Technical Appendix 8.7: Peat Landslide Hazard Risk Assessment

Technical Appendix 8.7: Peat Landslide and Hazard Risk Assessment

1.1 Introduction

1.1.1 The objectives of the PLHRA are to:

- Undertake a desk-based review of published information including geological, hydrogeological and topographical information, to inform the baseline for the PLHRA;
- Undertake site visits to identify evidence of, and potential for, active, incipient or relict peat instability, including identification of the location of features as required;
- Reporting on evidence of any active, incipient or relict peat instability, and the potential risk of future instability, describing the likely causes and contributory factors;
- Identify potential controls to be imposed during the construction phase to minimise the risk of any peat instability at the Site; and
- Identify requirements for further work or specific construction methodologies to suit the ground conditions to mitigate against any increased risk of potential peat instability.

1.1.2 The scope of the PLHRA is as follows:

- Characterise the peatland geomorphology to determine whether there have been prior occurrences of instability, and whether contributory factors that might lead to instability in future are present across the Site;
- Determine the likelihood of a future peat landslide under natural conditions and in association with construction activities associated with the Proposed Development;
- Identify potential receptors that might be affected by peat landslides, should they occur, and quantify the associated risks; and
- Provide appropriate mitigation and control measures to reduce the risks to acceptable levels such that the Proposed Development is constructed safely with minimal risks to the environment.

1.1.3 The contents of this PLHRA have been prepared in accordance with the Scottish Government's Best Practice Guidance[1], noting that the guidance '*should not be taken as prescriptive or used as a substitute for the developer's [consultant's] preferred methodology*'.

1.2 Methodology

1.2.1 A desk study and several field surveys were undertaken to gather baseline conditions of the Site and allow a PLHRA to be completed. The desk study included an overview of the following elements to inform the baseline design:

- Bedrock and superficial geology from BGS Mapping[2];
- Peatland and peat characteristic information from the Scottish Natural Heritage (NatureScot) carbon rich soils, deep peat and priority habitat[3];
- Hydrogeological and Hydrology information from **Chapter 8: Hydrology, Hydrogeology and Geology (EIAR);**
- Topographical information taken from published Digital Terrain Model (DTM) LIDAR data;
- Media articles, historic maps and local landowner accounts of historic land movements; and
- Meteorological rainfall data[4].

1.2.2 The results of the desk study are discussed **Section 1.3** of this report.

Field Survey

1.2.3 Peat surveys were undertaken at the Site to understand the baseline peat conditions and potential constraints, and to inform the design of the Proposed Development to minimise, as far as practicable, the potential direct and indirect effects on peat and carbon rich soils.

1.2.4 The following surveys were undertaken:

- Stage 1 peat probing undertaken by Ramboll in December 2024 and by Fluid Environmental Consulting Limited in January 2025; and
- Stage 2 peat probing and coring undertaken by Fluid Environmental Consulting in November 2025 and February 2026.

1.2.5 Historical publicly available peat probing data[5] from a survey conducted in 2018 that covered a wider area outside of the Site was also used.

1.2.6 Peat probing and coring followed relevant guidance on peatland surveys[6,7]. The methods employed for peat depth probing and peat coring are detailed further below.

Stage 1 Peat Probing

1.2.7 The Stage 1 survey is a preliminary, low density survey and was carried out on a 100 m grid across the Site within areas of likely peatland. The probing was carried out using collapsible avalanche probes, allowing for probing in excess of 6 m. This peat depth data along with other environmental and engineering constraints were used to inform the layout of the Proposed Development.

1.2.8 The survey points and field data were collected using a handheld Trimble GPS unit. Peat depth data was modelled using Inversive Distance Weighted (IDW) interpolation in GIS software, and a depth model generated using incremented peat depth categories.

Stage 2 Peat Probing and Coring

1.2.9 The high-density probing during the Stage 2 survey was carried out along the access tracks, and at the planned turbine, crane pad, and other infrastructure locations, known at the time of the survey. The sampling pattern comprised:

- Proposed turbine locations: peat probing was undertaken at 10 m intervals along cardinal points from the central point of the infrastructure to a distance of 50 m; and
- Proposed new tracks: the alignment was probed at 50 m intervals along the track and at points every 10 m perpendicular to the centreline on either side of the proposed track.

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[1] Scottish Government (2017). Peat Landslide Hazard and Risk Assessments, Best Practice Guide for Proposed Electricity.

[2] Available at: GeoIndex (onshore) - British Geological Survey

[3] Available at: https://opendata.nature.scot/maps/171df29c8c5b45a9b93438a3bc5700c6

[4] Met Office Weather Data Dumfries: https://www.metoffice.gov.uk/research/climate/maps-and-data/location-specific-long-term-averages/gcv3nm521

[5] Data was taken from the Harryburn wind farm consent application, which was submitted in 2018. Available online: https://www.energyconsents.scot/ApplicationDetails.aspx?cr=EC00005277, access 26.03.2026

[6] Scottish Government, Scottish Natural Heritage, SEPA. (2017). Peatland Survey. Guidance on Developments on Peatland. Available at: https://www.gov.scot/publications/peatland-survey-guidance/

[7] Scottish Renewables and SEPA (2012). Development on Peatlands. Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste.

1.2.10 Again, this was carried out using collapsible avalanche probes, allowing for probing in excess of 6 m, and data collected using a handheld Trimble GPS unit.

1.2.11 Peat cores were taken using a Russian auger, with a sample volume of 0.5 litre (l), and a number of field tests and observations were undertaken. During this survey, peat cores were taken and a number of field tests and observations were undertaken to identify:

- Depth of acrotelm;
- Degree of humification using the Von Post classification;
- Fine fibre content, based on scale of F0 (none) to F3 (very high);
- Coarse fibre content, based on scale of R0 (none) to R3 (very high);
- Water content, based on scale of B1 (dry) to B5 (very wet); and
- Substrate underlying the peat where this was possible.

1.2.12 A peat depth probe was taken adjacent to the core location, and cores were photographed.

1.2.13 Peat coring locations were selected based on where key infrastructure was proposed and to achieve a spread of peat core locations across the Site in order to provide useful information on the condition of the peat that would potentially be affected by the Proposed Development.

1.2.14 During the Stage 2 peat probing and coring survey, observations were made on aspects of the peatland such as its condition and the presence of drainage features.

Limitations and Assumptions

1.2.15 Surveying has been undertaken based on the Proposed Development design and associated infrastructure locations available at the time of the survey to inform the assessment of the layout submitted for consent. The data collected to inform this PLHRA is considered sufficient to support a robust assessment of the peat landslide hazards and risks. Should the infrastructure design change outside the incorporated limits of deviation, then further surveying and subsequent amendments to the PLHRA reporting may have to be undertaken.

1.3 Desk Study and Site Information

1.3.1 The Site location and setting are described in **Chapter 2: Description of Proposed Development (EIAR Volume 2).**

Topography

1.3.2 The Site topography is generally undulating, a moderately steep landscape is sculpted around five main hill peaks (Ravengill Dod, Coom Dod, Gled Knoll, Wellgrain Dod and Hunt Law). Ground elevation varies significantly from 240 metres Above Ordnance Datum (mAOD) at the north-east of the Site to 555 m AOD at the summit of Wellgrain Dod; located towards the centre of the Site. Ravengill Dod, where Turbine 9 is located, summit is at 538 m AOD. Coom Dod summit is at 553 m AOD. Gled Knoll, where Turbine 20 is located, summit is at 530 m AOD. Hunts Law summit is at 523 m AOD.

1.3.3 Topography and elevation are shown on **Figure 8.7.1 – Elevation.**

1.3.4 Slope angles at the Site, as shown on **Figure 8.7.2 – Slope Angle**.

Geology

Solid Geology

1.3.5 The underlying bedrock across the Site comprises Portpatrick Formation (Wacke) to the north of Leadhills, Kirkcolm Formation (Wacke) in the northwest portion, and Shinnel Formation (Wacke) in the southeast portion of the Site. There are small areas of Crawford Group (Chert) which is faulted, shown crossing the Site in a northeast to south westerly direction, and this comprises lava, chert, tuff and mudstone succession. This is shown in **Figure 8.7.3.1.**

1.3.6 The 1:50,000 scale geological mapping available from the British Geological Survey (BGS)[2] shows most of the Site is underlain by the following formations:

- Kirkcolm Formation- Wacke (KKF);
- Portpatrick Formation and Glenwhargen Formation (Undifferentiated) - Wacke (PPGW);
- Crawford Group and Moffat Shale Group (Undifferentiated) - Mudstone, Chert and Smectite-Claystone (CRMF); and
- Stewartry Group - Sandstone, Breccia and Conglomerate (STEW).

1.3.7 To the east/south-east of the Site, Turbines 10, 11, 12, 14, 15 16, 17, 18, 19, 20 and 21 are underlain by solid geology of the Portpatrick and Glenwhargen Formation (Undifferentiated) - Wacke (PPGW). The BGS Lexicon[8] describes the formation as Wacke and Siltstone turbidite succession.

1.3.8 To the west of the Site, Turbines 1, 2, 3, 4, 5, 6, 7, 8, 9 and 13 are underlain by solid geology of Kirkcolm Formation - Wacke (KKF, described in the BGS Lexicon as a Sandstone/Siltstone turbidite sequence.

1.3.9 The Leadhills fault runs across the Site between the KKF and the PPGW in a north-east to south-west direction.

1.3.10 An Igneous Intrusion named as Theoletic quartz-bearing dolerite crosses through the centre of the Site in a north-west to south-east direction – underlying Turbines 1 and 21.

1.3.11 Site compound 1, the Substation and BESS are underlain by solid geology of Crawford Group and Moffat Shale Group (Undifferentiated) - Mudstone, Chert and Smectite-Claystone (CRMF). Described as Lava, chert, tuff and mudstone succession in the BGS Lexicon.

1.3.12 In order of newest to oldest formation, BGS 1:50 000 Geology Series Map Scotland Sheet 15 Solid Geology shows the geological sequence underlying the site to be; Stew, PPGW, KKF then CRMF.

1.3.13 BGS mapping[2] shows three fault lines, running approximately parallel in a southwest to northeast direction. A reverse/thrust fault borders the western edge of the Site (hanging wall towards west), a fault of unknown displacement is mapped towards Watchman's Brae, and a reverse/thrust fault is mapped bordering the Site to the east (hanging wall east). Each fault represents a boundary between the rock formations discussed above. The fault of unknown displacement is intercepted by the granite intrusion, but mapping shows the fault to continue further south of the intrusion.

1.3.14 The Scotland's Environment Map online viewer shows a Geological Conservation Review Site and Site of Special Scientific Interest (SSSI) located in the northeast portion of the Site known as Raven Gill, which has been designated for its geological importance and covers an area of 6.66 ha. The designated area includes rocks and exposures of Arenig – Llanvirn age, representing the British geological record of Earth history from about 483 to 460 million years ago (Ma)131. No aspect of the Proposed Development would encroach within this area.

[8] British Geological Survey, BGS Lexicon of Named Rock Units. [Accessed 01/10/2025] Available: SEARCH Rock Name Database | Lexicon of Named Rock Units | British Geological Survey (BGS)

Mining

1.3.15 A review of aerial imagery and online historical maps indicate that areas of the Site have been used for lead mining.

1.3.16 The Mining Remediation Authority Map Viewer indicates that there are Abandoned Mines Catalogue sites present, covering both surface and deep mining operations, which depict areas of coal and other mineral extraction and the point of entry into these workings located within or in proximity to the Site. Leadhills is identified as having several abandoned mines located around the village.

1.3.17 A mining risk assessment (**Technical Appendix 8.8, EIAR Volume 4**) has been undertaken, which identified that historically the Leadhills Estate was subject to lead (and more historically gold) mining activity with evidence of disused mines and mining assets extensive on parts of the Estate. Abandoned mines and their associated mining assets may represent potential sources of ground instability and soil and water contamination.

1.3.18 The main area of recorded mining activity in the locality is around the villages of Leadhills and Wanlockhead. The mines around these villages were rich in lead with extensive underground workings and were operated virtually continuously from the 17th Century to 1934. There were, however, mining activities undertaken in the surrounding hills from earlier periods. The earlier workings predate the legal requirement for the deposition of mine plans on the abandonment of a mine and, as such, records of mining activities are often lacking. The presence of mining activities on and adjacent to the Site appears to be limited to the slate quarry at Glenochar and small-scale quarrying shown on the eastern slopes of Watchman Hill.

Superficial Geology

1.3.19 BGS mapping[2] shows the superficial geology underlying the Site predominantly comprises Devensian Till (Diamicton) and peat deposits. Small areas of Alluvium, comprising clay, silt, sand and gravel, are present in proximity to the burns and watercourses at the Site. There are also small areas of hummocky (moundy) glacial deposits (Diamicton). Large areas of the Site have no superficial deposits mapped. Superficial Geology is shown on **Figure 8.7.3.2**

1.3.20 A review of the SNH Carbon and Peatland Map (2016)[9] confirms the Site is predominantly overlain by 'Class 0' and 'Class 4' soils, which are defined as 'mineral soils' or 'mineral soils with some peat present' and do not typically support peatland habitats.

1.3.21 Large areas of 'Class 3' soils are found across the Site, which typically are carbon-rich soils, with some areas of deep peat. Multiple discreet areas of 'Class 1' peatland are also identified across the Site. Class 1 soils are defined as nationally important carbon-rich peatland soils, deep peat and priority peatland habitat and likely to be of high conservation value. Smaller areas of 'Class 5' are also shown, defined as areas of peat soil where soil information takes precedence over vegetation data. No peatland habitat was previously recorded in these areas, which may also include areas of bare soil.

Hydrogeology and Hydrology

1.3.22 The BGS 1:625,000 scale hydrogeology mapping[10] defines the rocks as follow:

- *Kirkcolm Formation- Wacke (Kkf) = low productivity aquifer (Highly indurated greywackes with limited groundwater in near surface weathered zone and secondary fractures).*
- *Portpatrick Formation and Glenwhargen Formation (Undifferentiated) - Wacke (Ppgw) = low productivity aquifer (Highly indurated greywackes with limited groundwater in near surface weathered zone and secondary fractures).*
- *Crawford Group and Moffat Shale Group (Undifferentiated) - Mudstone, Chert and Smectite-Claystone (Crmf) = low productivity aquifer (Very limited groundwater from fractures. Very limited outcrop areas).*
- *Stewartry Group - Sandstone, Breccia and Conglomerate (Stew) = highly productivity aquifer (Regionally important aquifer up to 1500 m thick with sandstones and breccias yielding up to 40 L/s).*

1.3.23 The average annual rainfall for the nearest weather station (Met Office weather station at Camps Resr[4]) is 1353.45 mm, based on the most recent dataset (1991 to 2020).

Surface Water Features

1.3.24 The entirety of the Site, including access tracks and proposed turbine locations is shown to be within the River Clyde catchment (SEPA Catchment No. 97). Larger tributaries of the River Clyde, that are located within the Site boundary are included below:

- Glengonnar Water (Flows south to north adjacent to the B797, crossed by the proposed western access track);
- Laggen Gill (Crossed by proposed northern access track at downstream extents);
- Kirk Gill (Crossed by proposed northern access track at downstream extents);
- Glencaple Burn (Crossed by proposed central access track at its upstream extent, and crossed by the proposed northern access track at its downstream extent);
- Glenkip Burn (Crossed by proposed western access track);
- Glendorch Burn (Crossed by proposed western access track);
- Elvan Water (Immediately south of the southern Site boundary); and
- Shortcleuch Water (Immediately south of the southern Site boundary)

1.3.25 Multiple unnamed watercourses are present on the Site, including a number of watercourses which are crossed by existing infrastructure in the form of circular culverts.

