	690986	112.672563	2.048204	2	0.8	111.872563	2	G	1	4	1	Site Infrastructure	3	112.688351	1.127053	4	-0.015788	1	12	2	2
142	187746	690976	112.322426	2.012579	2	1.4	110.922426	3	G	1	6	2	Site Infrastructure	3	112.356813	1.280991	4	-0.034387	1	12	2	4
143	187746	690966	111.988723	2.018932	2	1.6	110.388723	3	G	1	6	2	Site Infrastructure	3	112.006825	1.060063	4	-0.018102	1	12	2	4
144	187746	690956	111.640423	2.006152	2	2	109.640423	3	G	1	6	2	Site Infrastructure	3	111.654278	1.127053	4	-0.013855	1	12	2	4
145	187746	690946	111.284468	2.014605	2	2.1	109.184468	3	G	1	6	2	Site Infrastructure	3	111.304823	1.082941	4	-0.020355	1	12	2	4
146	187747	690940	111.077983	2.006373	2	2.1	108.977983	3	G	1	6	2	Site Infrastructure	3	111.044826	0.983584	4	0.033157	1	12	2	4
147	187736	690966	112.068423	2.345522	2	1.8	110.268423	3	G	1	6	2	Site Infrastructure	3	112.110535	1.127053	4	-0.042112	1	12	2	4
148	187737	690976	112.427522	2.384529	2	1.2	111.227522	3	G	1	6	2	Site Infrastructure	3	112.426534	0.926926	4	0.000988	1	12	2	4
149	187736	690986	112.788423	2.412013	2	0.1	112.688423	1	G	1	2	1	Site Infrastructure	3	112.830535	1.127053	4	-0.042112	1	12	2	2
150	187736	690996	113.15692	2.415885	2	0.6	112.55692	2	G	1	4	1	Site Infrastructure	3	113.190536	1.044438	4	-0.033616	1	12	2	2
151	187736	691006	113.515764	2.594341	2	0.6	112.915764	2	G	1	4	1	Site Infrastructure	3	113.506536	1.049104	4	0.009228	1	12	2	2
152	187726	691006	113.730591	2.512869	2	1.5	112.230591	3	G	1	6	2	Site Infrastructure	3	113.770538	0.996883	4	-0.039947	1	12	2	4
153	187726	690996	113.361217	2.419012	2	1.6	111.761217	3	G	1	6	2	Site Infrastructure	3	113.410537	1.218965	4	-0.04932	1	12	2	4
154	187726	690986	113.011693	2.415885	2	1.9	111.111693	3	G	1	6	2	Site Infrastructure	3	113.050536	0.963495	4	-0.038843	1	12	2	4
155	187717	690986	113.217673	2.449469	2	1.8	111.417673	3	G	1	6	2	Site Infrastructure	3	113.226603	0.790986	4	-0.00893	1	12	2	4
156	187706	690986	113.478155	2.525726	2	0.4	113.078155	1	G	1	2	1	Site Infrastructure	3	113.503289	0.656159	4	-0.025134	1	12	2	2
157	187696	690986	113.884657	3.271477	2	1.6	112.284657	3	G	1	6	2	Site Infrastructure	3	113.935197	0.931239	4	-0.05054	1	12	2	4
158	187686	690986	114.408268	3.309112	2	1.2	113.208268	3	G	1	6	2	Site Infrastructure	3	114.365781	1.020839	4	0.042487	1	12	2	4
159	187686	690996	114.630229	3.329629	2	0.8	113.830229	2	G	1	4	1	Site Infrastructure	3	114.695199	1.127053	4	-0.06497	1	12	2	2
160	187676	690996	115.176256	3.290936	2	1	114.176256	2	G	1	4	1	Site Infrastructure	3	115.230323	0.977252	4	-0.054067	1	12	2	2