1.3.26 Surface water flood risk associated with the aforementioned watercourses, appears to be confined to the main channel and immediate surrounding area. Small areas of Low risk of flooding are expected to impact the northern access track, with the area of highest risk of associated with land in the north where the proposed access track crosses Laggen Gill and Glengonar Water.

1.3.27 SEPA mapping identifies some limited areas of elevated surface water flood risk on the Site. Generally, the Site is at a very low risk of surface water flooding (less than a 1 in 1,000 (0.1%) annual probability).

Groundwater Dependent Terrestrial Ecosystems (GWDTE)

1.3.28 NVC habitat surveying carried out by SLR has confirmed that areas of the Site are classified as potentially Groundwater Dependent Terrestrial Ecosystems (GWDTE) as detailed in **Chapter 6: Ecology (EIAR Volume 2)**. Therefore, further hydrological assessment has been carried out by Ramboll to determine the actual likelihood of groundwater dependency and the sensitivity of such habitats. Hydrological assessment of potential impacts of the Proposed Development on GWDTE is

[9] Scottish Natural Heritage. (2016). Carbon and Peatland 2016 Map (http://map.environment.gov.scot/soil_maps/)

[10] British Geological Survey, 1:625,000 scale digital hydrogeological data. [Accessed 01/10/2025] Available: http://www.bgs.ac.uk/products/hydrogeology/maps.html

provided in **Technical Appendix 8.2: Groundwater Dependent Terrestrial Ecosystem (GWDTE) Assessment (EIAR Volume 4).**

Private Water Supplies

1.3.29 The following information should be read in Conjunction with **Chapter 8 Hydrology, Hydrogeology, Geology and Soils (EIAR).**

1.3.30 Mapping indicates that this area, is closely located to an identified Private Water Supply (PWS) that is located within 250 m of the proposed northern access track.

1.3.31 PWS registers held by South Lanarkshire Council (SLC) indicate that a total of fifteen (15) PWS end users are recorded within a 2 km radius of the Site boundary, of which four (4) are located on site, and the buffer of five (5) PWS' intersect the site boundary.

1.3.32 A PWS risk assessment is included in **Technical Appendix 8.4 (EIAR Volume 4)**.

Land use

1.3.33 The 'Site' covers an area of approximately 2,554.5 hectares (ha) and is located north of Leadhills village, south of Abington village and west of the A74(M) motorway. The Site predominantly comprises open moorland, improved grassland and semi-improved grassland, with areas of forestry located in the valleys, predominantly to the east of the B797.

1.3.34 Multiple unnamed watercourses are present on the Site, including a number of watercourses which are crossed by existing infrastructure in the form of circular culverts.

1.3.35 The Site is relatively hilly, with a maximum peak of 555 m AOD.

1.3.36 Quarries and abandoned mine shafts are present within the Site boundary, particularly to the west and south-west.

Geomorphology

1.3.37 Digital aerial photography and Digital Terrain Model (DTM) LIDAR data was used to interpret and map geomorphological features within the developable areas of the Site. This interpretation and the resulting geomorphological map, as shown in **Figure 8.7.4** were subsequently verified during Site walkovers.

1.3.38 The geomorphological features recorded are shown on **Figure 8.7.4**. The presence, characteristics and distribution of peatland geomorphological features have been defined to understand the hydrological function of the peatland, with reference to the balance of erosion and peat accumulation (or condition), and the sensitivity of peatland to potential land-use changes.

1.3.39 Several localised areas of peat flushes were recorded across the Site which displayed basal erosion of peat due to surface water run-off. No major instability features, evidence of incipient instability or past landslides were noted.

1.4 Field Survey

1.4.1 Results from the peat surveys are detailed within **Technical Appendix 8.4 (EIAR Volume 4)**.

Peat Depth and Character

1.4.2 The peat depth survey results indicate that the footprint of the Proposed Development is predominately underlain by areas where either no peat is present or a shallow depth of peat is present, which can be considered as organo-mineral soil (approximately 83% of the Stage 2 peat depth probes recorded peat depths less than or equal to 0.5 m depth). Further, approximately 97% of the Stage 2 peat depth probes recorded peat depths less than or equal to 1 m in depth.

1.4.3 The Stage 2 peat depth survey results represented in Graph 1 are described as follows:

- 697 no. samples (8.6%) located on land with no peat present (≤ 0.05 m depth of peat);
- 6044 no. samples (74.5%) located on land with > 0.05 m and ≤ 0.5 m depth of peat or organo-mineral soil;
- 1118 no. samples (13.8%) located on land with > 0.5 m and ≤ 1.0 m depth of peat;
- 184 no. samples (2.3%) located on land with > 1.0 m and ≤ 1.5 m depth of peat;
- 45 no. samples (0.6%) located on land with > 1.5 m and ≤ 2.0 m depth of peat; and
- 30 no. samples (0.4%) located on land with > 2.0 m and ≤ 4.0 m depth of peat.

1.4.4 The maximum peat depth recorded during the Stage 2 surveys was 3.7 m and the average (mean) was 0.36 m.

1.4.5 The peat depth results are shown in **Figure 8.7.5**. Please refer to **Technical Appendix 8.5** (**EIAR Volume 4**) for further information of peat survey results.

1.4.6 Overall, the peat sampled across the Site was relatively shallow. Peat was found to be generally dry and in a state of moderate decomposition.

1.4.7 The majority of the Site has either no peat present or has a shallow depth of peat present (approximately 83% of peat probes were ≤0.5 m in depth). These areas of shallow peat can be considered as organo-mineral soils or peaty soils as described in ECUBPG[1] and therefore not considered in this assessment for the following reasons:

- Peaty soils in isolation do not pose a significant threat to watercourse and habitat environments.
- In isolation, their soil properties differ to that of peat, and due to their limited depth, a potential slide would be minor and limited in volume.

1.4.8 However, peaty soils are considered where they occur within areas of adjacent peat instability as their presence may contribute to the peat slide likelihood.

1.5 Peat Instability

Types of Peat Instability

1.5.1 Peat instability can be defined as either 'minor instability' or 'major instability' and observed by both field observations and through desk top review of aerial/satellite imagery of the Site:

- Minor instability can be defined as localised and small scale features that are not generally precursors to major failure and including gully sidewall collapses, pipe ceiling collapses, minor slumping along diffuse drainage pathways (e.g. along flushes). Indicators of minor instability include presence of tension cracks, compression ridges, or bulges; and
- Major instability can be defined by peat landslides.

1.5.2 For the purposes of this assessment, landslide classification is simplified and split into three main types:

- multiple peat slides with displaced slabs and exposed substrate;
- bog burst with peat retained within the failed area; and
- multiple peat soil slides with displacement of thin soils exposing substrate.

1.5.3 The term 'peat slide' is used to refer to large-scale landslides and occur 'top-down' from the point of initiation on a slope in thinner peats (between 0.5 and 1.5 m) and on moderate slope angles (typically 5-15°).

1.5.4 The term 'bog burst' is used to refer to very large-scale failures where peat is typically deeper (greater than 1.0 m and up to 10 m) and more amorphous than sites experiencing peat slides, with shallower slope angles (typically 2-5°).

1.5.5 'Peaty soil slide' is used to refer to small-scale slab-like slides in organic soils generally <0.5 m thick.

Factors Contributing to Peat Instability

1.5.6 Peat landslides are caused by a combination of preconditioning factors and triggering factors. The combined factors are discussed in greater detail in the Landslide Susceptibility Approach section of this report. Triggering factors have an immediate or rapid effect on the stability of a peat accumulation whereas preconditioning factors can influence peat stability over a much longer period. Only some of these factors can be addressed by site characterisation.

1.5.7 Preconditioning factors may influence peat stability over long periods of time (years to hundreds of years), and include:

- impeded drainage caused by a peat layer overlying an impervious clay or mineral base (hydrological discontinuity);
- a convex slope or a slope with a break of slope at its head (concentration of subsurface flow);
- proximity to local drainage, either from flushes, pipes or streams (supply of water);
- connectivity between surface drainage and the peat/impervious interface (mechanism for generation of excess pore pressures);
- artificially cut transverse drainage ditches, or grips (elevating pore water pressures in the basal peat mineral matrix between cuts, and causing fragmentation of the peat mass);
- increase in mass of the peat slope through peat formation, increases in water content or afforestation;
- reduction in shear strength of peat or substrate from changes in physical structure caused by progressive creep and vertical fracturing (tension cracking or desiccation cracking), chemical or physical weathering or clay dispersal in the substrate;
- loss of surface vegetation and associated tensile strength (e.g. by burning or pollution induced vegetation change);
- increase in buoyancy of the peat slope through formation of sub-surface pools or water-filled pipe networks or wetting up of desiccated areas; and
- afforestation of peat areas, reducing water held in the peat body, and increasing potential for formation of desiccation cracks which are exploited by rainfall on forest harvesting.

1.5.8 Triggering factors are typically of short duration (minutes to hours) and any individual trigger event can be considered as a result of cumulative events:

- intense rainfall or snowmelt causing high pore pressures along pre-existing or potential rupture surfaces (e.g. between the peat and substrate);
- rapid ground accelerations (e.g. from earthquakes or blasting); unloading of the peat mass by fluvial incision or by artificial excavations (e.g. cutting);
- focusing of drainage in a susceptible part of a slope by alterations to natural drainage patterns (e.g.by pipe blocking or drainage diversion); and
- loading by plant, spoil or infrastructure.

1.5.9 External environmental triggers such as rainfall and snowmelt cannot be mitigated, though they can be managed (e.g. by limiting construction activities during periods of intense rain).

1.5.10 Unloading of the peat mass by excavation, loading of the peat by plant and focusing of drainage can be managed and mitigated by careful design, site specific stability analyses, informed working practices and monitoring.

Approaches to Assessing Peat Instability

1.5.11 This report considers a qualitative contributory factor-based approach and conventional stability analysis (through limit equilibrium or Factor of Safety (FoS) analysis).

1.5.12 The advantage of the former is that many observed relationships between reported peat landslides and ground conditions can be considered together where a FoS is limited to consideration of a limited number of geotechnical parameters. The disadvantage is that the outputs of such an approach are better at illustrating relative variability in landslide susceptibility across a site rather than absolute likelihood.

1.5.13 The advantage of the FoS approach is that clear thresholds between stability and instability can be defined and modelled numerically. However, in reality, there is considerable uncertainty in input parameters and it is a generally held view that the geomechanical basis for stability analysis in peat is limited given the nature of peat as organic material, rather than mineral soil.

1.5.14 To reflect these limitations, both approaches are adopted and outputs from each approach integrated in the assessment of landslide likelihood.

Assessment of Peat Landslide Likelihood

Introduction

1.5.15 This section provides details on the landslide susceptibility and limit equilibrium approaches to the assessment of peat landslide likelihood used in this report. The assessment of likelihood is a key step in the calculation of risk, where risk is expressed as follows:

Risk = Probability of a Peat Landslide x Adverse Consequences

1.5.16 The probability of a peat landslide is expressed in this Technical Appendix as peat landslide likelihood and is considered below.

Limit Equilibrium Approach

1.5.17 Stability analysis has been undertaken using the infinite slope model to determine the FoS for a series of 25 m x 25 m cells within the developable area. The limit equilibrium approach has been applied within areas where the peat thickness is over 0.5 m. The limit equilibrium approach is the most frequently cited approach for the quantitative assessment of the stability of peat slopes. The approach assumes that failure occurs by shallow translational land sliding, which is the mechanism usually interpreted for peat slides. Due to the relative length of the slope and depth to the failure surface, end effects are considered negligible and the safety of the slope against sliding may be determined from analysis of a 'slice' of the material within the slope.

1.5.18 The stability of a peat slope is assessed by calculating a Factor of Safety, F, which is the ratio of the sum of resisting forces (shear strength) and the sum of driving forces (shear stress):

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

In this formula:

- c is the effective cohesion (kPa);
- γ is the bulk unit weight of saturated peat (kN/m3);
- γw is the unit weight of water (kN/m³);
- z is the vertical peat depth (m),

- h is the height of the water table as a proportion of the peat depth;
- β is the angle of the substrate interface (°); and
- ϕ' is the angle of internal friction of the peat (°).

1.5.19 This form of the infinite slope equation uses effective stress parameters, and assumes that there are no excess pore pressures, i.e. that the soil is in its natural, unloaded condition.

1.5.20 The choice of water table height reflects the full saturation of the soils that would be expected under the most likely trigger conditions, i.e. heavy rain.

1.5.21 Where the driving forces exceed the shear strength (i.e. where the bottom half of the equation is larger than the top), F is <1, indicating instability. A FoS between 1 and 1.4 is normally taken in engineering terms to indicate marginal stability (providing an allowance for variability in soil strength, depth to failure). Slopes with a FoS greater than 1.4 are generally considered to be stable.

1.5.22 There are numerous uncertainties involved in applying geotechnical approaches to peat, not least because of its high water content, compressibility and organic composition. Peat comprises organic matter in various states of decomposition with both pore water and water within plant constituents, and the frictional particle-to-particle contacts that are modelled in standard geotechnical approaches are different in peats. There is also a tensile strength component to peat which is assumed to be dominant in the acrotelm, declining with increasing decomposition and depth. As a result, analysis utilising geotechnical approaches is often primarily of value in showing relative stability across a site given credible and representative input parameters rather than in providing an absolute estimate of stability. With this in mind, representative data inputs have been derived from published literature and used for drained analysis only.

Data Inputs

1.5.23 Stability analysis was undertaken using GIS software and a 25 m x 25 m grid was superimposed on areas of peat only, with key input parameters derived for each grid cell. A 25 m x 25 m cell size was chosen because it is sufficiently small to define a minimum credible landslide size and avoid 'smoothing' of important topographic irregularities. Given the cell size of the input DTM, which provides a key input parameter, any smaller cell size would be unlikely to provide significant benefits.

1.5.24 **Table 8.7.1** shows the input parameters and assumptions for the stability analyses undertaken. The shear strength parameters c' and ϕ' are usually derived in the laboratory using undisturbed samples of peat collected in the field and therefore site-specific values are often not available ahead of detailed site investigation for a development. Therefore, for this assessment, a literature search has been undertaken to identify a range of credible but conservative values for c' and ϕ' quoted in fibrous and humified peats. FoS analysis was undertaken with a conservative **ϕ' of 22 °** and a value of **5 kPa for c'**.

Table 8.7.1: Geotechnical Parameters for Drained Infinite Slope Analysis

Parameter	Values	Rationale	Source
Effective Cohesion (c')	5	Credible conservative cohesion values for humified peat based on literature review	5.5 - 6.1 - peat type not stated (Long, 2005)[11] 3, 4 - peat type not stated (Long, 2005)[11] 5 - basal peat (Warburton et al., 2003)[12] 8.74 - fibrous peat (Carling, 1986)[13] 4 - peat type not stated (Dykes and Kirk, 2001)[14] 7 – 12 - H8 peat (Huat et al, 2014)[15]
Bulk Unit Weight (γ)	10.5	Mid-range value for humified catotelmic peat taken from Laboratory testing	10.1 – catotelm peat (Mills, 2002)[16] 10.1 – Irish bog peat (Boylan et al, 2008)[17]
Effective Angle of Internal Friction (ϕ')	22	Credible conservative friction angle for humified peat based on literature review	40 – 65 - fibrous (Huat et al, 2014)[15] 50 – 60 - amorphous (Huat et al, 2014)[15] 36.6 - 43.5 - peat type not stated (Long, 2005)[11] 31 – 55 - Irish bog peat (Hebib, 2001)[18] 34 – 48 - fibrous sedge pear (Farrell & Hebib, 1998)[19] 32 – 58 - peat type not stated (Long, 2005)[11] 23 - basal peat (Warburton et al, 2003)[12] 21 - fibrous peat (Carling, 1986)[13]
Slope Angle from Horizontal (β)	Various	Mean slope angle per 25 m x 25 m grid cell	5 m DTM of site
Peat Depth (z)	Various	Mean peat depth per 25 m x 25 m grid cell	Interpolated peat depth model of site
Height of Water Table as a Proportion of Peat Depth (h)	1	Assumes peat mass is fully saturated (normal conditions during intense rainfall events or snowmelt, which are the most likely natural hydrological conditions at failure)	Assumed

Results

1.5.25 **Figure 8.7.6** shows the results for drained analysis of the peat areas at the Site. The results indicate that the Factors of Safety demonstrates stability across the proposed development (FoS >1.4). This is consistent with the lack of observation of instability features during the Site walkover and on review of aerial imagery.

1.5.26 Infrastructure and Access Track locations are presented in **Figure 8.7.10.**

1.5.27 The following areas of Unstable ground (FoS = <1.0) are mapped:

- 110m west of Access Track 5 at Chainage 6050m;
- 200m east of Access Track 5 at Chainage 4500m;
- 200m south of Turbine 17;

1.5.28 The following areas of Marginal Unstable ground (FoS = 1.0 – 1.4) are mapped:

- 220m east of the Access Track 4 at chainage 2600m;

[11] Long M (2005) Review of peat strength, peat characterisation and constitutive modelling of peat with reference to landslides.
[12] Warburton et al (2003) Anatomy of a Pennine peat slide, Northern England. Earth Surface Processes and Landforms.
[13] Carling (1986) Peat slides in Teesdale and Weardale, Northern Pennines, July 1983: description and failure mechanisms.
[14] Dykes and Kirk (2001) Initiation of a multiple peat slide on Cuilcagh Mountain, Northern Ireland.
[15] Huat et al (2014) Geotechnics of organic soils and peat.
[16] Mills (2002) Peat slides: Morphology, Mechanisms and Recovery
[17] Boylan N, et al (2008) Peat slope failure in Ireland
[18] Hebib (2001) Experimental investigation of the stabilisation of Irish peat
[19] Farrell and Hebib (1998) The determination of the geotechnical parameters of organic soils

- 260m east of Access Track 2 at chainage 3200m;
- 30m south of Access Track 5 at chainage 4900m.

1.5.29 The areas noted above, as being marginally unstable or unstable, are considered to have favourable topography and to be sufficiently distant from the Proposed Development. As such, general good practice construction mitigation measures are considered sufficient to mitigate any residual risk of peat slide based on the Limit Equilibrium analysis. General good practice mitigation is discussed in **Section 1.8.**

Landslide Susceptibility Approach

1.5.30 The landslide susceptibility approach (LSA) is based on the layering of contributory factors to produce unique 'slope facets' that define areas of similar susceptibility to failure. The number and size of slope facets will vary from one part of a site to another according to the complexity of ground conditions. As with the limit equilibrium approach, facets were only defined in areas of true peat.

1.5.31 Eight contributory factors are considered in the analysis:

- slope angle (S);
- peat depth (P);
- substrate geology (G);
- peat geomorphology (M);
- drainage (D);
- forestry (F);
- slope convexity (C); and
- land use (L).

1.5.32 For each factor, a series of numerical scores between 0 and 3 are assigned to factor 'classes', the significance of which is tabulated for each factor. The higher a score, the greater the contribution of that factor to instability for any particular slope facet. Scores of 0 imply neutral / negligible influence on instability.

1.5.33 Factor scores are summed for each slope facet to produce a peat landslide likelihood score (SPL), the theoretical maximum being 24 (8 factors, each with a maximum score of 3):

SPL = SS + SP + SG + SM + SD + SF + SC + SL

1.5.34 In practice, a maximum score is unlikely, as the chance of all contributory factors having their highest scores in one location is very small.

1.5.35 Figures to show the spatial distribution of each factor across the Site are shown in **Figures 8.7.7.1 to 8.7.7.8** of this report.

1.5.36 Findings of the LSA are shown in **Figure 8.7.8.**

Slope Angle

1.5.37 **Table 8.7.2** shows the slope ranges, their significance and related scores for the slope angle contributory factor. Slope angles were derived from the 5 m DTM and scores assigned based on reported slope angles associated with peat landslides rather than a simplistic assumption that 'the steeper a slope, the more likely it is to fail'.

Table 8.7.2: Slope Classes, Significance and Scores

Slope Range (°)	Significance	Score
>20.0	Failure typically occurs as peaty debris slides due to low thickness of peat	1
15.1-20.0	Failure typically occurs as peaty debris slides due to low thickness of peat	2
10.1-15.0	Failure typically occurs as peat slides, bog slides or peaty debris slides, a key slope range for reported population of peat failures	3
5.1-10.0	Failure typically occurs as peat slides, bog slides or peaty-debris slides, a key slope range for reported population of peat failures	3
2.1-5.0	Failure typically occurs as bog bursts, bog flows or peat flows; peat slides and peaty debris slides rare due to low slope angles	2
≤2.0	Failure is very rarely associated with flat ground, neutral influence on stability	0

1.5.38 **Figure 8.7.7.1** shows the distribution of slope angle scores across the Site where peat is mapped at greater than 0.5m depth. Where slopes are mapped, angle varies between 0° and 20° with some localised steeper gradients around hill and watercourse formations.

Peat Depth (P)

1.5.39 **Table 8.7.3** shows the peat depths, their significance and related scores for the peat depth contributory factor. Peat depths were derived from the peat depth model shown on **Figure 8.7.7.2** and reflect the peat depth ranges most frequently associated with peat slides (Evans and Warburton, 2007)[20].

Table 8.7.3: Peat Depth Classes, Significance and Scores

Depth Range (m)	Significance	Score
>1.5	Sufficient thickness for any type of peat failure	2
1.0-1.5	Sufficient thickness for peat slide or bog slide	3
0.5-1.0	Sufficient thickness for peat or bog slide and peaty-debris slide but not for bog burst	3
<0.5	Organic soil rather than peat, failures would be peaty-debris slides	1
No Organic Soil	No organic soil and therefore failures cannot be interpreted as peat slides, neutral influence on stability	0

1.5.40 **Figure 8.7.7.2** shows the distribution of peat depth scores across the Site. The results indicate that the Site is predominantly covered by peat thicknesses <0.5 m.

1.5.41 All Turbines (including associated hardstanding areas) encountered peat over 0.5 m in depth with exception of Turbine 4, Turbine 10, Turbine 17 and Turbine 21.

1.5.42 Peat depth varies beneath access tracks across the Site. Over 1.5 m of peat is mapped underlying access tracks, at the following track chainage locations (for track chainages please refer to **Figure 8.7.10**):

- Access Track 6 between chainage 100 m and 400 m;
- Access Track 5 between chainage 4600 m and 4900 m;

[20] Evans, M & Warburton, J 2007, Geomorphology of Upland Peat: Erosion, Form and Landscape Change.P104-135

Substrate Geology

1.5.43 **Table 8.7.4** shows substrate type, significance and related scores for the peat depth contributory factor. The shear surface or failure zone of peat failures typically overlies an impervious clay or mineral (bedrock) base giving rise to impeded drainage. This, in part, is responsible for the presence of peat, but also precludes free drainage of water from the base of the peat mass, particularly under extreme conditions (such as after heavy rainfall, or snowmelt).

1.5.44 Peat failures are frequently cited in association with glacial till deposits in which an iron pan is observed in the upper few centimetres. They have also been observed over glacial till without an obvious iron pan, or over impermeable bedrock. They are rarely cited over permeable bedrock, probably due to the reduced likelihood of peat formation.

Table 8.7.4: Substrate Geology Classes, Significance and Scores

Substrate Geology	Significance	Score
Glacial Till With Iron Pan	Failures often associated with underlying till; particularly where impermeable iron pan provides polished shear surface	3
Glacial Till	Failures often associated with underlying till	2
Impermeable Bedrock	Failures sometimes associated with bedrock, particularly if smooth top surface	1
Permeable Bedrock	Failures rarely associated with permeable bedrock (peat is often thin or absent), neutral influence on stability	0

1.5.45 **Figure 8.7.7.3** shows the distribution of substrate geology scores across the Site. Glacial Till and impermeable bedrock are frequently encountered below Turbines and associated hardstanding locations. Permeable bedrock is encountered more frequently to the east of the Site.

Peat Geomorphology

1.5.46 **Table 8.7.5** shows the geomorphological features identified across the Site, their significance and related scores.

Table 8.7.5: Peat Geomorphology Classes, Significance and Scores

Geomorphology	Significance	Score
Adjacent/upslope (<50 m) to existing instability (peat slide, peaty-debris slide, bank failure)	Failures often associated with underlying till; particularly where impermeable iron pan provides polished shear surface	3
Incipient instability (tension crack, compression ridge, bulging, quaking bog)	Failures are likely to occur where incipient failure morphology is observed	3
Undrained intact planar peat	Failures are most frequently recorded in intact peat, planar peat	2
Diffuse natural drainage / pool / flush	Failures are often associated with areas of diffuse subsurface drainage (such as flushes)	2
Pipe / Collapsed Pipe	Failures are often associated with areas of soil piping	2
Existing Peat Slide	Failures typically stabilise and do not reactivate after the initial event	1
Gullied / Dissected / Hagged / Eroded Peat / Bare Peat / Bare Ground	Failures are rarely recorded in peat fragmentated by erosion	1

1.5.47 **Figure 8.7.7.4** shows the distribution of geomorphology scores across the Site. The results indicate evidence of existing Peat Slide/Hag/Peat Cutting/Bare Ground across various sections of the Proposed Development. Turbines 9, 13 and 16 are situated in areas of Flush/Diffuse Drainage.

Drainage (D)

1.5.48 **Table 8.7.6** shows artificial drainage feature classes, their significance and related scores. Transverse/oblique drainage lines may reduce peat stability by creating lines of weakness in the peat slope and encouraging the formation of peat pipes. Review of published literature indicates that a number of peat failures have been identified which have failed over moorland grips. The influence of changes in hydrology become more pronounced the more transverse the orientation of the drainage lines are relative to the overall slope.

Table 8.7.6: Drainage Feature Classes, Significance and Scores

Significance	Score
Failures are sometimes reported in association with artificial drains oblique/transverse to slope	3
Failures are rarely associated with artificial drains parallel to slope	1
Neutral influence on stability	0

1.5.49 **Figure 8.7.7.5** shows the distribution of drainage feature scores across the Site. All drains are noted to be aligned to the slope.

Forestry (F)

1.5.50 **Table 8.6.7** shows forestry classes, their significance and related scores.

Table 8.7.7: Forestry Classes, Significance and Scores

Forestry Class	Significance	Score
Afforested area (with mature trees), ridge and furrows oblique to slope	Peat underlying forestry stands with rows aligned oblique to slope has inter ridge cracks which are conducive to slope instability	2
Afforested area (with mature trees), ridge and furrows aligned to slope	Peat underlying forestry stands with rows aligned with slope is conducive to slope instability, but less so than where rows are aligned oblique to slope	1
Deforested area (few or no trees), ridge and furrows oblique to slope	Peat underlying deforested stands has a higher water table and more neutral buoyancy, but retains inter ridge cracks (lines of weakness) conducive to instability; alignment of cracks oblique to slope is most conducive to instability	3
Deforested area (few or no trees), ridge and furrows aligned to slope	Peat underlying deforested stands has a higher water table and more neutral buoyancy, but retains inter ridge cracks (lines of weakness), however, orientation of these cracks is less critical when aligned to slope	2
Not Afforested	Neutral influence on stability	0

1.5.51 **Figure 8.7.7.6** shows the distribution of forestry feature scores. Most of the Site is not afforested. One small, deforested area aligned to the slope is noted in the forestry 700 m south of Borrow Pit 2.

Slope Convexity (C)

1.5.52 **Table 8.7.8** shows profile convexity classes, significance and related scores. Convex and concave slopes (i.e., positions in a slope profile where slope gradient changes by a few degrees) can be associated with the initiation point of peat landslides. Convexities are often associated with thinning of peat; such that thicker peat upslope applies stresses to thinner 'retaining' peat downslope. Conversely, buckling and tearing of peat may trigger failure at concavities (Dykes and Warburton, 2007[21]). However, review of reported peat landslide locations against Google Earth elevation data (Mills and Rushton, 2023[22]) indicates that the majority of peat slides occur on rectilinear (uniform) slopes and that the reporting of convexity as a key driver may be misleading. Therefore, rectilinear slopes are assigned the highest score within this assessment.

Table 8.7.8: Convexity Feature Classes, Significance and Scores

Convexity Feature	Significance	Score
Rectilinear Slope	Peat slides are most frequently reported on rectilinear slopes, while Bog bursts are often reported on rectilinear slopes	3
Convex Slope	Peat failures are often reported on or above convex slopes	2
Concave Slope	Peat failures are occasionally reported in association with concave slopes	1
Undulating ground	Peat failures are rarely reported on undulating ground. A neutral influence on peat stability is assumed for this assessment	0

1.5.53 **Figure 8.7.7.7** shows the distribution of convexity feature scores across the Site. Slopes are shown to be predominantly rectilinear in nature across the Site with interspersed areas of undulating ground.

Land use (L)

1.5.54 **Table 8.6.9** shows land use classes, significance and related scores. A variety of land uses have been associated with peat failures which form the scoring and potential for failure.

Table 8.7.9: Land Use Feature Classes, Significance and Scores

Land Use	Significance	Score
Cutting / Turbary	Peat failures are often associated with peat cuttings/turbary	3
Adjacent Quarrying	Failures are occasionally reported adjacent to quarries (usually as bog bursts, bog flows or peat flows)	2
Burning	Failures are rarely associated with burning though this activity may create pathways for water to the base of peat	1
Other Land Use	Failures are rarely associated with other forms of land use	0

1.5.55 **Figure 8.7.7.8** shows the distribution of land use feature scores across the Site. Most of the Site is noted as ‘Other Land Use’ with a small area noted as ‘Cutting/Turbary’ situated approximately 100 m south-west of Turbine 15.

LIKELIHOOD SCORES

1.5.56 The eight contributory factor layers were combined in GIS software to produce likelihood scores for a peat landslide as shown on **Figure 8.7.8**. These likelihood scores were then converted into descriptive ‘likelihood classes’ from ‘Very Low’ to ‘Very High’ with a corresponding numerical range of 1 to 5, and are described in **Table 8.7.10** below.