1 TO 4	Negligible
5 TO10	Low
11 TO 16	Medium
17 TO 25	High

161	187666	690996	115.683122	3.015536	2	0.9	114.783122	2	G	1	4	1	Site Infrastructure	3	115.726868	0.917565	4	-0.043746	1	12	2	2
162	187656	690996	115.966031	3.27529	2	0.4	115.566031	1	G	1	2	1	Site Infrastructure	3	115.959863	1.046679	4	0.006168	1	12	2	2
163	187656	690986	115.498568	2.958487	2	0.4	115.098568	1	G	1	2	1	Site Infrastructure	3	115.548415	1.127053	4	-0.049847	1	12	2	2
164	187647	690996	116.350832	9.128172	6	0.6	115.750832	2	G	1	12	2	Site Infrastructure	3	116.277565	1.240753	4	0.073267	1	12	2	4
165	187647	690986	115.736095	3.65534	2	1.3	114.436095	3	G	1	6	2	Site Infrastructure	3	115.74155	1.239732	4	-0.005455	1	12	2	4
166	187636	690986	116.354107	10.338776	6	0.1	116.254107	1	G	1	6	2	Site Infrastructure	3	116.596504	1.167617	4	-0.242397	1	12	2	4
167	187647	690976	115.297676	3.01966	2	1.3	113.997676	3	G	1	6	2	Site Infrastructure	3	115.289863	1.015653	4	0.007813	1	12	2	4
168	187637	690976	115.573945	4.222692	4	0.1	115.473945	1	G	1	4	1	Site Infrastructure	3	115.566268	0.950362	4	0.007677	1	12	2	2
169	187656	690966	114.600951	2.959343	2	0.3	114.300951	1	G	1	2	1	Site Infrastructure	3	114.637865	0.94469	4	-0.036914	1	12	2	2
170	187656	690976	115.048031	2.950759	2	1.3	113.748031	3	G	1	6	2	Site Infrastructure	3	115.097864	1.127053	4	-0.049833	1	12	2	4
171	187667	690966	114.354691	2.962849	2	1.2	113.154691	3	G	1	6	2	Site Infrastructure	3	114.349862	0.973479	4	0.004829	1	12	2	4
172	187666	690976	114.817377	2.929945	2	1.4	113.417377	3	G	1	6	2	Site Infrastructure	3	114.809861	1.05105	4	0.007516	1	12	2	4
173	187667	690986	115.25704	2.920916	2	1.2	114.05704	3	G	1	6	2	Site Infrastructure	3	115.259865	0.95572	4	-0.002825	1	12	2	4
174	187677	690987	114.929308	3.142356	2	1.6	113.329308	3	G	1	6	2	Site Infrastructure	3	114.895664	0.907017	4	0.033644	1	12	2	4
175	187676	690976	114.5827	2.902726	2	1.4	113.1827	3	G	1	6	2	Site Infrastructure	3	114.617864	0.880046	4	-0.035164	1	12	2	4
176	187676	690966	114.123021	2.969783	2	1.3	112.823021	3	G	1	6	2	Site Infrastructure	3	114.157865	0.848895	4	-0.034844	1	12	2	4
177	187687	690966	113.853652	2.918739	2	1.7	112.153652	3	G	1	6	2	Site Infrastructure	3	113.869865	1.171345	4	-0.016213	1	12	2	4
178	187686	690976	114.178037	3.194307	2	0.6	113.578037	2	G	1	4	1	Site Infrastructure	3	114.237575	1.051645	4	-0.059538	1	12	2	2
179	187696	690977	113.675965	3.310274	2	1.9	111.775965	3	G	1	6	2	Site Infrastructure	3	113.710324	0.60455	4	-0.034359	1	12	2	4
180	187696	690966	113.43021	3.246392	2	1.7	111.73021	3	G	1	6	2	Site Infrastructure	3	113.480323	0.895275	4	-0.050113	1	12	2	4
181	187706	690967	112.893127	3.198238	2	2	110.893127	3	G	1	6	2	Site Infrastructure	3	112.945199	0.892982	4	-0.052072	1	12	2	4
182	187706	690976	113.133356	2.819066	2	1.9	111.233356	3	G	1	6	2	Site Infrastructure	3	113.10154	1.096215	4	0.031816	1	12	2	4
183	187716	690976	112.864923	2.422373	2	1.8	111.064923	3	G	1	6	2	Site Infrastructure	3	112.910537	1.129346	4	-0.045614	1	12	2	4
184	187727	690975	112.609914	2.415885	2	2.3	110.309914	3	G	1	6	2	Site Infrastructure	3	112.574535	0.865972	4	0.035379	1	12	2	4
185	187727	690967	112.299042	2.415885	2	2	110.299042	3	R	1.5	9	2	Site Infrastructure	3	112.286535	0.74426	4	0.012507	1	12	2	4
186	187716	690966	112.508961	2.460078	2	0.7	111.808961	2	G	1	4	1	Site Infrastructure	3	112.551087	1.127053	4	-0.042126	1	12	2	2
187	187707	690956	112.645938	3.291077	2	2.2	110.445938	3	G	1	6	2	Site Infrastructure	3	112.615781	0.951521	4	0.030157	1	12	2	4
188	187697	690957	113.149629	2.995662	2	1.2	111.949629	3	G	1	6	2	Site Infrastructure	3	113.135539	0.916235	4	0.01409	1	12	2	4
189	187687	690957	113.420454	2.91577	2	1.6	111.820454	3	G	1	6	2	Site Infrastructure	3	113.411216	0.972523	4	0.009238	1	12	2	4
190	187676	690956	113.639723	2.922778	2	1.5	112.139723	3	G	1	6	2	Site Infrastructure	3	113.699215	1.279245	4	-0.059492	1	12	2	4
191	187667	690957	113.905599	2.936985	2	1.1	112.805599	3	G	1	6	2	Site Infrastructure	3	113.899864	0.488211	4	0.005735	1	12	2	4
192	187657	690956	114.145505	2.933179	2	1.1	113.045505	3	G	1	6	2	Site Infrastructure	3	114.139863	1.022133	4	0.005642	1	12	2	4
193	187646	690956	114.390944	2.966472	2	1.3	113.090944	3	G	1	6	2	Site Infrastructure	3	114.427866	0.925366	4	-0.036922	1	12	2	4
194	187646	690966	114.841386	2.937143	2	1.1	113.741386	3	G	1	6	2	Site Infrastructure	3	114.879216	1.027431	4	-0.03783	1	12	2	4
195	187636	690967	115.095076	3.188479	2	0.1	114.995076	1	G	1	2	1	Site Infrastructure	3	115.133316	0.862554	4	-0.03824	1	12	2	2
196	187626	690966	115.413358	4.710377	4	0.3	115.113358	1	G	1	4	1	Site Infrastructure	3	115.478272	1.127053	4	-0.064914	1	12	2	2
197	187616	690956	115.268744	4.711101	4	0.4	114.868744	1	G	1	4	1	Site Infrastructure	3	115.332822	1.127053	4	-0.064078	1	12	2	2
198	187614	690952	115.353682	5.841921	4	0.1	115.253682	1	G	1	4	1	Site Infrastructure	3	115.372834	0.460636	4	-0.019152	1	12	2	2
199	187626	690946	114.406955	3.165443	2	0.1	114.306955	1	G	1	2	1	Site Infrastructure	3	114.463315	1.127053	4	-0.05636	1	12	2	2
200	187626	690956	114.903356	3.445996	2	0.8	114.103356	2	G	1	4	1	Site Infrastructure	3	114.96827	1.127053	4	-0.064914	1	12	2	2
201	187636	690956	114.618031	3.001647	2	1.3	113.318031	3	G	1	6	2	Site Infrastructure	3	114.667864	1.127053	4	-0.049833	1	12	2	4
202	187637	690946	114.151361	2.936728	2	0.6	113.551361	2	G	1	4	1	Site Infrastructure	3	114.161216	1.046331	4	-0.009855	1	12	2	2
203	187637	690937	113.71806	3.069226	2	0.8	112.91806	2	G	1	4	1	Site Infrastructure	3	113.709842	0.312554	4	0.008218	1	12	2	2
204	187646	690936	113.474183	2.998566	2	0.7	112.774183	2	G	1	4	1	Site Infrastructure	3	113.517865	0.926797	4	-0.043682	1	12	2	2
205	187646	690946	113.899746	2.953666	2	1.1	112.799746	3	G	1	6	2	Site Infrastructure	3	113.967862	1.385309	4	-0.068116	1	12	2	4
206	187657	690946	113.666843	2.955919	2	0.3	113.366843	1	G	1	2	1	Site Infrastructure	3	113.679864	1.120014	4	-0.013021	1	12	2	2
207	187667	690946	113.441977	2.967809	2	1.7	111.741977	3	G	1	6	2	Site Infrastructure	3	113.439865	0.956034	4	0.002112	1	12	2	4
208	187676	690946	113.207337	2.9701	2	1.6	111.607337	3	G	1	6	2	Site Infrastructure	3	113.247866	0.902542	4	-0.040529	1	12	2	4
209	187686	690946	112.95803	2.970091	2	1.9	111.05803	3	G	1	6	2	Site Infrastructure	3	113.007863	1.127053	4	-0.049833	1	12	2	4
210	187696	690946	112.718031	2.928542	2	2.3	110.418031	3	G	1	6	2	Site Infrastructure	3	112.767865	1.127053	4	-0.049834	1	12	2	4
211	187706	690946	112.443204	3.018825	2	1.9	110.543204	3	R	1.5	9	2	Site Infrastructure	3	112.471494	0.577169	4	-0.02829	1	12	2	4
212	187696	690936	112.258032	2.957431	2	1.9	110.358032	3	G	1	6	2	Site Infrastructure	3	112.307866	1.127053	4	-0.049834	1	12	2	4
213	187686	690936	112.498568	2.95228	2	1.4	111.098568	3	R	1.5	9	2	Site Infrastructure	3	112.548415	1.127053	4	-0.049847	1	12	2	4
214	187676	690936	112.725574	2.919551	2	1.3	111.425574	3	G	1	6	2	Site Infrastructure	3	112.789212	1.315055	4	-0.063638	1	12	2	4
215	187666	690936	112.982144	2.935913	2	1.2	111.782144	3	R	1.5	9	2	Site Infrastructure	3	113.032741	1.127053	4	-0.050597	1	12	2	4