Table 8.7.10: Likelihood Classes Derived from the Landslide Susceptibility Methodology

Summed Contributory Factor Scores	Typical Site Conditions Associated with Score	Qualitative Likelihood	Peat Landslide Likelihood Score
≤8	Unmodified peat with no more than low weightings for peat depth, slope angle, underlying geology and peat morphology	Very Low	1
8-13	Unmodified or modified peat with no more than moderate or some high scores for peat depth, slope angle, underlying geology and peat morphology	Low	2
14-18	Unmodified or modified peat with high scores for peat depth and slope angle and / or high scores for at least three other contributory factors	Moderate	3
19-21	Modified peat with high scores for peat depth and slope angle and several other contributory factors	High	4
>21	Modified peat with high scores for most contributory factors (unusual except in areas with evidence of incipient instability)	Very High	5

1.5.57 **Table 8.7.10** describes the basis for the likelihood classes. Professional judgement was made that, for a facet to have a moderate or higher likelihood of a peat landslide, a likelihood score would be required equivalent to both the worst case peat depth and slope angle scores (3 in each case, i.e. 3 x 2 classes) alongside three intermediate scores (of 2, i.e. 2 x 3 classes) for other contributory factors. This means that any likelihood score of 14 or greater would be equivalent to at least a moderate likelihood of a peat landslide. Given that the maximum score attainable is 24, this seems reasonable.

1.6 Peat Slide Risk Assessment and Mitigation

1.6.1 **Table 8.7.11** below defines the stability risk assessment based on the peat slide likelihood and the required mitigation actions for each Risk Level.

Table 8.7.11: Risk Assessment

Peat Slide Likelihood	Potential Stability Risk (Pre-Mitigation)	Mitigation Action
Very Low	Very Low	No peat present>0.5 m and therefore no mitigation action required.
Low	Unlikely/Low	Development of a site-specific construction and management plan for peat areas
Moderate	Likely/Medium	As for Low condition plus may require mitigation to improve site conditions.
High	Probable High	Unacceptable level of risk, the area should be avoided. If unavoidable, detailed investigation and quantitative assessment required to determine stability with long term monitoring.
Very high	Almost Certain/Very high	Unacceptable level of risk, the area should be avoided

1.6.2 **Table 8.7.12** below shows the risk level (Likelihood) and required mitigation measures proposed for the turbines and proposed access tracks of the Proposed Development. Refer to **Figure 8.7.10** for location of access tracks.

[21] Dykes, A. and Warburton, J. 2007. Mass movements in peat: A formal classification scheme. Geomorphology, 86, 73-93)

[22] Mills, A.J. and Rushton, D. 2023. A risk-based approach to peatland restoration and peat instability. NatureScot Research Report 1259

Table 8.7.12: Risk Level (Likelihood) and Mitigation				
Wind Farm Infrastructure				
Turbine / Infrastructure	**Slope Angle Deg (Mean)**	**Peat Depth m (Max)**	**Risk Level**	**Comment / Mitigation**
Turbine Locations				
Turbine 1	10.82	1.37	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 2	8.55	0.75	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 3	6.67	1.40	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 4	9.27	0.60	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 5	6.98	0.90	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 6	8.08	0.82	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 7	4.14	0.91	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 8	5.84	0.82	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 9	8.22	1.03	Moderate	Moderate risk level based upon peat slide likelihood assessment. (Refer to specific mitigation measures, Section 1.8). FoS assessment considers the ground to be stable.
Turbine 10	11.68	0.51	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 11	7.46	1.00	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 12	8.00	0.90	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 13	8.60	0.60	Moderate	Moderate risk level based upon peat slide likelihood assessment. (Refer to specific mitigation measures, Section 1.8). FoS assessment considers the ground to be stable.
Turbine 14	6.97	0.51	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 15	9.58	1.10	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 16	3.57	0.80	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 17	6.35	0.51	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 18	7.03	0.80	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 19	4.89	0.75	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 20	5.20	1.07	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Turbine 21	6.45	0.75	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Compounds/Substation & Borrow Pit				
Borrow Pit Search Area - BP1	12.57	0.71	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Borrow Pit Search Area - BP2	9.97	0.65	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Borrow Pit Search Area - BP3	11.21	1.00	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Borrow Pit Search Area - BP4	11.37	0.90	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Indicative Construction Compound - CC4	6.56	0.61	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Indicative Construction Compound - CC3	6.72	1.29	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Indicative Construction Compound - CC2	3.27	0.44	Very Low	No peat recorded>0.5 m depth. No mitigation required.
Indicative Construction Compound - CC1	7.08	0.66	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)

Substation	7.02	0.85	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
BESS	7.23	0.82	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Access Tracks				
New Standard Track - Access Track 1 (0-625 m)	10.70	0.21	Very Low	No peat recorded>0.5 m depth. No mitigation required
New Standard Track - Access Track 1 (1,150-1,850 m)	7.56	0.56	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 1 (1,900-2,000 m)	10.32	0.35	Very Low	No peat recorded>0.5 m depth. No mitigation required
New Standard Track - Access Track 1 (3,150 m - end)	10.31	0.60	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 1 (Spur CC3)	5.16	0.20	Very Low	No peat recorded>0.5 m depth. No mitigation required
Upgraded Track - Access Track 1 (1,850-1,900 m)	10.99	0.17	Very Low	No peat recorded>0.5 m depth. No mitigation required
Upgraded Track - Access Track 1 (2,000-2,500 m)	5.51	0.53	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Upgraded Track - Access Track 1 (2,500-2,950 m)	5.33	0.64	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Upgraded Track - Access Track 1 (2,950-3,150 m)	6.57	1.16	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Upgraded Track - Access Track 1 (625 - 1,150 m)	9.94	0.17	Very Low	No peat recorded>0.5 m depth. No mitigation required
New Standard Track - Access Track 2 (0-500 m)	9.72	0.60	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 2 (1,000-1,500m)	10.26	0.70	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 2 (1,500-2,000 m)	12.60	0.45	Very Low	No peat recorded >0.5m in depth. No mitigation measures required.
New Standard Track - Access Track 2 (2,000-2,500 m)	10.30	0.93	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 2 (2,500-3,000 m)	11.15	1.16	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 2 (3,000 m - end)	7.73	0.52	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 2 (500-1,000 m)	10.62	0.45	Very Low	No peat recorded>0.5 m depth. No mitigation required.
New Standard Track - Access Track 3 (0-500 m)	8.80	0.76	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 3 (1,000 m - end)	6.76	0.89	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 3 (500-1,000 m)	8.99	0.80	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 4 (0-500 m)	13.09	0.96	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 4 (1,000-1,500 m)	6.33	1.16	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 4 (1,500-1,900 m)	10.71	0.53	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 4 (2,700-3,000 m)	9.87	1.20	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 4 (3,000-3,500m)	15.24	0.94	Low	Deep peat >0.5 m recorded, Slope <20 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 4 (3,500-4,000 m)	12.06	1.19	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 4 (4,000-4,500 m)	8.58	0.90	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)

New Standard Track - Access Track 4 (4,500-5,000 m)	7.53	1.16	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 4 (5,000-5,450 m)	3.19	0.72	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 4 (5,450-5,800 m)	10.34	0.51	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 4 (500-1,000 m)	7.96	1.34	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 4 (Spur T1)	12.30	0.97	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 4 (Spur T3)	7.22	1.55	Moderate	Moderate risk level based upon peat slide likelihood assessment. (Refer to specific mitigation measures, Section 1.8). FoS assessment considers the ground to be stable.
New Standard Track - Access Track 4 (Spur T4)	7.67	1.15	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 4 (Spur T6)	9.40	0.58	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 4 (Spur T8)	5.34	0.82	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Upgraded Track - Access Track 4 (1,900-2,400 m)	8.67	0.60	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Upgraded Track - Access Track 4 (2,400 - part of spur to T4)	7.95	1.80	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Floating Track - Access Track 5 (4,650-4,950 m)	1.90	3.70	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 5 (0-500 m)	6.78	0.51	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 5 (1,000-1,500 m)	3.01	1.06	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 5 (1,500-2,000 m)	5.56	0.80	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 5 (2,000-2,500 m)	8.85	0.71	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 5 (2,500-3,000 m)	5.56	0.68	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 5 (3,000-3,550 m)	6.20	2.02	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 5 (3,550-4,000 m)	10.71	0.21	Very Low	No peat recorded>0.5 m depth. No mitigation required
New Standard Track - Access Track 5 (4,000-4,650 m)	7.10	0.85	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 5 (4,950-5,700 m)	4.56	0.96	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 5 (500-1,000 m)	6.92	0.60	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 5 (6,050-6,400 m)	8.57	1.10	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 5 (6,400-6,900 m)	9.98	0.82	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 5 (Spur T10)	11.45	0.55	Low	Deep peat >0.5 m recorded, Slope <15 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 5 (Spur T15)	9.01	0.59	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 5 (Spur T18)	5.59	0.64	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Upgraded Track - Access Track 5 (5,700-6,050 m)	5.77	0.84	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)

Upgraded Track - Access Track 5 (6,900-7,050 m)	12.26	0.32	Very Low	No peat recorded>0.5 m depth. No mitigation required
New Floating Track - Access Track 6 (100-400 m)	1.80	2.46	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 6 (0-100 m)	5.87	0.57	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 6 (400-1,100 m)	7.05	0.91	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 6 (Spur T19)	4.80	0.85	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 6 (Spur T21)	5.13	0.82	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 7 (0-50 m)	6.52	0.17	Very Low	No peat recorded>0.5 m depth. No mitigation required
New Standard Track - Access Track 7 (250-350 m)	4.80	0.23	Very Low	No peat recorded>0.5 m depth. No mitigation required
New Standard Track - Access Track 7 (550-900 m)	4.18	0.33	Very Low	No peat recorded>0.5 m depth. No mitigation required
New Standard Track - Access Track 7 (Spur T13)	7.13	1.13	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 7 (Tip of Turning Head at T9)	2.83	0.70	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
Upgraded Track - Access Track 7 (350-550 m)	5.66	0.26	Very Low	No peat recorded>0.5 m depth. No mitigation required
Upgraded Track - Access Track 7 (50-250 m)	5.35	0.33	Very Low	No peat recorded>0.5 m depth. No mitigation required
Upgraded Track - Access Track 7 (900-1,400 m)	9.27	0.38	Very Low	No peat recorded>0.5 m depth. No mitigation required
Upgraded Track - Access Track 7 (Spur T9)	7.66	0.72	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)
New Standard Track - Access Track 8 (Spur T11)	8.76	0.89	Low	Deep peat >0.5 m recorded, Slope <10 degrees. Low Likelihood. (Refer Section 1.8 for General Good Practice Mitigation Measures)

1.6.3 **Table 8.7.13** shows that the majority of the Site has either "low" or "very low" likelihood of peat slide. Several areas moderate likelihood have been identified associated with sections of the proposed Access Tracks. These areas are summarised in **Table 8.7.13** below.

Table 8.7.13: Moderate and High Risk Level (Likelihood) and Mitigation Elements				
Wind Farm Infrastructure				
Turbine / Infrastructure	**Peat Depth m (Max)**	**Slope Angle Deg (Mean)**	**Risk Level**	**Comment / Mitigation**
Turbines				
Turbine 9	8.22	1.03	Moderate	Moderate risk level based upon peat slide likelihood assessment. (Refer to specific mitigation measures, Section 1.8). FoS assessment considers the ground to be stable.
Turbine 13	8.60	0.60	Moderate	Moderate risk level based upon peat slide likelihood assessment. (Refer to specific mitigation measures, Section 1.8). FoS assessment considers the ground to be stable.
Access Tracks				
New Standard Track - Access Track 4 (Spur T3)	7.22	1.55	Moderate	Moderate risk level based upon peat slide likelihood assessment. (Refer to specific mitigation measures, Section 1.8). FoS assessment considers the ground to be stable.

Results

1.6.4 Both the Factor of Safety Assessment and the Landslide Susceptibility Approach broadly agree that the majority of the Proposed Development is assessed as "low" or "very low" likelihood of peat slide.

1.6.5 Within the Landslide Susceptibility Approach **(Figure 8.7.8)**, three areas of the Proposed Development have been assigned a moderate risk of peat landslide, as per **Table 8.7.13**.

1.6.6 The Factor of Safety assessment **(Figure 8.7.6)** identified no areas of instability to be underlying the areas identified in **Table 8.7.13**.

1.6.7 Despite the areas of the Site shown to be stable as part of the Factor of Safety assessment, the more onerous/worst-case findings of the landslide susceptibility approach have been assumed.

1.6.8 Where moderate risk areas exist, specific mitigation measures as outlined within Section 1.8 will need to be adopted to mitigate potential peat slide risk.

1.6.9 In order for there to be a 'High' or 'Medium' risk associated with the Proposed Development, combined peat landslide likelihood must be 'Moderate' or higher at an infrastructure location, as defined by Scottish Government Guidance[1].

1.6.10 Where combined peat landslide likelihoods and FoS results are assessed as 'Low' or 'Very Low', post-consent site investigations and application of good practice construction mitigation methods should be employed prior to and during construction as detailed in Section 1.8 below. Specific mitigation methods for areas assessed as 'Moderate' likelihood are also detailed in Section 1.8.

1.7 Consequence Evaluation

1.7.1 Based on the assessment of consequence of risk methodology, as defined by the Scottish Government Best Practice Guidance[1], five receptors have been identified at the Site, and are assessed for consequence in Table 8.6.14 below:

- Watercourses;
- Private Water Supplies (PWS);
- Non-riverine habitats;
- Residential properties;
- B797 Highway; and
- Proposed development infrastructure.

Table 8.6.14: Assessment of Consequence and Risk

Receptor	Consequence	Score	Justification for Score	Consequence Scale
Watercourse – Coom Burn, 190 m South of Turbine 13 (OS: 291,123 618,839 Meters)	Increased erosion as a result of peat sliding leading to turbidity and acidification with potential to cause fish kill, or lead to blockage of drainage.	4	Blockage of drainage or degradation of water quality and increased Flood risk	High
Private Water Supply - PWS Waterhead 158 m East of Turbine 2 (OS: 288,437 618,381 Meters)	Medium term loss of PWS source, pollution of PWS or blockage of drainage.	4	Blockage or degradation of water quality to PWS	High
Non Riverine Habitat - Site of Specific Scientific Interest - Raven Gill 270 m North-East of Turbine 9 (OS: 292,301 619,892 Meters)	Damage/disruption to a critical area of geological history of the Southern Upland	3	Given the nature of the geological feature, the effects of peat landslides are generally short in duration.	Moderate
Residential Property - Shortcleugh Farm 655 m South-East of Standard Track – Access Track 5: Chainage 5620 m (OS: 292,778 617,360 Meters)	Medium term loss of residency for local occupants. Significant cost to restore property and temporary accommodation. Possible injury, loss of life to occupants.	5	Loss of life, though unlikely, is a severe consequence; financial implications of damage and repair to residents' property are less significant.	Extremely High
Highway - (B797) 610 m East of Turbine 2 Hardstanding (OS: 288,875 618,339 Meters)	Medium term loss of access for transport link. Significant cost to restore highway infrastructure and public access. Possible injury, loss of life to users.	5	Loss of life, though unlikely, is a severe consequence; financial implications of damage and repair to highway are less significant.	Extremely High
Proposed Development – Turbine 9 Underlying the proposed turbine hardstanding (0m) (OS: 291,831 619,517 Meters)	Damage to infrastructure, possible injury, loss of life	5	Loss of life, though unlikely, is a severe consequence; financial implications of damage and repair to infrastructure are less significant.	Extremely High

1.7.2 Three areas of moderate likelihood of peat slide are identified directly at Access Track locations. Receptors shown in **Figure 8.7.9** have been included in **Table 8.7.15** below to confirm the evaluation for the level of risk associated with the Proposed Development.

Table 8.7.15 Risk levels derived from Likelihood vs Consequence

Receptor	Qualitative Likelihood worst case (See Table 8.7.13)	Consequence Scale / Score (See Table 8.7.14)	Risk Level	Minimum Distance to Receptor	Level of Mitigation Required	Risk Level (Post Mitigation)
Watercourse (OS: 291,123 618,839 Meters)	Moderate	High	Moderate	Coom Burn 190m south of Turbine 13	Specific mitigation, refer to Section 1.8	Low
Private Water Supply (OS: 288,437 618,381 Meters)	Low	High	Low	PWS Shortcleugh 300 m South-East of Standard Track - Access Track 5: Chainage 5620m	Specific mitigation, refer to Section 1.8	Low
Non Riverine Habitat (OS: 292,301 619,892 Meters)	Moderate	Moderate	Low	Raven Gill - 305 m North-East of Turbine 9	Specific mitigation, refer to Section 1.8	Low
Residential Property (OS: 292,778 617,360 Meters)	Low	Extremely High	Low	Shortcleugh Farm 655 m South-East of Standard Track – Access Track 5: Chainage 5620m	Specific mitigation, refer to Section 1.8	Low
Highway (B797) (OS: 288,875 618,339 Meters)	Low	Extremely High	Low	610 m East of Turbine 2 Hardstanding	Specific mitigation, refer to Section 1.8	Low
Proposed Development – Turbine 9 (OS: 291,831 619,517 Meters)	Moderate	Extremely High	Moderate	Underlying Turbine 9 hardstanding	Specific mitigation, refer to Section 1.8	Low

1.7.3 The risk levels identified above for each potential receptor are based on the worst-case likelihood and closest proximity to the receptor. The risk level is considered to be Moderate for the Watercourse and the Proposed Development. The Private Water Supply (PWS), Non-Riverine Habitat, Residential Property and Highway risk level is considered to be Low, based on:

- proximity of potential for unstable ground from infrastructure location;
- level and slope angle both up and down slope; and
- run out distances to potential receptors (Refer to **Figure 8.7.9**).

1.7.4 Implementing specific mitigation measures would lower the post mitigation risk to low for the receptors identified as moderate risk. The specific mitigation measures are described in Section 1.8.

1.7.5 Based on the combined Qualitative likelihood vs Consequence and the findings within the FoS/Limit Equilibrium assessment **(Figure 8.7.6)** previously outlined, it is considered that the combined risk level of peat landslide in association with the construction of the Proposed Development is assessed as being Low risk once specific and general mitigation measures are implemented. This assessment of Risk level is based on Low likelihood or Moderate likelihood vs High or Extremely High consequence as outlined in Table 5.3 of ECU best practice guidance[1], as shown in **Table 8.7.16.**

Table 8.7.16 Indicative Risk Level

		Adverse Consequence				
Peat Landslide Probability or Likelihood	**Receptor**	**Extremely high**	**High**	**Moderate**	**Low**	**Very Low**
	Very High (Almost certain)	High	High	Moderate	Moderate	Low
	High (Probable)	High	Moderate	Moderate	Low	Negligible
	Moderate (Likely)	Moderate	Moderate	Low	Low	Negligible
	Low (Unlikely)	Low	Low	Low	Negligible	Negligible
	Very Low (Negligible)	Low	Negligible	Negligible	Negligible	Negligible

1.8 Mitigation Measures

Specific Mitigation Methods

1.8.1 Three sections of the development have been identified as moderate risk based on the Landslide Susceptibility Approach. Micrositing of infrastructure following additional post-consent ground investigation and detailed design to reduce potential risk associated with construction in areas of moderate risk should be considered. Where micrositing is not practicable then excavation of the peat would be required to mitigate the areas of moderate risk.

1.8.2 General good practice should be applied across the Site to engender awareness of peat instability and enable early identification of potential displacements and opportunities for mitigation.

General Mitigation Measures

1.8.3 A comprehensive intrusive geotechnical assessment should be undertaken post-consent based on the combined ground investigation, to support the engineering design of turbine foundations, tracks and ancillary infrastructure for the Proposed Development.

1.8.4 Appropriate field and laboratory testing would also be undertaken as part of the comprehensive ground investigation to confirm the peat stability baseline across the Site to cover the areas affected by the tracks and ancillary infrastructure, and further design mitigation used as appropriate to reduce the likelihood of peat instability (where required).

1.8.5 A geotechnical risk register would be prepared detailing any ground risks identified during the ground investigation and providing mitigation measures as appropriate. The risk register should be considered a live document and updated throughout the phases of the Proposed Development. The monitoring requirements discussed in the following paragraphs would be undertaken by the Contractor.

1.8.6 During construction of the Proposed Development the following mitigation would be undertaken for excavations:

- A geotechnical risk register would be prepared for the Proposed Development following intrusive investigations post consent and location specific stability analyses;
- Site inspections and audits would be undertaken at scheduled intervals to identify any unusual or unexpected changes to ground conditions (which may be associated with construction or which may occur independently of construction);
- All construction activities and operational decisions that involve disturbance to peat deposits would be overseen by an appropriately qualified geotechnical engineer with experience of construction on peat sites;
- Awareness of peat instability and pre-failure indicators would be incorporated in site induction, tool box talks, and training to enable all site personnel to recognise ground disturbances and features indicative of incipient instability;
- Monitoring checklists would be prepared with respect to peat instability addressing all construction activities forming the Proposed Development;
- Use of appropriate supporting structures around peat excavations, where required, (e.g. for towers, crane pads and compounds) to prevent collapse and the development of tension cracks;
- Avoid cutting trenches or aligning excavations across slopes (which may act as incipient back scars for peat failures) unless appropriate mitigation has been put in place;
- Implement methods of working that minimise the cutting of the toes of slope, e.g. working up-to-downslope during excavation works;
- Monitor the ground upslope of excavation works for creep, heave, displacement, tension cracks, subsidence or changes in surface water content;
- Monitor cut faces for changes in water discharge, particularly at the peat-substrate contact; and
- Minimise the effects of construction on natural drainage by ensuring natural drainage pathways are maintained or diverted such that there is no significant alteration of the hydrological regime of the site; drainage plans should avoid creating drainage/infiltration areas or settlement ponds towards the tops of slopes (where they may act to both load the slope and elevate pore pressures).

1.8.7 During construction of the Proposed Development the following mitigation would be undertaken for excavated tracks:

- Maintain drainage pathways through tracks to avoid ponding of water upslope;
- Monitor the top line of excavated peat deposits for deformation post-excavation; and

- Monitor the effectiveness of cross-track drainage to ensure water remains free-flowing and that no blockages have occurred.

1.8.8 During construction of the Proposed Development the following mitigation would be undertaken for floating tracks:

- Allow peat to undergo primary consolidation by adopting rates of road construction appropriate to weather conditions.
- Monitor the effects of secondary compression over the life of the development, where required, while the tracks are utilised (can be up to 40 years) to ensure running surfaces remain elevated above the ground surface and does not cause ponding.
- Identify 'stop' rules, i.e. weather dependent criteria for cessation of track construction based on local meteorological data.
- Run vehicles at 50% load capacity until the tracks have entered the second compression phase.
- Prior to construction, setting out the centreline of the proposed track to identify any ground instability concerns or particularly wet zones.

1.8.9 During construction of the Proposed Development the following mitigation would be undertaken for temporary storage of peat and restoration activities:

- Where practicable, ensure temporary stores of peat are located on non-peat soils to minimise potential for instability of the underlying soils;
- Avoid storing peat on slope gradients >3° and preferably store on ground with neutral slopes and natural downslope barriers to peat movement;
- Monitor effects of wetting/re-wetting stored peat on surrounding peat areas, and prevent water build up on the upslope side of peat mounds; and
- Maximise the interval between material deliveries over newly constructed tracks that are still observed to be within the primary consolidation phase.

1.8.10 During the operational phase of the Proposed Development monitoring of key infrastructure locations would continue through Site walkovers and inspections by the maintenance Contractor to look for signs of unexpected ground disturbance, including:

- Ponding on the upslope side of infrastructure sites and on the upslope side of access tracks;
- Subsidence and lateral displacement of tracks;
- Changes in the character of natural or artificial peat drainage within a 50 m buffer strip of tracks and infrastructure (e.g. development of quaking bog, waterlogging of previously dry drains);
- Blockage or underperformance of the installed site drainage system;
- Slippage or creep of stored peat deposits (including in restored peat cuttings); and
- Development of tension cracks, compression features, bulging or quaking bog anywhere in a 50 m corridor surrounding the site of any construction activities or site works.

1.8.11 Monitoring would be undertaken during construction and as part of the commissioning phase the need for on-going monitoring would be reviewed and any ongoing monitoring requirements identified.

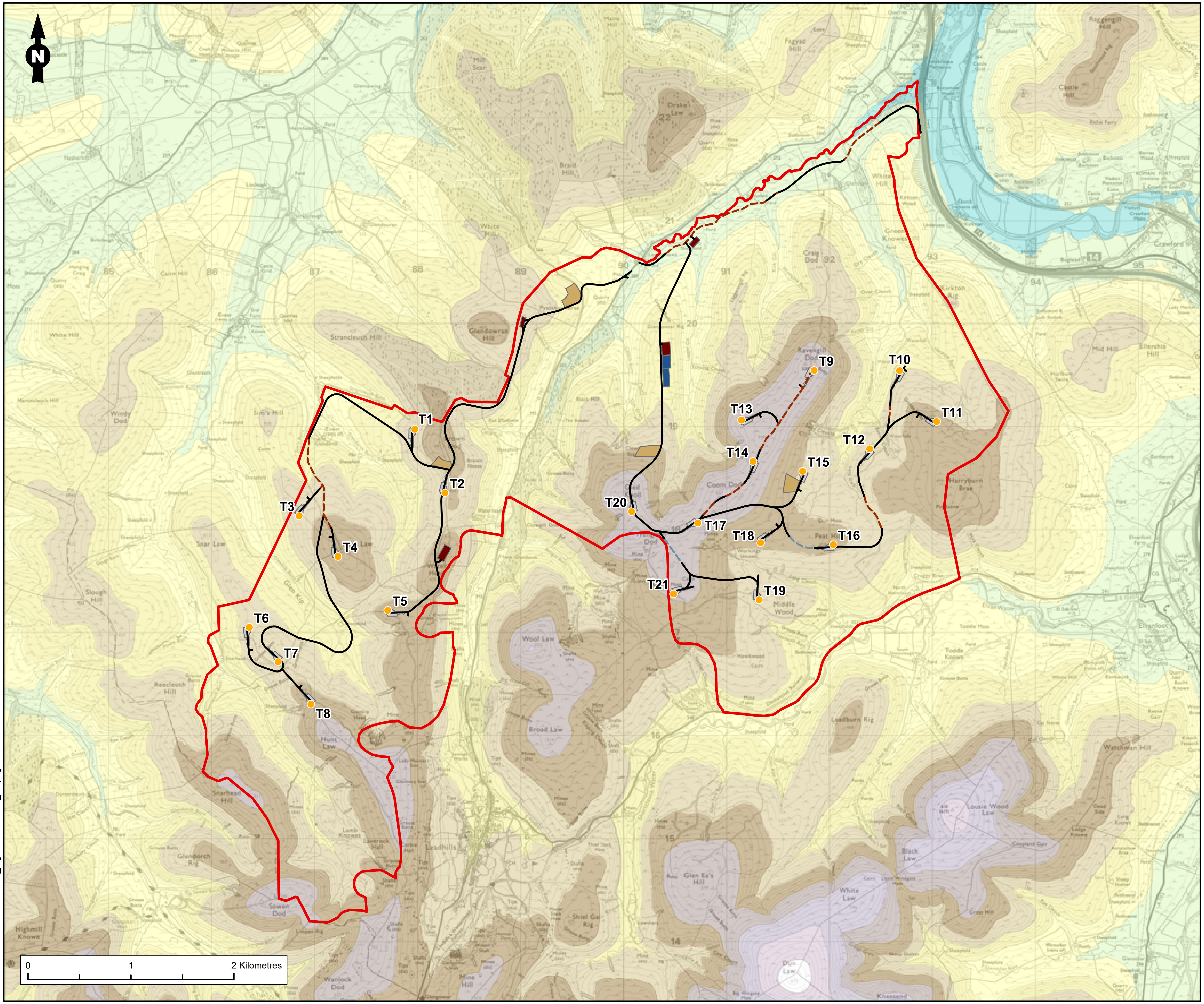
1.9 Conclusion

1.9.1 The Site is considered to be Low or Very Low risk with regards to peat slide risk with the exception of three locations of the Proposed Development which are considered to be Moderate.

1.9.2 It is considered that the general good practice mitigation measures included within Section 1.8 of this Technical Appendix would be sufficient to provide mitigation for Very Low and Low risk areas of the Site.

1.9.3 Where areas at Moderate risk of peat slide have been identified, and are confirmedfollowing post-consent ground investigation, specific mitigation measures including micrositing or removal of peat should be employed to mitigate peat slide risk.

1.9.4 Where new and temporary access tracks cannot be microsited away from areas of peat >0.5 m in depth, the use of floating track construction is proposed to avoid excavation of peat where low or very low likelihood of peat slide has been identified.