216	187657	690936	113.210292	2.93706	2	1.3	111.910292	3	G	1	6	2	Site Infrastructure	3	113.229866	1.236839	4	-0.019574	1	12	2	4
217	187656	690926	112.726586	3.829468	2	1.3	111.426586	3	G	1	6	2	Site Infrastructure	3	112.798916	1.093704	4	-0.07233	1	12	2	4
218	187666	690926	112.518362	3.334602	2	1.7	110.818362	3	G	1	6	2	Site Infrastructure	3	112.571613	1.127053	4	-0.053251	1	12	2	4
219	187666	690916	111.861238	3.883105	2	1.8	110.061238	3	G	1	6	2	Site Infrastructure	3	111.89754	1.048326	4	-0.036302	1	12	2	4
220	187676	690926	112.28803	3.101521	2	0.2	112.08803	1	G	1	2	1	Site Infrastructure	3	112.337865	1.127053	4	-0.049835	1	12	2	2
221	187676	690916	111.681332	3.950837	2	1.8	109.881332	3	G	1	6	2	Site Infrastructure	3	111.73889	1.127053	4	-0.057558	1	12	2	4
222	187686	690916	111.528819	3.748583	2	1.8	109.728819	3	G	1	6	2	Site Infrastructure	3	111.589415	1.127053	4	-0.060596	1	12	2	4
223	187686	690926	112.048031	2.973729	2	1.7	110.348031	3	G	1	6	2	Site Infrastructure	3	112.097864	1.127053	4	-0.049833	1	12	2	4
224	187696	690927	111.862205	2.924866	2	2	109.862205	3	G	1	6	2	Site Infrastructure	3	111.857862	0.227951	4	0.004343	1	12	2	4
225	187696	690906	110.772738	2.668691	2	2.3	108.472738	3	R	1.5	9	2	Site Infrastructure	3	110.803237	0.903847	4	-0.030499	1	12	2	4
226	187686	690906	110.983438	2.37417	2	2.3	108.683438	3	G	1	6	2	Site Infrastructure	3	111.023237	1.127053	4	-0.039799	1	12	2	4
227	187696	690896	110.457944	1.868065	1	2.7	107.757944	3	G	1	3	1	Site Infrastructure	3	110.490785	1.127053	4	-0.032841	1	12	2	2
228	187706	690896	110.264382	1.818853	1	2.7	107.564382	3	G	1	3	1	Site Infrastructure	3	110.286462	0.784029	4	-0.02208	1	12	2	2
229	187707	690886	110.028568	1.645147	1	2.3	107.728568	3	G	1	3	1	Site Infrastructure	3	110.037262	0.437643	4	-0.008694	1	12	2	2
230	187716	690896	110.060545	1.749697	1	1.6	108.460545	3	G	1	3	1	Site Infrastructure	3	110.08591	0.889269	4	-0.025365	1	12	2	2
231	187716	690906	110.342587	2.774137	2	2.7	107.642587	3	G	1	6	2	Site Infrastructure	3	110.387259	1.172044	4	-0.044672	1	12	2	4
232	187706	690906	110.543438	2.855609	2	0.5	110.043438	1	G	1	2	1	Site Infrastructure	3	110.583235	1.127053	4	-0.039797	1	12	2	2
233	187706	690916	111.106421	3.14406	2	2.2	108.906421	3	G	1	6	2	Site Infrastructure	3	111.156214	1.127053	4	-0.049793	1	12	2	4
234	187696	690916	111.325826	3.428191	2	2	109.325826	3	G	1	6	2	Site Infrastructure	3	111.384864	1.127053	4	-0.059038	1	12	2	4
235	187706	690926	111.562141	2.93591	2	1.1	110.462141	3	G	1	6	2	Site Infrastructure	3	111.612738	1.127053	4	-0.050597	1	12	2	4
236	187706	690936	112.018033	2.949278	2	0.8	111.218033	2	G	1	4	1	Site Infrastructure	3	112.067865	1.127053	4	-0.049832	1	12	2	2
237	187716	690936	111.661287	3.144981	2	1.2	110.461287	3	G	1	6	2	Site Infrastructure	3	111.725372	1.127053	4	-0.064085	1	12	2	4
238	187716	690946	111.89612	3.039688	2	2.3	109.59612	3	G	1	6	2	Site Infrastructure	3	111.960324	1.127053	4	-0.064204	1	12	2	4
239	187726	690956	111.928422	2.4145	2	2.7	109.228422	3	G	1	6	2	Site Infrastructure	3	111.970535	1.127053	4	-0.042113	1	12	2	4
240	187736	690956	111.709765	2.323283	2	2.3	109.409765	3	G	1	6	2	Site Infrastructure	3	111.750538	1.060093	4	-0.040773	1	12	2	4
241	187736	690946	111.355047	2.314351	2	2.7	108.655047	3	G	1	6	2	Site Infrastructure	3	111.389741	0.93429	4	-0.034694	1	12	2	4
242	187726	690946	111.576494	2.434335	2	2.5	109.076494	3	G	1	6	2	Site Infrastructure	3	111.610535	1.043578	4	-0.034041	1	12	2	4
243	187726	690936	111.227479	2.57693	2	2.4	108.827479	3	G	1	6	2	Site Infrastructure	3	111.266619	0.907628	4	-0.03914	1	12	2	4
244	187726	690926	110.905044	2.86544	2	2.5	108.405044	3	G	1	6	2	Site Infrastructure	3	110.969222	1.127053	4	-0.064178	1	12	2	4
245	187737	690926	110.615909	2.225101	2	2.8	107.815909	3	G	1	6	2	Site Infrastructure	3	110.616537	0.927764	4	-0.000628	1	12	2	4
246	187737	690936	110.981504	2.265719	2	2.5	108.481504	3	G	1	6	2	Site Infrastructure	3	110.976613	0.968676	4	0.004891	1	12	2	4
247	187726	690916	110.618467	2.950559	2	2.9	107.718467	3	G	1	6	2	Site Infrastructure	3	110.67274	1.084561	4	-0.054273	1	12	2	4
248	187717	690916	110.867853	3.034556	2	2.4	108.467853	3	G	1	6	2	Site Infrastructure	3	110.869865	0.956027	4	-0.002012	1	12	2	4
249	187716	690926	111.320537	2.868268	2	2.3	109.020537	3	G	1	6	2	Site Infrastructure	3	111.369213	1.127053	4	-0.048676	1	12	2	4
250	187716	690956	112.17516	2.708592	2	2.2	109.97516	3	G	1	6	2	Site Infrastructure	3	112.226994	1.013634	4	-0.051834	1	12	2	4
251	187792	690927	109.904388	2.758403	2	1.1	108.804388	3	G	1	6	2	Site Infrastructure	3	110.949559	24.82901	3	-1.045171	1	9	1	2
252	187787	690938	110.506406	2.76299	2	1.2	109.306406	3	G	1	6	2	Site Infrastructure	3	110.949559	14.500618	3	-0.443153	1	9	1	2
253	187838	690945	110.335834	3.866253	2	0.3	110.035834	1	G	1	2	1	Site Infrastructure	3	110.297956	0.771363	4	0.037878	1	12	2	2
254	187883	690965	110.942284	3.823912	2	0.2	110.742284	1	G	1	2	1	Site Infrastructure	3	110.575306	46.899593	3	0.366978	1	9	1	1
255	187928	690953	109.409931	0.722281	1	0.6	108.809931	2	G	1	2	1	Roads and Tracks	3	109.144532	14.05007	3	0.265399	1	9	1	1
256	187726	690886	109.643834	1.662106	1	3	106.643834	3	G	1	3	1	Site Infrastructure	3	109.675911	1.127053	4	-0.032077	1	12	2	2
257	187736	690886	109.443831	1.743365	1	2.6	106.843831	3	R	1.5	4.5	1	Site Infrastructure	3	109.51726	2.753671	4	-0.073429	1	12	2	2
258	187746	690876	108.961574	2.604289	2	2.5	106.461574	3	G	1	6	2	Site Infrastructure	3	108.67702	14.167396	3	0.284554	1	9	1	2
259	187746	690886	109.093834	2.727198	2	2.8	106.293834	3	C	2	12	2	Site Infrastructure	3	109.030774	5.490989	4	0.06306	1	12	2	4
260	187756	690887	108.62635	2.734281	2	2.9	105.72635	3	C	2	12	2	Site Infrastructure	3	108.67702	1.002779	4	-0.05067	1	12	2	4
261	187766	690887	108.383101	3.010908	2	2	106.383101	3	C	2	12	2	Site Infrastructure	3	108.515589	2.462196	4	-0.132488	1	12	2	4
262	187776	690887	108.200417	3.112444	2	1.6	106.600417	3	C	2	12	2	Site Infrastructure	3	108.231589	1.002779	4	-0.031172	1	12	2	4
263	187776	690877	107.694036	2.961592	2	2.2	105.494036	3	C	2	12	2	Site Infrastructure	3	107.987589	6.348155	4	-0.293553	1	12	2	4
264	187786	690877	107.481202	3.419865	2	2	105.481202	3	G	1	6	2	Site Infrastructure	3	107.471767	1.065799	4	0.009435	1	12	2	4
265	187787	690867	107.00199	2.553809	2	1.8	105.20199	3	R	1.5	9	2	Site Infrastructure	3	107.11756	2.532116	4	-0.11557	1	12	2	4
266	187786	690857	106.757115	2.832688	2	2.2	104.557115	3	G	1	6	2	Site Infrastructure	3	107.082902	7.993786	4	-0.325787	1	12	2	4
267	187786	690847	106.694319	3.178382	2	2.2	104.494319	3	R	1.5	9	2	Site Infrastructure	3	107.234917	13.627881	3	-0.540598	1	9	1	2
268	187786	690837	106.627704	2.897583	2	2.2	104.427704	3	G	1	6	2	Site Infrastructure	3	107.43557	20.672939	3	-0.807866	1	9	1	2
269	187776	690827	106.965427	2.477588	2	2.3	104.665427	3	R	1.5	9	2	Site Infrastructure	3	107.43557	24.76403	3	-0.470143	1	9	1	2
270	187776	690837	107.067707	2.581442	2	2.3	104.767707	3	G	1	6	2	Site Infrastructure	3	107.43557	15.10244	3	-0.367863	1	9	1	2
271	187776	690847	107.167705	2.594323	2	2.3	104.867705	3	R	1.5	9	2	Site Infrastructure	3	107.43557	6.545891	4	-0.267865	1	12	2	4
272	187776	690857	107.277706	2.660251	2	2	105.277706	3	G	1	6	2	Site Infrastructure	3	107.322918	1.002779	4	-0.045212	1	12	2	4
273	187776	690867	107.377704	2.626889	2	2.5	104.877704	3	R	1.5	9	2	Site Infrastructure	3	107.22007	3.493497	4	0.157634	1	12	2	4
274	187766	690877	107.986351	2.698184	2	2	105.986351	3	C	2	12	2	Site Infrastructure	3	108.34041	10.701562	3	-0.354059	1	9	1	2
275	187756	690877	108.466352	2.891791	2	2.2	106.266352	3	C	2	12	2	Site Infrastructure	3	108.67702	10.308499	3	-0.210668	1	9	1	2
276	187736	690877	109.242618	1.643767	1	3.1	106.142618	8	G	1	8	2	Site Infrastructure	3	109.42726	7.325063	4	-0.184642	1	12	2	4
277	187726	690876	109.436341	1.633652	1	3	106.436341	3	R	1.5	4.5	1	Site Infrastructure	3	109.467261	1.127053	4	-0.03092	1	12	2	2
278	187726	690867	109.232622	1.657696	1	3	106.232622	3	C	2	6	2	Site Infrastructure	3	109.383912	5.194609	4	-0.15129	1	12	2	4
279	187736	690866	109.026339	1.659695	1	3.1	105.926339	8	C	2	16	3	Site Infrastructure	3	109.387259	12.78716	3	-0.36092	1	9	1	3
280	187746	690867	108.774178	2.405274	2	3.2	105.574178	8	R	1.5	24	3	Site Infrastructure	3	108.209972	13.278237	3	0.564206	1	9	1	3
281	187756	690867	108.314613	2.851026	2	3.2	105.114613	8	G	1	16	3	Site Infrastructure	3	108.143022	7.802816	4	0.171591	1	12	2	6
282	187766	690867	107.837831	2.799019	2	2.2	105.637831	3	R	1.5	9	2	Site Infrastructure	3	107.96267	9.191598	4	-0.124839	1	12	2	4
283	187766	690857	107.717707	2.60882	2	2.8	104.917707	3	G	1	6	2	Site Infrastructure	3	107.850919	2.978715	4	-0.133212	1	12	2	4
284	187759	690855	108.015821	2.658548	2	3.2	104.815821	8	R	1.5	24	3	Site Infrastructure	3	108.006919	0.30056	4	0.008902	1	12	2	6
285	187756	690857	108.161186	2.73013	2	3.5	104.661186	8	G	1	16	3	Site Infrastructure	3	108.209972	1.002779	4	-0.048786	1	12	2	6
286	187746	690857	108.609854	2.149236	2	3.1	105.509854	8	G	1	16	3	Site Infrastructure	3	108.209972	9.035084	4	0.399882	1	12	2	6
287	187738	690856	108.7818	1.770526	1	3.1	105.6818	8	R	1.5	12	2	Site Infrastructure	3	108.18671	17.911383	3	0.59509	1	9	1	2
288	187726	690856	109.013267	1.882969	1	3.2	105.813267	8	C	2	16	3	Site Infrastructure	3	109.340088	11.04986	3	-0.326821	1	9	1	3
289	187726	690847	108.696924	2.207402	2	3.5	105.196924	8	G	1	16	3	Site Infrastructure	3	109.337912	18.570008	3	-0.640988	1	9	1	3
290	187736	690847	108.526924	2.342866	2	3	105.526924	3	G	1	6	2	Site Infrastructure	3	108.163449	20.034008	3	0.363475	1	9	1	2
291	187746	690847	108.333286	2.481265	2	2.8	105.533286	3	G	1	6	2	Site Infrastructure	3	108.163449	10.990718	3	0.169837	1	9	1	2
292	187756	690847	108.050596	2.401491	2	2.7	105.350596	3	G	1	6	2	Site Infrastructure	3	108.054917	4.387157	4	-0.004321	1	12	2	4
293	187766	690847	107.609445	2.616351	2	2.7	104.909445	3	G	1	6	2	Site Infrastructure	3	107.878918	6.545891	4	-0.269473	1	12	2	4
294	187766	690837	107.504892	2.396169	2	2.5	105.004892	3	G	1	6	2	Site Infrastructure	3	107.878918	15.102439	3	-0.374026	1	9	1	2
295	187766	690827	107.258824	2.50198	2	2.5	104.758824	3	R	1.5	9	2	Site Infrastructure	3	107.878918	24.764029	3	-0.620094	1	9	1	2
296	187756	690827	107.193278	3.155854	2	2.2	104.993278	3	R	1.5	9	2	Site Infrastructure	3	108.054917	24.282824	3	-0.861639	1	9	1	2
297	187756	690837	107.749224	2.557626	2	2.8	104.949224	3	G	1	6	2	Site Infrastructure	3	108.054917	14.299725	3	-0.305693	1	9	1	2
298	187746	690837	107.915531	2.893312	2	2.5	105.415531	3	R	1.5	9	2	Site Infrastructure	3	108.054917	18.030446	3	-0.139386	1	9	1	2
299	187746	690827	107.503788	2.982348	2	2.4	105.103788	3	R	1.5	9	2	Site Infrastructure	3	108.054917	26.650898	3	-0.551129	1	9	1	2
300	187736	690827	107.646102	2.804333	2	3	104.646102	3	G	1	6	2	Site Infrastructure	3	108.054917	32.106442	3	-0.408815	1	9	1	2
301	187736	690837	108.121924	2.940219	2	3.4	104.721924	8	R	1.5	24	3	Site Infrastructure	3	108.163449	25.031662	3	-0.041525	1	9	1	3
302	187726	690837	108.347326	2.381179	2	2.2	106.147326	3	R	1.5	9	2	Site Infrastructure	3	109.337912	27.748985	3	-0.990586	1	9	1	2
303	187776	690916	109.69139	2.837217	2	1.4	108.29139	3	G	1	6	2	Site Infrastructure	3	109.759563	13.323737	3	-0.068173	1	9	1	2
304	187796	690926	109.820004	2.764374	2	1	108.820004	2	R	1.5	6	2	Site Infrastructure	3	110.949559	28.321454	3	-1.129555	1	9	1	2
305	187796	690936	110.270002	2.766972	2	1.1	109.170002	3	R	1.5	9	2	Site Infrastructure	3	111.15893	22.755751	3	-0.888928	1	9	1	2
306	187806	690926	109.650005	2.790308	2	0.8	108.850005	2	G	1	4	1	Site Infrastructure	3	110.783953	32.685373	3	-1.133948	1	9	1	1
307	187816	690927	109.49605	2.834316	2	1	108.49605	2	G	1	4	1	Site Infrastructure	3	109.348966	25.389366	3	0.147084	1	9	1	1
308	187826	690927	109.330556	2.932519	2	0.8	108.530556	2	G	1	4	1	Site Infrastructure	3	109.348966	15.62341	3	-0.01841	1	9	1	1
309	187836	690926	109.128176	3.408343	2	0.3	108.828176	1	G	1	2	1	Site Infrastructure	3	109.348966	6.802678	4	-0.22079	1	12	2	2
310	187846	690926	108.988663	4.182558	4	0.5	108.488663	1	R	1.5	6	2	Site Infrastructure	3	109.035835	1.127054	4	-0.047172	1	12	2	4
311	187846	690937	109.746374	4.009719	4	0.4	109.346374	1	G	1	4	1	Site Infrastructure	3	109.770832	2.978717	4	-0.024458	1	12	2	2
312	187836	690936	109.715673	3.656258	2	0.4	109.315673	1	G	1	2	1	Site Infrastructure	3	109.897957	3.980073	4	-0.182284	1	12	2	2
313	187846	690947	110.436115	3.910909	2	0.2	110.236115	1	G	1	2	1	Site Infrastructure	3	110.177958	6.214211	4	0.258157	1	12	2	2
314	187856	690957	111.116377	4.000041	4	0.5	110.616377	1	C	2	8	2	Site Infrastructure	3	110.575306	18.644634	3	0.541071	1	9	1	2
315	187856	690946	110.396905	3.948804	2	0.4	109.996905	1	R	1.5	3	1	Site Infrastructure	3	110.177958	15.351115	3	0.218947	1	9	1	1
316	187846	690956	111.100481	3.916199	2	0.4	110.700481	1	C	2	4	1	Site Infrastructure	3	110.575306	10.177919	3	0.525175	1	9	1	1
317	187856	690967	111.842057	3.925281	2	0.4	111.442057	1	G	1	2	1	Site Infrastructure	3	110.575306	24.809952	3	1.266751	1	9	1	1
318	187858	690976	112.433141	3.824068	2	0.2	112.233141	1	R	1.5	3	1	Site Infrastructure	3	111.087954	30.745875	3	1.345187	1	9	1	1
319	187856	690986	113.068257	2.541058	2	0.3	112.768257	1	C	2	4	1	Site Infrastructure	3	111.215954	37.079404	3	1.852303	1	9	1	1
320	187846	690986	113.019688	2.350235	2	0.2	112.819688	1	C	2	4	1	Site Infrastructure	3	111.215954	31.235504	3	1.803734	1	9	1	1
321	187846	690976	112.450479	3.896828	2	0.3	112.150479	1	G	1	2	1	Site Infrastructure	3	111.215954	22.964458	3	1.234525	1	9	1	1
322	187846	690967	111.793711	3.852215	2	0.3	111.493711	1	G	1	2	1	Site Infrastructure	3	111.087954	16.212674	3	0.705757	1	9	1	1
323	187836	690956	111.06048	3.882554	2	0.1	110.96048	1	G	1	2	1	Site Infrastructure	3	111.087954	3.022819	4	-0.027474	1	12	2	2
324	187836	690966	111.732987	3.840366	2	0.4	111.332987	1	R	1.5	3	1	Site Infrastructure	3	111.215954	8.92904	4	0.517033	1	12	2	2
325	187836	690986	112.994676	2.437193	2	0.2	112.794676	1	G	1	2	1	Site Infrastructure	3	113.444978	27.199445	3	-0.450302	1	9	1	1