Legend

- Site Boundary

Site Layout

- Turbine Layout
- New Standard Track Centreline
- New Floating Track Centreline
- Upgraded Track Centreline
- Turbine Hardstanding
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area

Terrain Height (mAOD)

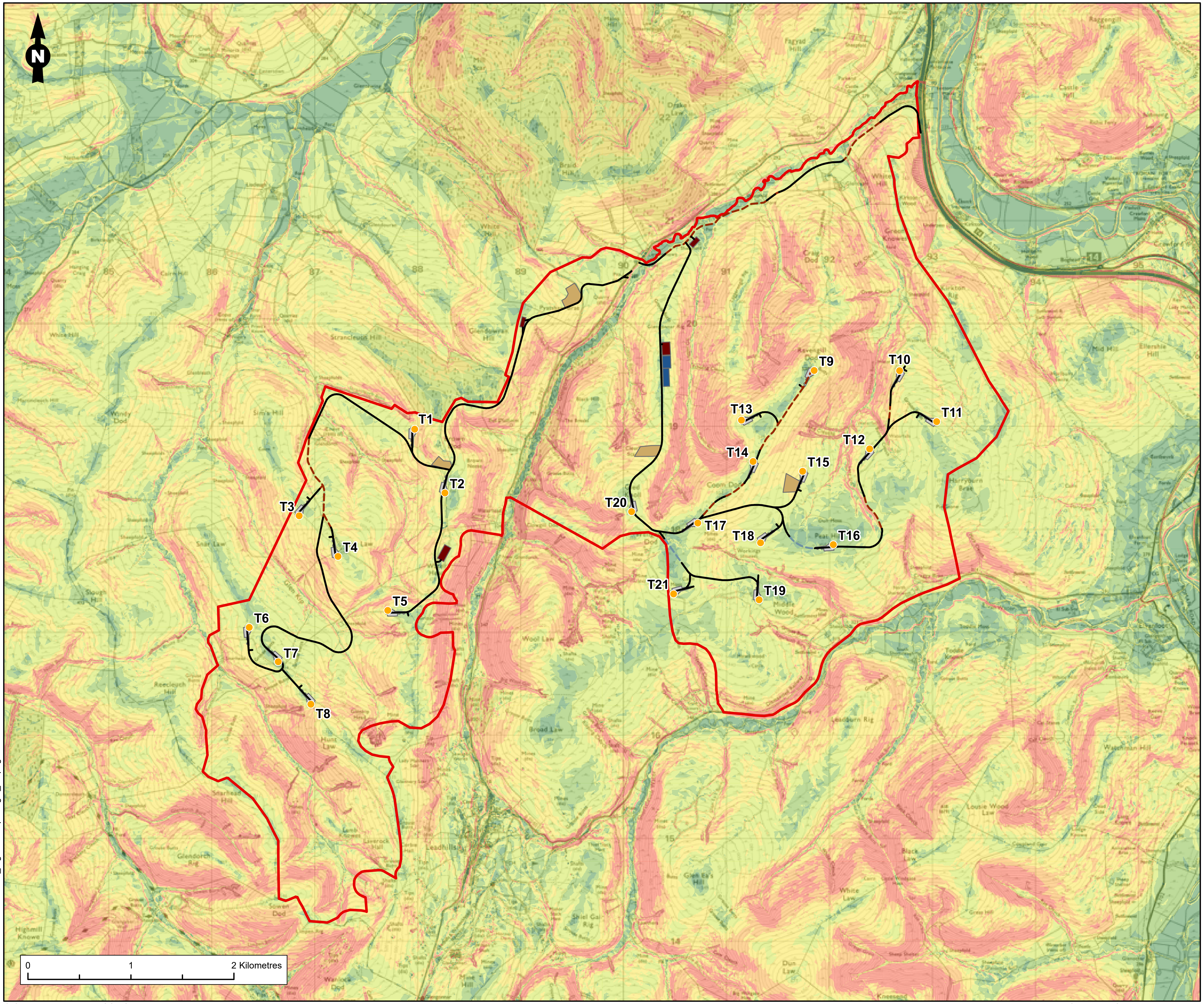
- 650.1 - 700.0
- 600.1 - 650.0
- 550.1 - 600.0
- 500.1 - 550.0
- 450.1 - 500.0
- 400.1 - 450.0
- 350.1 - 400.0
- 300.1 - 350.0
- 250.1 - 300.0
- 232.0 - 250.0

Figure Title		
Elevation		
Project Name		
Ravengill Energy Park		
Project No./Filery ID		
1620017435 / REH2024N04129		
Date: March 2026	Figure No.: 8.7.1	Revision: 1.0
Prepared By: AB	Scale: 1:35,000 @A3	
Client		
Ravengill Energy Park Limited		

RAMBOLL

1620017435-RAM-MA-IA-00023_Fig8.7.1Elevation_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Site Boundary

Site Layout

- Turbine Layout
- New Standard Track Centreline
- New Floating Track Centreline
- Upgraded Track Centreline
- Indicative Hardstanding Envelope
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area

Slope Angle (Degrees)

- 0.1 - 2
- 2.1 - 5
- 5.1 - 10
- 10.1 - 15
- 15.1 - 20
- >20

Figure Title
Slope Angle (Degrees)

Project Name
Ravengill Energy Park

Project No./Filery ID
1620017435 / REH2024N04129

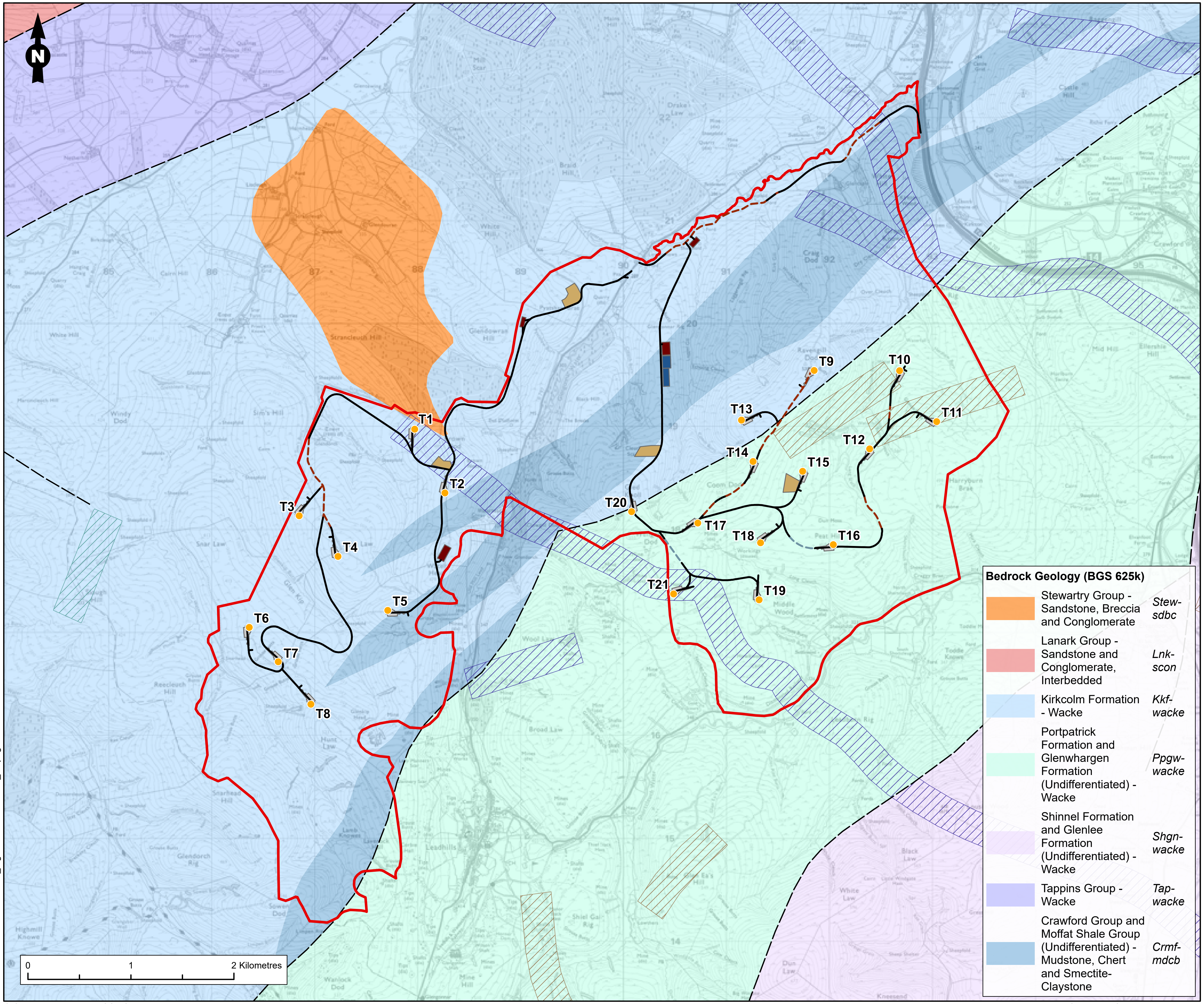
Date	Figure No.	Revision
March 2026	8.7.2	1.0

Prepared By	Scale
AB	1:35,000 @A3

Client
Ravengill Energy Park Limited

1620017435-RAM-MA-IA-00024_Fig8.7.2SlopeAngle_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Bedrock Geology (BGS 625k)

Stewartry Group - Sandstone, Breccia and Conglomerate	*Stew-sdbc*
Lanark Group - Sandstone and Conglomerate, Interbedded	*Lnk-scon*
Kirkcolm Formation - Wacke	*Kkf-wacke*
Portpatrick Formation and Glenwhargen Formation (Undifferentiated) - Wacke	*Ppgw-wacke*
Shinnel Formation and Glenlee Formation (Undifferentiated) - Wacke	*Shgn-wacke*
Tappins Group - Wacke	*Tap-wacke*
Crawford Group and Moffat Shale Group (Undifferentiated) - Mudstone, Chert and Smectite-Claystone	*Crmf-mdcb*

Legend

Site Boundary

Site Layout

- Turbine Layout
- New Standard Track Centreline
- New Floating Track Centreline
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- Indicative Construction Compound
- Borrow Pit Search Area

Fault Lines (BGS 625k)

- Fault at Rockhead

Dykes (BGS 625k)

Unnamed Igneous Intrusion, Palaeogene - Mafic Igneous-Rock	*Uig-mfir*
Unnamed Igneous Intrusion, Late Silurian to Early Devonian - Felsic-Rock	*Uisd-felsr*
Unnamed Igneous Intrusion, Late Silurian to Early Devonian - Mafic Igneous-Rock	*Uisd-mfir*

Figure Title
Bedrock Geology

Project Name
Ravengill Energy Park

Project No./Filery ID
1620017435 / REH2024N04129

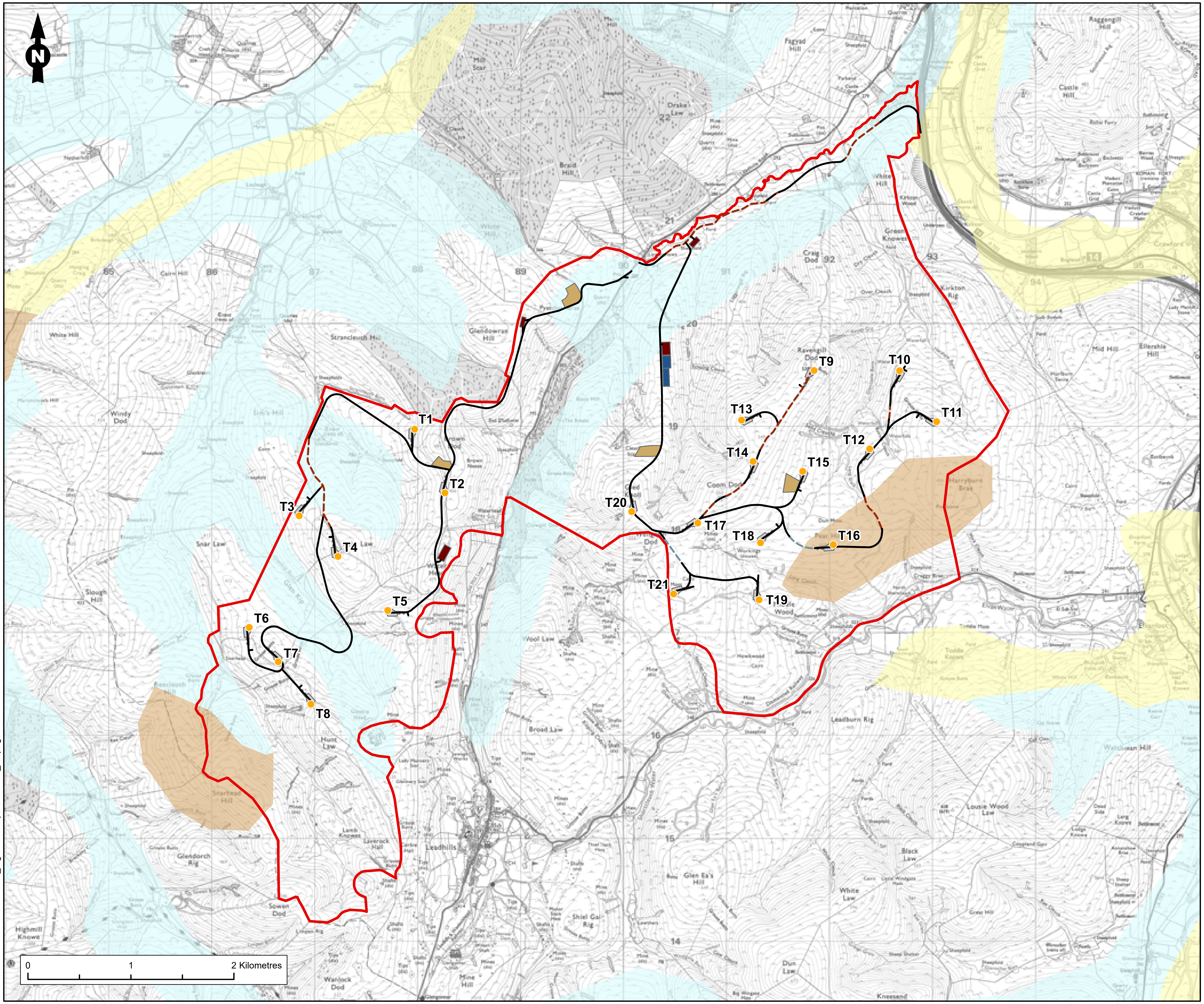
Date	Figure No.	Revision
March 2026	8.7.3.1	1.0

Prepared By	Scale
AB	1:35,000 @A3

Client
Ravengill Energy Park Limited

1620017435-RAM-MA-IA-00025_Fig8.7.3.1BedrockGeo_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

Site Boundary

Site Layout

- Turbine Layout
- New Floating Track Centreline
- New Standard Track Centreline
- Upgraded Track Centreline
- Indicative Hardstanding Envelope
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area

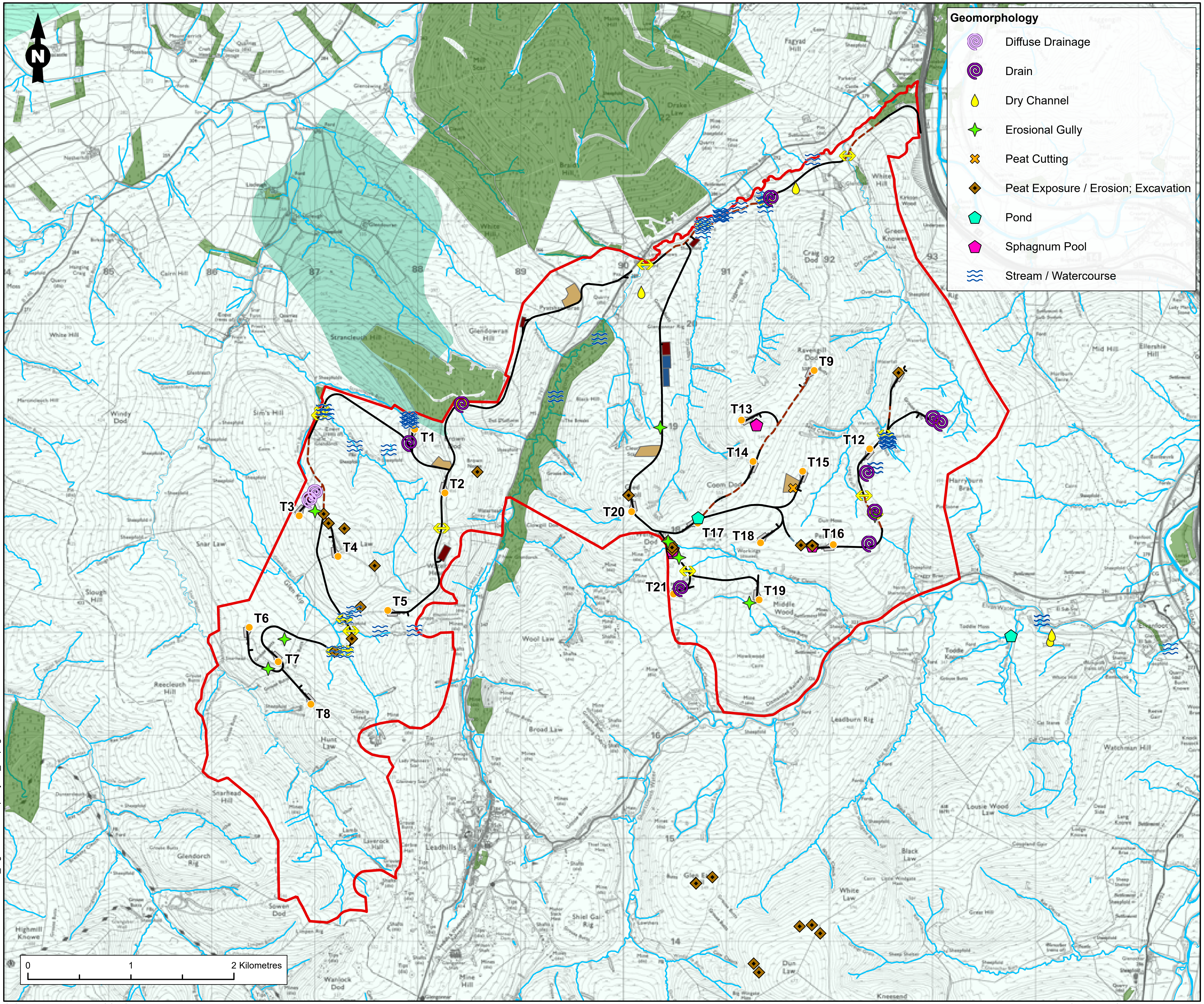
Superficial Geology (BGS 625k)