326	187836	690976	112.410481	3.896007	2	0.2	112.210481	1	R	1.5	3	1	Site Infrastructure	3	111.215954	18.112965	3	1.194527	1	9	1	1
327	187827	690987	112.993254	2.450175	2	0.2	112.793254	1	C	2	4	1	Site Infrastructure	3	113.232979	19.171489	3	-0.239725	1	9	1	1
328	187826	690976	112.359926	3.883685	2	0.2	112.159926	1	G	1	2	1	Site Infrastructure	3	111.191954	17.295889	3	1.167972	1	9	1	1
329	187826	690966	111.700479	3.850273	2	0.3	111.400479	1	R	1.5	3	1	Site Infrastructure	3	111.191954	7.483037	4	0.508525	1	12	2	2
330	187829	690956	111.003759	3.878266	2	0.4	110.603759	1	G	1	2	1	Site Infrastructure	3	111.071954	1.253491	4	-0.068195	1	12	2	2
331	187826	690946	110.352628	3.653707	2	0.5	109.852628	1	G	1	2	1	Site Infrastructure	3	110.783953	6.648328	4	-0.431325	1	12	2	2
332	187826	690937	109.784312	2.974746	2	0.4	109.384312	1	R	1.5	3	1	Site Infrastructure	3	109.897957	13.22586	3	-0.113645	1	9	1	1
333	187816	690936	109.939469	2.765454	2	0.6	109.339469	2	R	1.5	6	2	Site Infrastructure	3	110.783953	18.876662	3	-0.844484	1	9	1	2
334	187817	690946	110.386595	3.002519	2	0.5	109.886595	1	G	1	2	1	Site Infrastructure	3	110.783953	10.851163	3	-0.397358	1	9	1	1
335	187816	690957	111.00304	3.740024	2	0.8	110.20304	2	R	1.5	6	2	Site Infrastructure	3	111.055954	9.035087	4	-0.052914	1	12	2	4
336	187816	690966	111.660481	3.852545	2	0.6	111.060481	2	G	1	4	1	Site Infrastructure	3	111.191954	11.688587	3	0.468527	1	9	1	1
337	187816	690977	112.351831	3.886131	2	0.5	111.851831	1	G	1	2	1	Site Infrastructure	3	113.02098	16.450566	3	-0.669149	1	9	1	1
338	187816	690986	112.943044	2.628262	2	0.3	112.643044	1	G	1	2	1	Site Infrastructure	3	113.232979	11.049865	3	-0.289935	1	9	1	1
339	187806	690987	112.928605	2.66143	2	0.2	112.728605	1	G	1	2	1	Site Infrastructure	3	113.02098	2.462197	4	-0.092375	1	12	2	2
340	187796	690986	112.887125	2.836657	2	0.3	112.587125	1	G	1	2	1	Site Infrastructure	3	112.917578	1.127054	4	-0.030453	1	12	2	2
341	187796	690977	112.27183	3.8154	2	0.2	112.07183	1	G	1	2	1	Site Infrastructure	3	112.285953	1.00278	4	-0.014123	1	12	2	2
342	187807	690977	112.312593	3.886055	2	0.2	112.112593	1	G	1	2	1	Site Infrastructure	3	112.573954	8.43081	4	-0.261361	1	12	2	2
343	187806	690967	111.642235	3.745534	2	1	110.642235	2	G	1	4	1	Site Infrastructure	3	112.149955	13.730605	3	-0.50772	1	9	1	1
344	187806	690956	111.010005	3.033675	2	0.9	110.110005	2	G	1	4	1	Site Infrastructure	3	111.055954	19.038468	3	-0.045949	1	9	1	1
345	187796	690967	111.644312	3.077681	2	0.5	111.144312	1	R	1.5	3	1	Site Infrastructure	3	111.829087	5.458417	4	-0.184775	1	12	2	2
346	187796	690957	111.193912	2.765156	2	1.1	110.093912	3	G	1	6	2	Site Infrastructure	3	111.625561	10.937216	3	-0.431649	1	9	1	2
347	187796	690947	110.73753	2.762756	2	0.1	110.63753	1	G	1	2	1	Site Infrastructure	3	111.421897	16.535761	3	-0.684367	1	9	1	1
348	187806	690946	110.559467	2.765454	2	0.8	109.759467	2	R	1.5	6	2	Site Infrastructure	3	110.783953	20.134381	3	-0.224486	1	9	1	2
349	187806	690936	110.103578	2.762877	2	0.8	109.303578	2	R	1.5	6	2	Site Infrastructure	3	110.783953	25.236762	3	-0.680375	1	9	1	2
350	187676	690887	110.66739	1.661121	1	2	108.66739	3	G	1	3	1	Site Infrastructure	3	110.727263	4.536234	4	-0.059873	1	12	2	2
351	187686	690886	110.447942	1.671899	1	2.4	108.047942	3	G	1	3	1	Site Infrastructure	3	110.480783	1.127053	4	-0.032841	1	12	2	2
352	187696	690886	110.24634	1.65481	1	2	108.24634	3	R	1.5	4.5	1	Site Infrastructure	3	110.27726	1.127053	4	-0.03092	1	12	2	2
353	187696	690876	110.043836	1.672745	1	2.5	107.543836	3	G	1	3	1	Site Infrastructure	3	110.035913	1.183473	4	0.007923	1	12	2	2
354	187706	690876	109.836338	1.655127	1	2.7	107.136338	3	C	2	6	2	Site Infrastructure	3	109.867259	1.127053	4	-0.030921	1	12	2	4
355	187706	690866	109.633832	1.69377	1	3.1	106.533832	8	C	2	16	3	Site Infrastructure	3	109.62726	3.98007	4	0.006572	1	12	2	6
356	187716	690866	109.433835	1.675386	1	3	106.433835	3	G	1	3	1	Site Infrastructure	3	109.465912	1.127053	4	-0.032077	1	12	2	2
357	187716	690876	109.636339	1.654592	1	2.7	106.936339	3	G	1	3	1	Site Infrastructure	3	109.667259	1.127053	4	-0.03092	1	12	2	2
358	187716	690886	109.846339	1.646242	1	2.2	107.646339	3	G	1	3	1	Site Infrastructure	3	109.877258	1.127053	4	-0.030919	1	12	2	2
359	187726	690896	109.847943	1.6936	1	2.7	107.147943	3	G	1	3	1	Site Infrastructure	3	109.880784	1.127053	4	-0.032841	1	12	2	2
360	187726	690906	110.163381	2.79872	2	2.8	107.363381	3	C	2	12	2	Site Infrastructure	3	110.212436	1.127053	4	-0.049055	1	12	2	4
361	187736	690896	109.646342	1.900641	1	2.8	106.846342	3	C	2	6	2	Site Infrastructure	3	109.677261	1.127053	4	-0.030919	1	12	2	4
362	187736	690906	109.910923	2.506507	2	2.8	107.110923	3	C	2	12	2	Site Infrastructure	3	109.960315	1.127053	4	-0.049392	1	12	2	4
363	187746	690916	110.193586	2.514228	2	2.4	107.793586	3	R	1.5	9	2	Site Infrastructure	3	110.228007	1.127053	4	-0.034421	1	12	2	4
364	187736	690916	110.261644	2.260418	2	3	107.261644	3	G	1	6	2	Site Infrastructure	3	110.303837	1.127053	4	-0.042193	1	12	2	4
365	187746	690926	110.598989	2.175561	2	2.9	107.698989	3	G	1	6	2	Site Infrastructure	3	110.614028	1.127053	4	-0.015039	1	12	2	4
366	187706	691086	117.968737	3.020735	2	2.4	115.568737	3	R	1.5	9	2	Site Infrastructure	3	118.017015	1.127053	4	-0.048278	1	12	2	4
367	187706	691086	117.975057	3.022445	2	2.1	115.875057	3	R	1.5	9	2	Site Infrastructure	3	118.017015	0.792265	4	-0.041958	1	12	2	4
368	187696	691096	118.663015	3.442762	2	2.5	116.163015	3	R	1.5	9	2	Site Infrastructure	3	118.721718	1.127053	4	-0.058703	1	12	2	4
369	187686	691086	118.801526	5.786206	4	2.4	116.401526	3	R	1.5	18	3	Site Infrastructure	3	118.915588	1.127053	4	-0.114062	1	12	2	6
370	187696	691086	118.176591	3.356612	2	2.2	115.976591	3	G	1	6	2	Site Infrastructure	3	118.229488	1.127053	4	-0.052897	1	12	2	4
371	187696	691076	117.682848	3.283952	2	1.8	115.882848	3	R	1.5	9	2	Site Infrastructure	3	117.73189	1.127053	4	-0.049042	1	12	2	4
372	187706	691076	117.48124	2.987955	2	2	115.48124	3	R	1.5	9	2	Site Infrastructure	3	117.528362	1.127053	4	-0.047122	1	12	2	4
373	187696	691066	117.20124	3.206006	2	1.2	116.00124	3	R	1.5	9	2	Site Infrastructure	3	117.24836	1.127053	4	-0.04712	1	12	2	4
374	187686	691066	117.780993	5.659809	4	0.5	117.280993	1	G	1	4	1	Site Infrastructure	3	117.895041	1.127053	4	-0.114048	1	12	2	2
375	187676	691056	118.14742	5.796082	4	0.3	117.84742	1	G	1	4	1	Site Infrastructure	3	118.260717	1.127053	4	-0.113297	1	12	2	2
376	187676	691066	118.659021	5.799085	4	0.3	118.359021	1	G	1	4	1	Site Infrastructure	3	118.774239	1.127053	4	-0.115218	1	12	2	2
377	187666	691056	119.04725	6.205405	4	0.3	118.74725	1	R	1.5	6	2	Site Infrastructure	3	119.173346	1.127053	4	-0.126096	1	12	2	4
378	187666	691046	118.635475	6.48046	4	0.1	118.535475	1	G	1	4	1	Site Infrastructure	3	118.763098	1.127053	4	-0.127623	1	12	2	2