- Alluvium - Clay, Silt and Sand
- Peat
- Till - Diamicton

Figure Title	Superficial Geology
Project Name	Ravengill Energy Park
Project No./Filery ID	1620017435 / REH2024N04129
Date	March 2026
Figure No.	8.7.3.2
Revision	1.0
Prepared By	AB
Scale	1:35,000 @A3
Client	**Ravengill Energy Park Limited**

1620017435-RAM-MA-IA-00026_Fig8.7.3.2SuperficialGeo_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Site Boundary

Site Layout

- Turbine Layout
- New Standard Track Centreline
- New Floating Track Centreline
- Upgraded Track Centreline
- Indicative Hardstanding Envelope
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area

Hydrology

- Watercourse Crossing
- Watercourse
- Waterbody

Aquifer Classification (BGS 625k)

- Highly Productive Aquifer
- Moderately Productive Aquifer
- Low Productivity Aquifer

Woodland

- Woodland (National Forest Inventory 2023)

Figure Title	Geomorphology & Hydrology
Project Name	Ravengill Energy Park
Project No./Filery ID	1620017435 / REH2024N04129

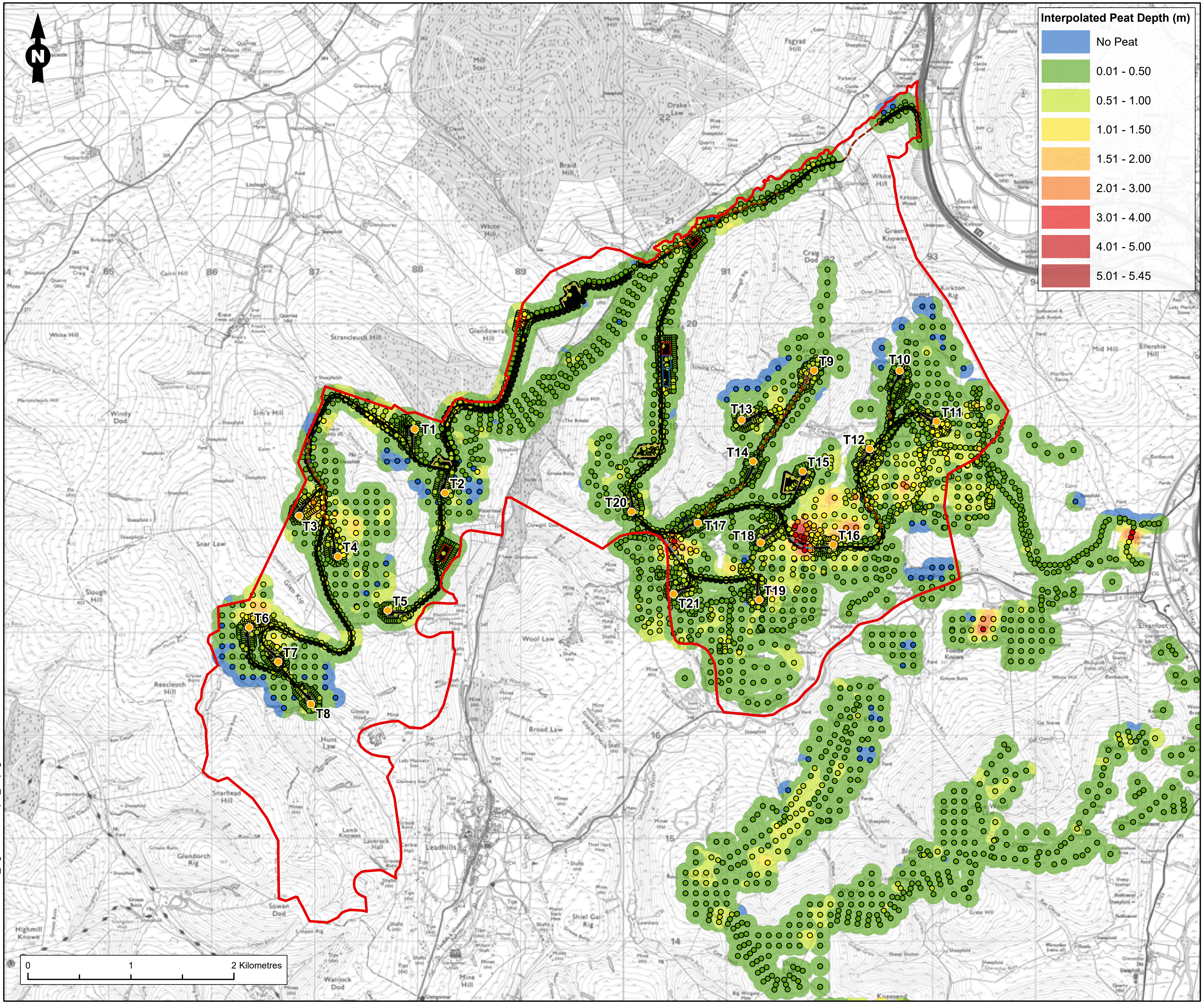
Date	Figure No.	Revision
March 2026	8.7.4	1.0

Prepared By	Scale
AB	1:35,000 @A3

Client
Ravengill Energy Park Limited

1620017435-RAM-MA-IA-00027_Fig8.7.4GeomorphHydro_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

Site Boundary

Site Layout

- Turbine Layout
- New Standard Track Centreline
- New Floating Track Centreline
- Upgraded Track Centreline
- Indicative Hardstanding Envelope
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area

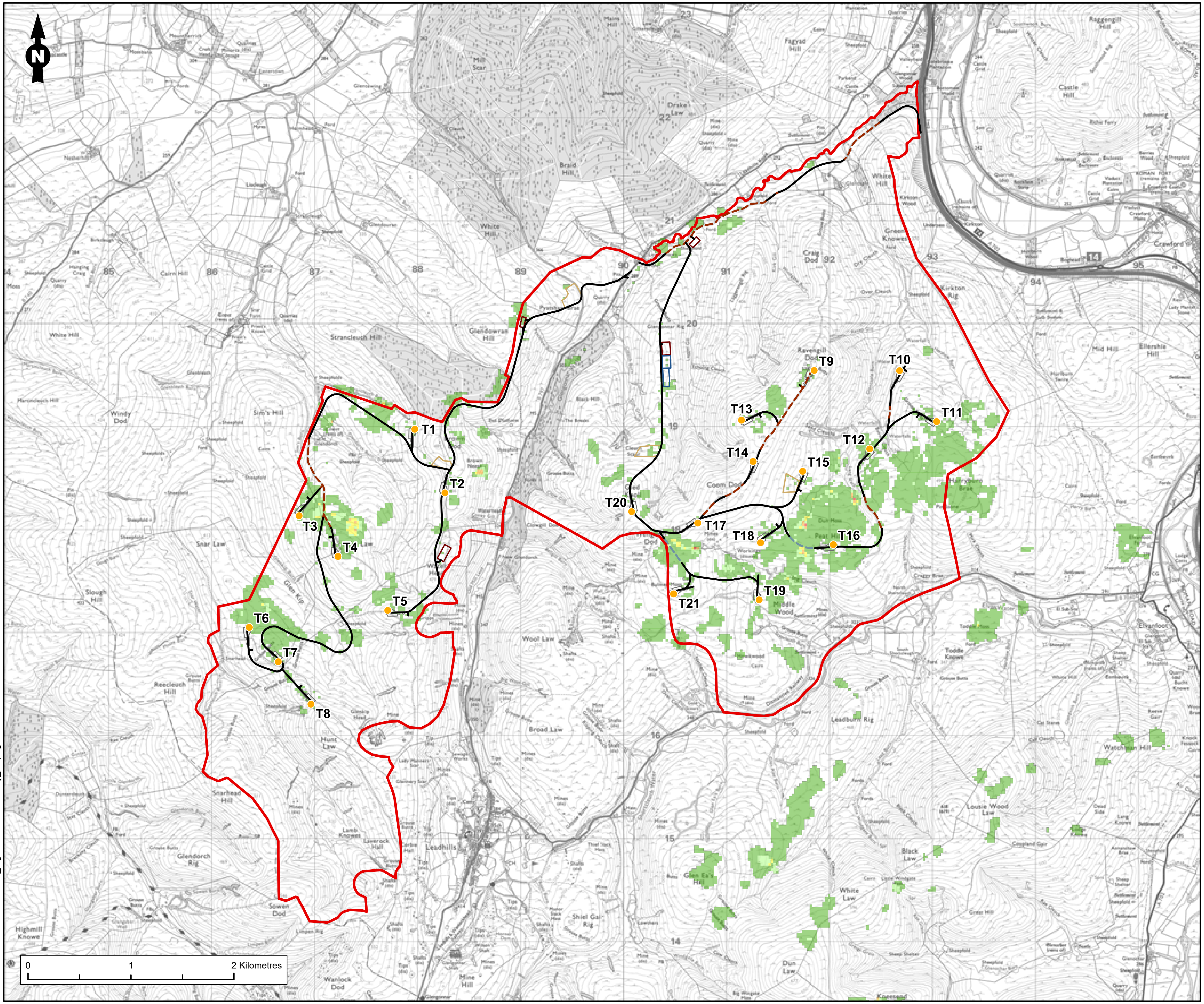
Peat Depth (m)

- No Peat
- 0.01 - 0.50
- 0.51 - 1.00
- 1.01 - 1.50
- 1.51 - 2.00
- 2.01 - 3.00
- 3.01 - 4.00
- 5.01 - 5.40

Figure Title Peat Depth		
Project Name Ravengill Energy Park		
Project No./Filery ID 1620017435 / REH2024N04129		
Date March 2026	Figure No. 8.7.5	Revision 1.0
Prepared By AB	Scale 1:35,000 @A3	
Client Ravengill Energy Park Limited		

1620017435-RAM-MA-IA-00028_Fig8.7.5PeatDepth_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

Site Boundary

Site Layout

Turbine Layout

New Standard Track Centreline

New Floating Track Centreline

Upgraded Track Centreline

Indicative Hardstanding Envelope

Indicative Substation and BESS

Indicative Construction Compound

Borrow Pit Search Area

Factor of Safety

< 1.0 (unstable)

1.0 - 1.4 (marginally unstable)

1.4 - 2.0 (stable)

2.0 - 3.0 (stable)

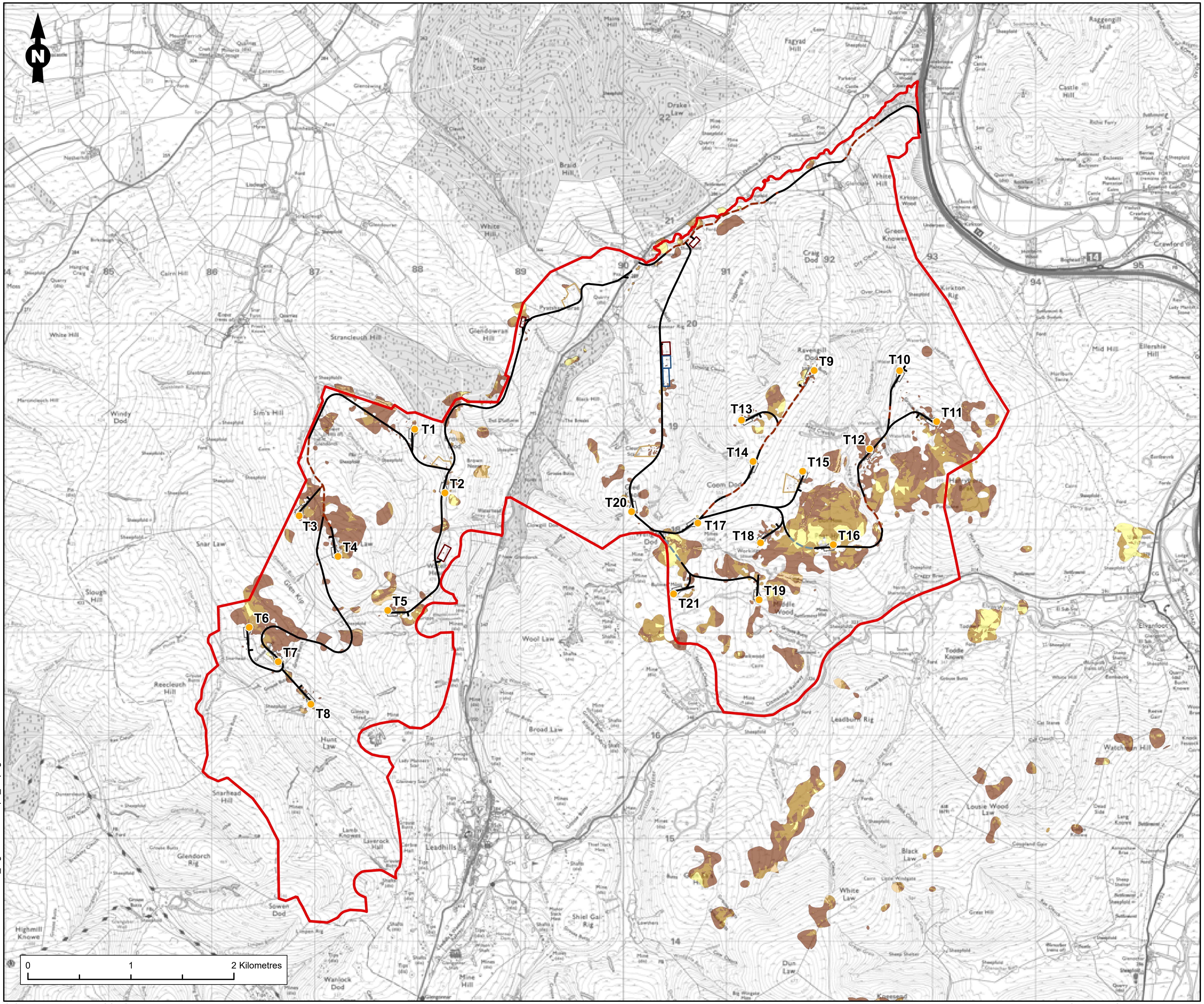
>3.0 (stable)