379	187666	691036	118.21471	6.334901	4	0.1	118.11471	1	R	1.5	6	2	Site Infrastructure	3	118.346694	1.127053	4	-0.131984	1	12	2	4
380	187656	691036	119.019978	6.506522	4	0.2	118.819978	1	G	1	4	1	Site Infrastructure	3	119.137835	1.127053	4	-0.117857	1	12	2	2
381	187656	691026	118.122122	6.548901	4	0.5	117.622122	1	G	1	4	1	Site Infrastructure	3	118.241914	1.127053	4	-0.119792	1	12	2	2
382	187646	691026	119.022755	8.197557	6	0.1	118.922755	1	G	1	6	2	Site Infrastructure	3	119.171607	1.127053	4	-0.148852	1	12	2	4
383	187646	691016	118.757059	10.751816	6	0.9	117.857059	2	G	1	12	2	Site Infrastructure	3	118.963282	1.127053	4	-0.206223	1	12	2	4
384	187646	691006	118.124792	12.711852	6	0.7	117.424792	2	G	1	12	2	Site Infrastructure	3	118.394314	1.127053	4	-0.269522	1	12	2	4
385	187636	691016	120.672344	10.079469	6	0.2	120.472344	1	G	1	6	2	Site Infrastructure	3	120.837369	1.127053	4	-0.165025	1	12	2	4
386	187636	690996	118.231623	14.903309	6	0.1	118.131623	1	R	1.5	9	2	Site Infrastructure	3	118.535796	1.127053	4	-0.304173	1	12	2	4
387	187636	691006	119.930554	12.731886	6	0.3	119.630554	1	G	1	6	2	Site Infrastructure	3	120.190711	1.127053	4	-0.260157	1	12	2	4
388	187626	690996	120.153804	13.73651	6	0.01	120.143804	1	R	1.5	9	2	Site Infrastructure	3	120.440291	1.127053	4	-0.286487	1	12	2	4
389	187626	690986	118.201624	15.268386	8	0.01	118.191624	1	R	1.5	12	2	Site Infrastructure	3	118.505798	1.127053	4	-0.304174	1	12	2	4
390	187627	690976	116.169836	10.528455	6	0.01	116.159836	1	R	1.5	9	2	Site Infrastructure	3	116.191401	0.7657	4	-0.021565	1	12	2	4
391	187616	690976	118.069787	12.520879	6	0.01	118.059787	1	G	1	6	2	Site Infrastructure	3	118.263931	1.127053	4	-0.194144	1	12	2	4
392	187616	690986	119.92132	12.941226	6	0.01	119.91132	1	G	1	6	2	Site Infrastructure	3	120.048056	1.127053	4	-0.126736	1	12	2	4
393	187606	690966	116.992994	8.65883	6	0.1	116.892994	1	G	1	6	2	Site Infrastructure	3	117.118082	1.127053	4	-0.125088	1	12	2	4
394	187616	690966	116.227744	10.192129	6	0.01	116.217744	1	R	1.5	9	2	Site Infrastructure	3	116.461449	1.127053	4	-0.233705	1	12	2	4
395	187606	690956	116.050261	5.189589	4	0.1	115.950261	1	R	1.5	6	2	Site Infrastructure	3	116.106856	1.127053	4	-0.056595	1	12	2	4
396	187596	690957	116.880362	5.002655	4	0.01	116.870362	1	R	1.5	6	2	Site Infrastructure	3	116.955479	1.002778	4	-0.075117	1	12	2	4
397	187588	690947	118.001718	5.325594	4	0.01	117.991718	1	R	1.5	6	2	Site Infrastructure	3	117.529324	5.296026	4	0.472394	1	12	2	4
398	187596	690947	117.381017	5.544243	4	0.01	117.371017	1	R	1.5	6	2	Site Infrastructure	3	117.441075	1.002778	4	-0.060058	1	12	2	4
399	187606	690947	116.557118	6.82259	4	0.3	116.257118	1	R	1.5	6	2	Site Infrastructure	3	116.569081	0.309082	4	-0.011963	1	12	2	4
400	187606	690936	116.908627	7.984672	4	0.3	116.608627	1	G	1	4	1	Site Infrastructure	3	116.759902	2.777239	4	0.148725	1	12	2	2
401	187616	690936	114.874105	10.78704	6	0.01	114.864105	1	R	1.5	9	2	Site Infrastructure	3	115.138706	1.127053	4	-0.264601	1	12	2	4
402	187616	690946	114.904526	7.19843	4	0.2	114.704526	1	G	1	4	1	Site Infrastructure	3	115.095751	1.127053	4	-0.191225	1	12	2	2
403	187626	690936	113.9278	3.729581	2	0.4	113.5278	1	G	1	2	1	Site Infrastructure	3	113.985666	1.127053	4	-0.057866	1	12	2	2
404	187616	690926	114.411542	12.494861	6	0.2	114.211542	1	G	1	6	2	Site Infrastructure	3	114.087346	5.490985	4	0.324196	1	12	2	4
405	187626	690926	113.204707	4.902835	4	0.3	112.904707	1	G	1	4	1	Site Infrastructure	3	113.264539	1.127053	4	-0.059832	1	12	2	2
406	187636	690926	113.055243	4.421096	4	0.7	112.355243	2	G	1	8	2	Site Infrastructure	3	113.115088	1.127053	4	-0.059845	1	12	2	4
407	187636	690916	112.393441	2.81198	2	0.7	111.693441	2	R	1.5	6	2	Site Infrastructure	3	112.498232	2.777239	4	-0.104791	1	12	2	4
408	187646	690926	112.908817	4.158706	4	1	111.908817	2	G	1	8	2	Site Infrastructure	3	112.969413	1.127053	4	-0.060596	1	12	2	4
409	187646	690916	112.179326	3.08897	2	1.3	110.879326	3	G	1	6	2	Site Infrastructure	3	112.218361	1.127053	4	-0.039035	1	12	2	4
410	187646	690906	111.853441	2.223848	2	1	110.853441	2	G	1	4	1	Site Infrastructure	3	111.933237	5.490986	4	-0.079796	1	12	2	2
411	187656	690916	112.008571	3.438036	2	1.8	110.208571	3	R	1.5	9	2	Site Infrastructure	3	112.051862	1.127053	4	-0.043291	1	12	2	4
412	187656	690906	111.63344	2.223851	2	1.5	110.13344	3	G	1	6	2	Site Infrastructure	3	111.673238	1.127053	4	-0.039798	1	12	2	4
413	187661	690896	111.182409	2.099482	2	1.5	109.682409	3	G	1	6	2	Site Infrastructure	3	111.197237	5.22761	4	-0.014828	1	12	2	4
414	187666	690896	111.095409	2.086613	2	1.8	109.295409	3	G	1	6	2	Site Infrastructure	3	111.197237	2.75367	4	-0.101828	1	12	2	4
415	187666	690906	111.413439	2.20506	2	1.6	109.813439	3	G	1	6	2	Site Infrastructure	3	111.453237	1.127053	4	-0.039798	1	12	2	4
416	187678	690910	111.293959	2.731687	2	1.8	109.493959	3	G	1	6	2	Site Infrastructure	3	111.32716	0.911873	4	-0.033201	1	12	2	4
417	187760	690922	110.242068	2.766945	2	2.1	108.142068	3	G	1	6	2	Site Infrastructure	3	110.283308	0.854208	4	-0.04124	1	12	2	4
418	187756	690926	110.489467	2.729887	2	2	108.489467	3	G	1	6	2	Site Infrastructure	3	110.531561	1.127054	4	-0.042094	1	12	2	4
419	187756	690936	110.935193	2.531455	2	2.2	108.735193	3	C	2	12	2	Site Infrastructure	3	110.971535	1.127054	4	-0.036342	1	12	2	4
420	187756	690946	111.354512	2.223312	2	0.8	110.554512	2	R	1.5	6	2	Site Infrastructure	3	111.371878	1.127054	4	-0.017366	1	12	2	4
421	187766	690946	111.22358	2.730558	2	0.9	110.32358	2	C	2	8	2	Site Infrastructure	3	111.266437	1.127054	4	-0.042857	1	12	2	4
422	187766	690956	111.677863	2.584659	2	0.2	111.477863	1	R	1.5	3	1	Site Infrastructure	3	111.718036	1.127054	4	-0.040173	1	12	2	2
423	187756	690956	111.700959	2.060552	2	0.6	111.100959	2	C	2	8	2	Site Infrastructure	3	111.714827	1.127054	4	-0.013868	1	12	2	4
424	187766	690966	112.101109	2.277578	2	0.5	111.601109	1	C	2	4	1	Site Infrastructure	3	112.120829	1.127054	4	-0.01972	1	12	2	2
425	187776	690966	111.963577	2.7428	2	0.4	111.563577	1	C	2	4	1	Site Infrastructure	3	112.006435	1.127054	4	-0.042858	1	12	2	2
426	187766	690976	112.460422	2.073634	2	0.4	112.060422	1	C	2	4	1	Site Infrastructure	3	112.474278	1.127054	4	-0.013856	1	12	2	2
427	187776	690976	112.419467	2.622375	2	0.2	112.219467	1	C	2	4	1	Site Infrastructure	3	112.461561	1.127054	4	-0.042094	1	12	2	2
428	187786	690976	112.255894	3.142422	2	0.2	112.055894	1	R	1.5	3	1	Site Infrastructure	3	112.297238	1.127054	4	-0.041344	1	12	2	2
429	187786	690986	112.862114	2.859327	2	0.2	112.662114	1	R	1.5	3	1	Site Infrastructure	3	112.894882	1.127054	4	-0.032768	1	12	2	2
430	187776	690985	112.797643	2.356472	2	0.8	111.997643	2	R	1.5	6	2	Site Infrastructure	3	112.789706	0.765462	4	0.007937	1	12	2	4
431	187766	690986	112.800957	2.00379	2	0.8	112.000957	2	C	2	8	2	Site Infrastructure	3	112.814825	1.127054	4	-0.013868	1	12	2	4
432	187776	690996	113.178113	1.749513	1	1	112.178113	2	R	1.5	3	1	Site Infrastructure	3	113.191601	1.127054	4	-0.013488	1	12	2	2
433	187766	690996	113.13704	1.81632	1	0.8	112.33704	2	R	1.5	3	1	Site Infrastructure	3	113.150502	1.127054	4	-0.013462	1	12	2	2
434	187766	691006	113.445605	1.791179	1	1	112.445605	2	R	1.5	3	1	Site Infrastructure	3	113.460251	1.127054	4	-0.014646	1	12	2	2
435	187776	691006	113.485606	1.790313	1	0.3	113.185606	1	C	2	2	1	Site Infrastructure	3	113.500252	1.127054	4	-0.014646	1	12	2	2
436	187786	690996	113.218114	1.765705	1	0.5	112.718114	1	C	2	2	1	Site Infrastructure	3	113.231602	1.127054	4	-0.013488	1	12	2	2
437	187796	690996	113.253637	1.854136	1	0.5	112.753637	1	R	1.5	1.5	1	Site Infrastructure	3	113.269453	1.127054	4	-0.015816	1	12	2	2
438	187806	690996	113.27524	1.933927	1	0.6	112.67524	2	R	1.5	3	1	Site Infrastructure	3	113.292977	1.127054	4	-0.017737	1	12	2	2
439	187806	691006	113.605606	1.821699	1	0.2	113.405606	1	C	2	2	1	Site Infrastructure	3	113.620251	1.127054	4	-0.014645	1	12	2	2
440	187820	691016	113.94272	1.810486	1	0.4	113.54272	1	R	1.5	1.5	1	Site Infrastructure	3	113.9176	0.866078	4	0.02512	1	12	2	2
441	187806	691016	113.908112	1.776072	1	0.3	113.608112	1	C	2	2	1	Site Infrastructure	3	113.9216	1.127054	4	-0.013488	1	12	2	2
442	187797	691006	113.562029	1.793281	1	0.4	113.162029	1	R	1.5	1.5	1	Site Infrastructure	3	113.588252	1.020971	4	-0.026223	1	12	2	2
443	187786	691006	113.525607	1.790299	1	0.6	112.925607	2	C	2	4	1	Site Infrastructure	3	113.540253	1.127054	4	-0.014646	1	12	2	2
444	187786	691016	113.828114	1.77609	1	0.5	113.328114	1	C	2	2	1	Site Infrastructure	3	113.841602	1.127054	4	-0.013488	1	12	2	2
445	187776	691016	113.788114	1.776077	1	0.1	113.688114	1	G	1	1	1	Site Infrastructure	3	113.801602	1.127054	4	-0.013488	1	12	2	2
446	187766	691016	113.748113	1.776073	1	0.5	113.248113	1	R	1.5	1.5	1	Site Infrastructure	3	113.761601	1.127054	4	-0.013488	1	12	2	2
447	187916	691271	119.631404	4.931985	4	1.8	117.831404	3	R	1.5	18	3	Site Infrastructure	3	117.914025	35.278099	3	1.717379	1	9	1	3
448	187924	691286	120.973047	7.501051	4	0.6	120.373047	2	C	2	16	3	Site Infrastructure	3	117.914025	47.429355	3	3.059022	1	9	1	3
449	187916	691253	118.583288	3.197976	2	3	115.583288	3	G	1	6	2	Site Infrastructure	3	117.914025	21.041073	3	0.669263	1	9	1	2
450	187956	691240	118.091459	1.277894	1	2.4	115.691459	3	G	1	3	1	Site Infrastructure	3	117.835626	13.141228	3	0.255833	1	9	1	1
451	187963	691258	118.798399	4.550937	4	4.5	114.298399	8	C	2	64	5	Site Infrastructure	3	117.87175	31.423599	3	0.926649	1	9	1	5
452	187969	691272	120.195274	3.956652	2	2.2	117.995274	3	C	2	12	2	Site Infrastructure	3	117.87175	46.289043	3	2.323524	1	9	1	2
453	188015	691236	117.051002	3.460818	2	1	116.051002	2	G	1	4	1	Site Infrastructure	3	115.913034	43.046707	3	1.137968	1	9	1	1
454	188006	691226	116.774791	3.428749	2	0.8	115.974791	2	R	1.5	6	2	Site Infrastructure	3	116.098044	30.133818	3	0.676747	1	9	1	2
455	187994	691211	116.317023	3.204603	2	1.5	114.817023	3	G	1	6	2	Site Infrastructure	3	116.098044	10.537844	3	0.218979	1	9	1	2
456	188030	691174	115.15	1.371924	1	0.4	114.75	1	G	1	1	1	Site Infrastructure	3	115.197658	2.668249	4	-0.047658	1	12	2	2
457	188053	691188	114.93465	1.397643	1	0.3	114.63465	1	R	1.5	1.5	1	Site Infrastructure	3	115.197658	28.525514	3	-0.263008	1	9	1	1
458	188072	691193	114.571636	2.571982	2	0.2	114.371636	1	G	1	2	1	Minor Water Feature	6	114.944466	13.019731	3	-0.37283	1	18	2	2
459	188081	691125	111.982225	2.783312	2	0.1	111.882225	1	R	1.5	3	1	Minor Water Feature	6	111.962707	13.848971	3	0.019518	1	18	2	2
460	188060	691124	113.519619	5.231084	4	0.1	113.419619	1	G	1	4	1	Minor Water Feature	6	111.962707	30.329628	3	1.556912	1	18	2	2
461	188047	691124	114.492612	5.213212	4	0.1	114.392612	1	R	1.5	6	2	Minor Water Feature	6	112.154757	42.132735	3	2.337855	1	18	2	4
462	188057	691071	111.465671	6.807531	4	0.01	111.455671	1	G	1	4	1	Roads and Tracks	3	111.216097	2.692899	4	0.249574	1	12	2	2
463	187917	690940	109.25316	3.1499	2	0.1	109.15316	1	G	1	2	1	Roads and Tracks	3	107.59236	16.852359	3	1.6608	1	9	1	1
464	187883	690954	110.773518	3.319383	2	0.1	110.673518	1	R	1.5	3	1	Site Infrastructure	3	110.177958	42.52183	3	0.59556	1	9	1	1
465	187804	690901	108.410919	3.243919	2	0.9	107.510919	2	G	1	4	1	Site Infrastructure	3	107.667838	12.198318	3	0.743081	1	9	1	1
466	187977	691011	108.485667	8.338882	6	0.2	108.285667	1	R	1.5	9	2	Site Infrastructure	3	108.524449	0.250371	4	-0.038782	1	12	2	4
467	187985	691028	110.31409	6.791106	4	0.2	110.11409	1	R	1.5	6	2	Roads and Tracks	3	109.838846	5.555027	4	0.475244	1	12	2	4
468	187962	691042	113.639756	6.275057	4	0.3	113.339756	1	G	1	4	1	Site Infrastructure	3	113.792402	11.750703	3	-0.152646	1	9	1	1
469	187952	691032	113.976179	3.86955	2	0.7	113.276179	2	G	1	4	1	Site Infrastructure	3	114.014246	1.016009	4	-0.038067	1	12	2	2
470	187945	691016	113.668609	8.429916	6	0.01	113.658609	1	G	1	6	2	Site Infrastructure	3	113.921576	14.238902	3	-0.252967	1	9	1	2
471	187961	690996	109.269772	9.516994	6	0.2	109.069772	1	G	1	6	2	Roads and Tracks	3	108.474445	6.594065	4	0.795327	1	12	2	4
472	187912	690910	106.727662	5.440412	4	0.1	106.627662	1	G	1	4	1	Roads and Tracks	3	106.45517	7.16345	4	0.272492	1	12	2	2
473	187899	690895	106.393932	1.17959	1	0.1	106.293932	1	R	1.5	1.5	1	Site Infrastructure	3	106.383053	0.849113	4	0.010879	1	12	2	2
474	187880	690879	105.720049	2.657757	2	0.4	105.320049	1	G	1	2	1	Roads and Tracks	3	105.300494	12.485943	3	0.419555	1	9	1	1
475	187853	690890	106.697758	3.53698	2	0.9	105.797758	2	G	1	4	1	Site Infrastructure	3	107.218189	8.562829	4	-0.520431	1	12	2	2
476	187862	690905	107.378692	3.55071	2	0.5	106.878692	1	G	1	2	1	Site Infrastructure	3	107.384504	0.419284	4	-0.005812	1	12	2	2
477	187873	690926	108.862941	4.774315	4	0.4	108.462941	1	G	1	4	1	Site Infrastructure	3	107.430295	16.753691	3	1.432646	1	9	1	1
478	187833	690876	106.300885	3.639215	2	1.1	105.200885	3	R	1.5	9	2	Site Infrastructure	3	107.33584	16.354337	3	-1.034955	1	9	1	2
479	187830	690894	107.403003	3.640148	2	1.1	106.303003	3	G	1	6	2	Site Infrastructure	3	107.35216	0.904023	4	0.050843	1	12	2	4
480	187826	690906	108.184698	3.63324	2	1	107.184698	2	G	1	4	1	Site Infrastructure	3	107.520455	10.817271	3	0.664243	1	9	1	1
481	187780	690902	108.923113	3.105278	2	1.8	107.123113	3	R	1.5	9	2	Site Infrastructure	3	109.232936	14.757323	3	-0.309823	1	9	1	2
482	187812	690888	107.514181	3.615925	2	2.3	105.214181	3	G	1	6	2	Site Infrastructure	3	107.571766	0.924384	4	-0.057585	1	12	2	4
483	187816	690868	106.254123	2.896043	2	1.9	104.354123	3	G	1	6	2	Site Infrastructure	3	107.435841	18.954147	3	-1.181718	1	9	1	2

Slope Angles **Co-eff.**

0 2.0 1.0

2	4.0	2.0
4	8.0	4.0
8	15.0	6.0
15	35.0	8.0

Peat depths	
0	0.5
0.51	1.0
1.01	6.0

Substrate	
C	1.0
R	1.5
Peat proven	2.0
slip material	5.0

Receptor	Co-eff.
Roads and Tracks	1.0
Non-Major Water Feature	4.0
Dwelling	6.0
Major Water Feature	8.0
Non-Habitat	1.0
Important Habitat	8.0

Receptor Dist.	Co-eff.
0	10.0
10	100.0
150	1000.0
1000	2000.0

Receptor Elev.	Co-eff.
0	10.0
10	50.0
50	100.0
100	200.0

risk rating normalisation	
0	1.0
5	2.0
15	3.0
31	4.0
50	5.0
100.0	

impact rating normalisation	
0	1.0
10	2.0
20	3.0
30	4.0
50	5.0
100.0	

APPENDIX D – PEAT CORING RECORDS

Background

Peat cores were obtained from selected locations at the proposed Craig Murrail Substation and associated infrastructure in February 2022. Cores were advanced in areas of the Site where peat probing had identified the presence of deep peat to characterise the properties of the peatland in accordance with the *Peatland Survey. Guidance on Developments on Peatland (2017).* The document, which was published jointly by the Scottish Government, Scottish Natural Heritage (NatureScot) and SEPA, defines a consistent sampling methodology to quantify and qualify the peat material on site. It also provides advice on how to publish peat surveys as part of wider site investigations for development management applications, with a particular focus on wind farm developments.

The parameters used to determine the characteristics of the peat materials are outlined below.

i. Surface firmness estimation

An average man standing on one foot applies a pressure to the ground of between 5 and 6 lbs / p.s.i. and this fact is used to estimate the bearing capacity. The following symbols are used to denote the pressure the ground will stand.

Firmness of surface (P)

PO = Surface too soft to walk on

P1 = Surface just passable

P2 = Surface fairly firm

P3 = Surface firm

ii. Observations on the vegetation

The Site has been subject to commercial forestry at varying stages of development with a majority of the Proposed Development in a felled area where long grasses and shrubs now dominate.

iii. Observations on the peat

a. Botanical observations

Botanical observations of peat samples identified that Carex species are likely to make up a significant proportion of the organic material in the lower horizons where catotelmic peat is typically found.

b. Degree of humification - von POST SCALE

The degree of humification of peat samples is estimated in the field according to the method devised by the Swedish botanist L. von Post by squeezing a small amount of peat in the hand and the water and / or peat exuded indicates, by its colour and consistency, the degree to which the peat has undergone humification or, more correctly, a type of decomposition which includes breakdown under anaerobic conditions. The von Post scale ranges from 1 to 10, the higher the number the higher the degree of humification. The full scale is as follows:

Von Post Scale (H)	
H1	Completely undecomposed peat free of amorphous material. On squeezing, clear colourless water is pressed out.
H2	Nearly undecomposed peat, free of amorphous material, yielding only yellowish brown water on pressing.

H3	Very slightly decomposed peat, containing a little amorphous material. On squeezing, muddy brown water but no peat passes between the fingers. Residue is not pasty.
H4	Slightly decomposed peat containing some amorphous material. Strongly muddy brown water but no peat passes between the fingers. Residue is somewhat pasty.
H5	Moderately decomposed peat containing a fair amount of amorphous material. Plant structure recognisable though somewhat vague. On squeezing, some peat but mainly muddy water issues. Residue is strongly pasty.
H6	Moderately decomposed peat with a fair amount of amorphous material and indistinct plant structure. On pressing, about one third of the peat passes between the fingers. Residue is strongly pasty, but shows the plant structure more distinctly than in unsqueezed peat.
H7	Strongly decomposed peat with much amorphous material and faintly recognisable plant structure. On squeezing, about one half of the peat is extruded. The water is very dark in colour.
H8	Strongly decomposed peat with much amorphous material and very indistinct plant structure. On squeezing, two thirds of the peat and some water passes between the fingers. Residue consists of plant tissues capable of resisting decomposition (roots, fibres, wood, etc.).
H9	Practically fully decomposed peat with almost no recognisable plant structure. Nearly all the peat squeezed between the fingers as a uniform paste.
H10	Completely decomposed peat with no discernible plant structure. On squeezing, all the peat, without water, passes between the fingers.

iv. Fibre

The fibre content of each peat sample is estimated visually and the amounts of the two types (classified 'fine' or 'coarse') are noted on a scale ranging from 0 to 3 as shown below.

Fine fibres, mainly derived from *Eriophorum spp*. (F)

F0 = Nil
Fl = Low content
F2 = Moderate content
F3 = High content

Coarse fibres, mainly rootlets (R)

R0 = Nil
Rl = Low content
R2 = Moderate content
R3 = High content

v. Wood

Wood remains, especially if they are large and resistant, may conceivably cause a certain amount of difficulty during the exploitation of a bog. An attempt is therefore made when sampling to assess the extent of wood. It is estimated on a scale ranging from 0 to 3 as detailed below.

Wood remains (W)
W0= Nil
Wl = Low content
W2 = Moderate content

W3 = High content

vi. Other observations

When peat is freshly sampled and before it darkens by oxidation, note is taken of its colour, stratification, the presence of visible mineral matter and any other features of interest.

Photographs of the peat cores obtained from Craig Murrail along with information relating to the parameters outlined above are presented overleaf with a summary of the information gathered during the peat coring process presented in the main body of text of the Peat Landslide Hazard and Risk Assessment (PLHRA)

Core 1		
Core Samples	Detail	Surrounding Environment
		

Location	Depth (m)	Firmness of Surface (P)	Von Post (H)	Fine Fibres (F)	Coarse Fibres (R)	Wood Remains (W)	Other Observations (Colour)
E 187888, N 691161	0.0-0.5	2	5	2	2	2	Light Brown
	0.5-1.0		5	3	2	2	Light Brown
	1.0-1.5		6	2	2	2	Brown
	1.5-2.0		7	1	1	1	Dark Brown
	2.0-2.5		7	1	0	1	Dark Brown

Core 2		
Core Samples	Detail	Surrounding Environment
		

Location	Depth (m)	Firmness of Surface (P)	Von Post (H)	Fine Fibres (F)	Coarse Fibres (R)	Wood Remains (W)	Other Observations (Colour)
E 187716, N 691083	0.0-0.5	2	3	1	2	3	Light Brown
	0.5-1.0		4	2	3	2	Light Brown
	1.0-1.5		6	1	2	2	Brown
	1.5-1.8		8	1	1	1	Dark Brown

Core 3		
Core Samples	Detail	Surrounding Environment
		

Location	Depth (m)	Firmness of Surface (P)	Von Post (H)	Fine Fibres (F)	Coarse Fibres (R)	Wood Remains (W)	Other Observations (Colour)
E 187726, N 690889	0.0-0.5	3	6	1	2	2	Dark Brown
	0.5-1.0		5	2	2	2	Brown
	1.0-1.5		6	2	2	2	Brown
	1.5-2.0		7	2	1	1	Dark Brown
	2.0-2.5		7	2	1	2	Dark Brown
	2.5-3.0		9	0	1	1	Black Brown