Figure Title: Factor of Safety		
Project Name: Ravengill Energy Park		
Project No./Filery ID: 1620017435 / REH2024N04129		
Date: March 2026	Figure No.: 8.7.6	Revision: 1.0
Prepared By: AB	Scale: 1:35,000 @A3	
Client: **Ravengill Energy Park Limited**		

RAMBOLL

1620017435-RAM-MA-IA-00029_Fig8.7.6FactorOfSafety_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

Site Boundary

Site Layout

- Turbine Layout
- New Standard Track Centreline
- New Floating Track Centreline
- Upgraded Track Centreline
- Indicative Hardstanding Envelope
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area

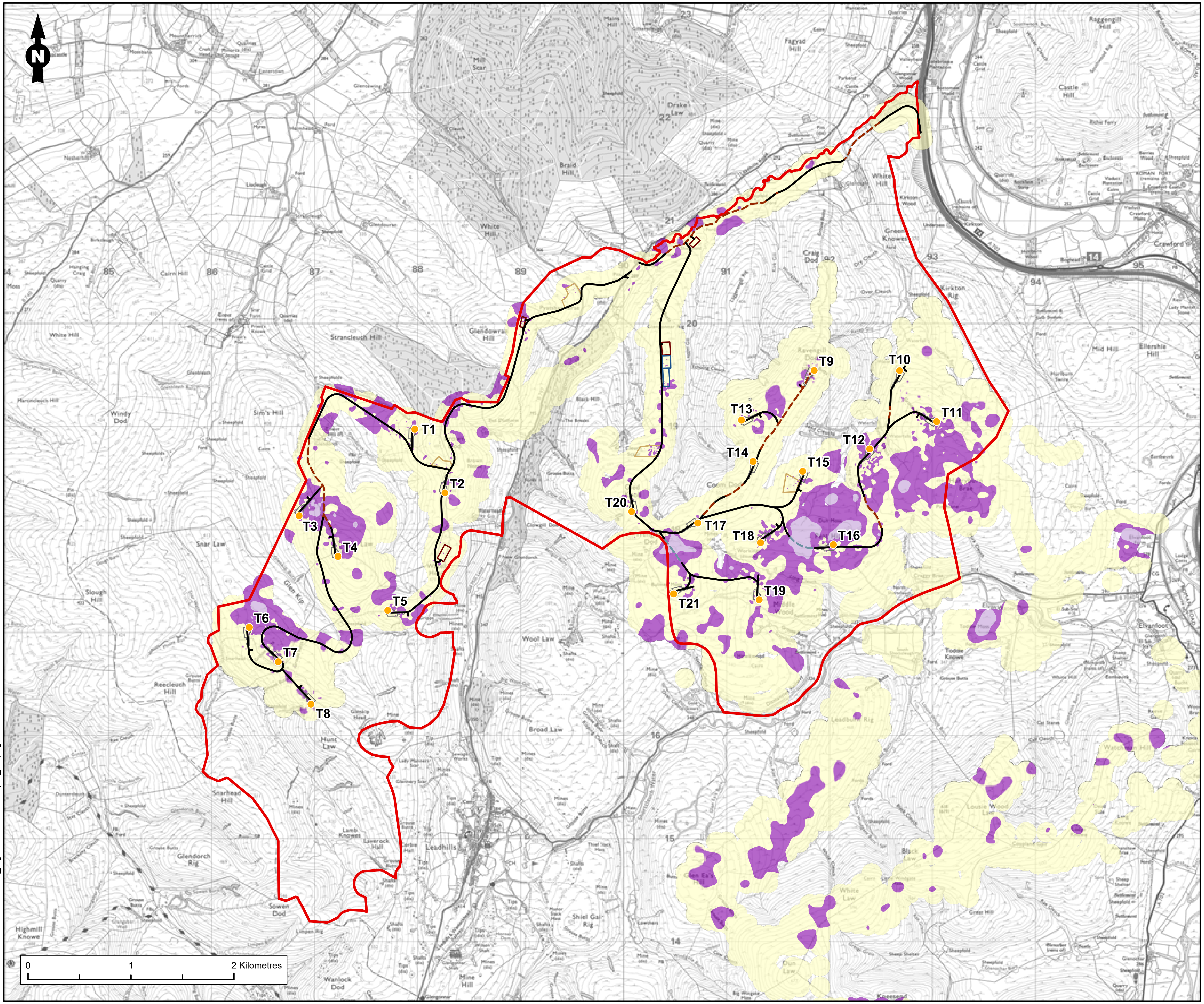
Slope Angle Scores (S)

- Score 0: <= 2 Deg
- Score 1: >20 Deg
- Score 2: 2 - 5 Deg and 15 - 20 Deg
- Score 3: 5 - 15 Deg

Figure Title	Contributing Factor: Slope Angle
Project Name	Ravengill Energy Park
Project No./Filery ID	1620017435 / REH2024N04129
Date	March 2026
Figure No.	8.7.7.1
Revision	1.0
Prepared By	AB
Scale	1:35,000 @A3
Client	**Ravengill Energy Park Limited**

1620017435-RAM-MA-IA-00030_Fig8.7.7.1CFSlope_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Site Boundary

Site Layout

- Turbine Layout
- New Standard Track Centreline
- New Floating Track Centreline
- Upgraded Track Centreline
- Indicative Hardstanding Envelope
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area

Peat Depth Scores (P)

- Score 1: < 0.5 m
- Score 2: >1.5 m
- Score 3: 0.5 - 1.5 m

Figure Title	Contributing Factor: Peat Depth
Project Name	Ravengill Energy Park
Project No./Filery ID	1620017435 / REH2024N04129

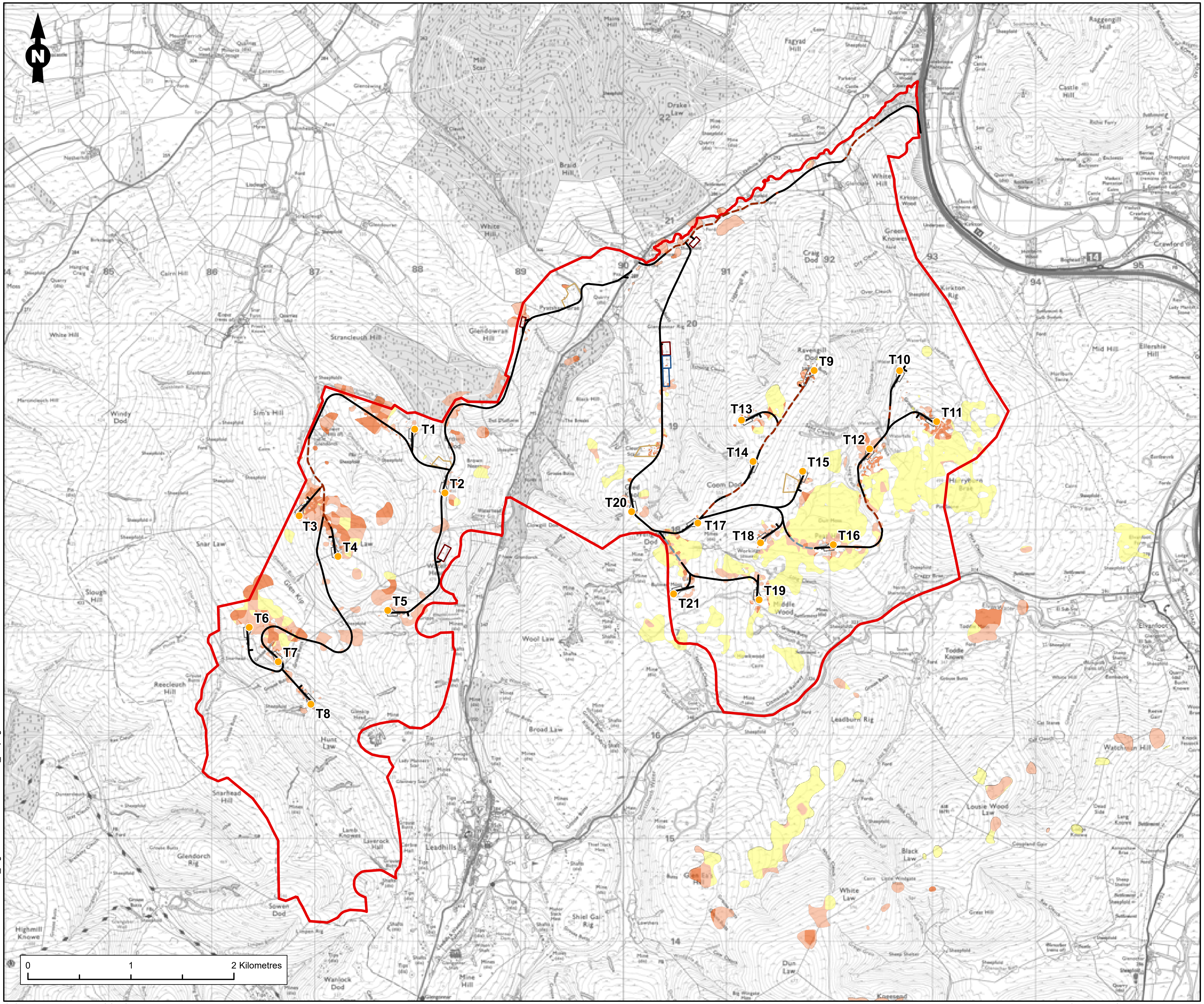
Date	Figure No.	Revision
March 2026	8.7.7.2	1.0

Prepared By	Scale
AB	1:35,000 @A3

Client
Ravengill Energy Park Limited

1620017435-RAM-MA-IA-00031_Fig8.7.7.2CFPeatDepth_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Site Boundary

Site Layout

- Turbine Layout
- New Standard Track Centreline
- New Floating Track Centreline
- Upgraded Track Centreline
- Indicative Hardstanding Envelope
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area

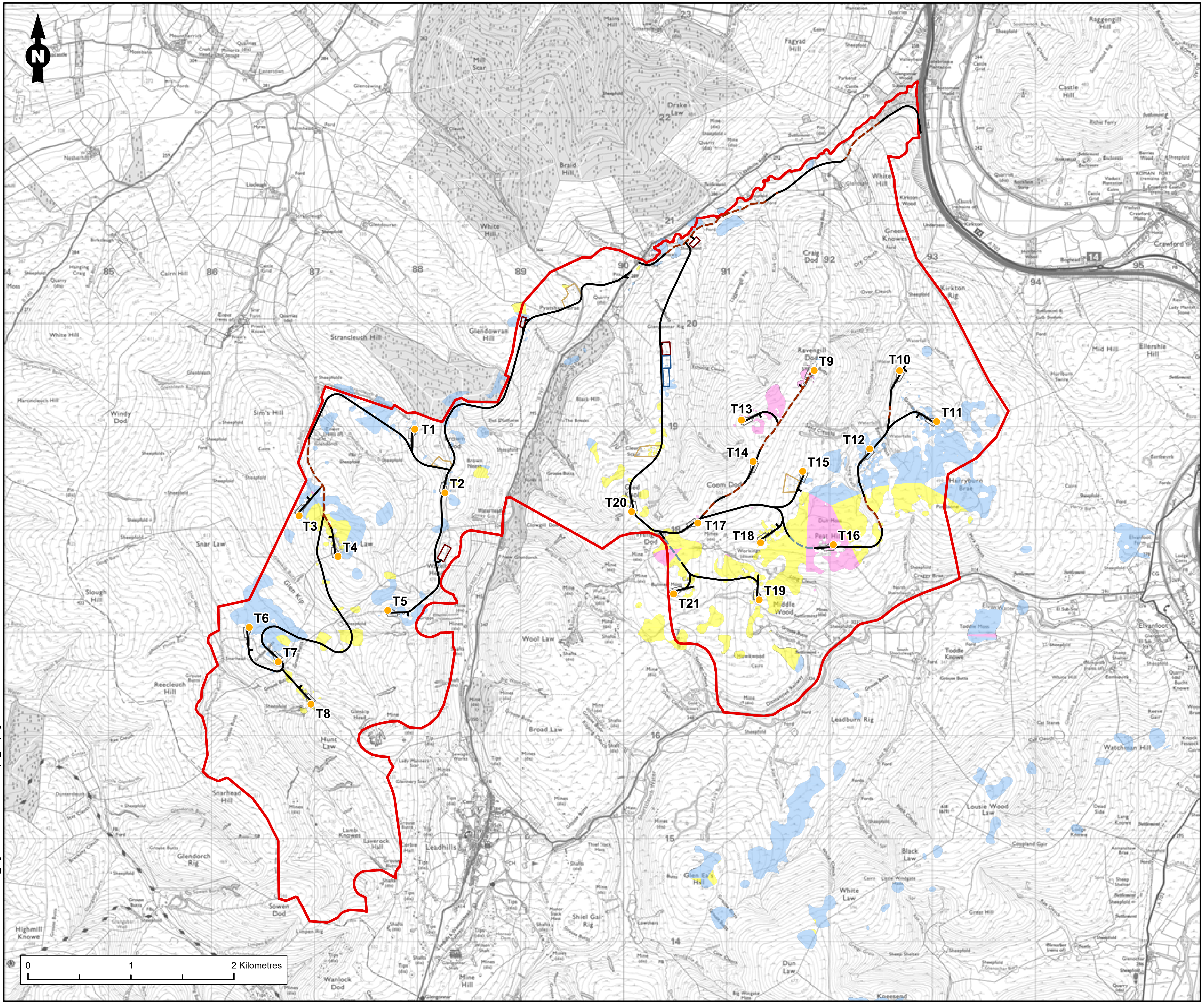
Substrate Geology Scores (G)

- Score 0: Permeable Bedrock
- Score 1: Impermeable Bedrock
- Score 2: Glacial Till

Figure Title		
Contributing Factor: Substrate Geology		
Project Name		
Ravengill Energy Park		
Project No./Filery ID		
1620017435 / REH2024N04129		
Date	Figure No.	Revision
March 2026	8.7.7.3	1.0
Prepared By	Scale	
AB	1:35,000 @A3	
Client		
Ravengill Energy Park Limited		

1620017435-RAM-MA-IA-00032_Fig8.7.7.3CFSubstrateGeo_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Site Boundary

Site Layout

- Turbine Layout
- New Standard Track Centreline
- New Floating Track Centreline
- Upgraded Track Centreline
- Indicative Hardstanding Envelope
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area

Peat Geomorphology Scores (M)

- Score 0: No Peat Geomorphology Features Noted
- Score 1: Existing Peat Slide/Hag/ Peat Cutting/Bare Ground
- Score 2: Flush/Diffuse Natural

Figure Title
Contributing Factor: Peat Geomorphology

Project Name
Ravengill Energy Park

Project No./Filery ID
1620017435 / REH2024N04129

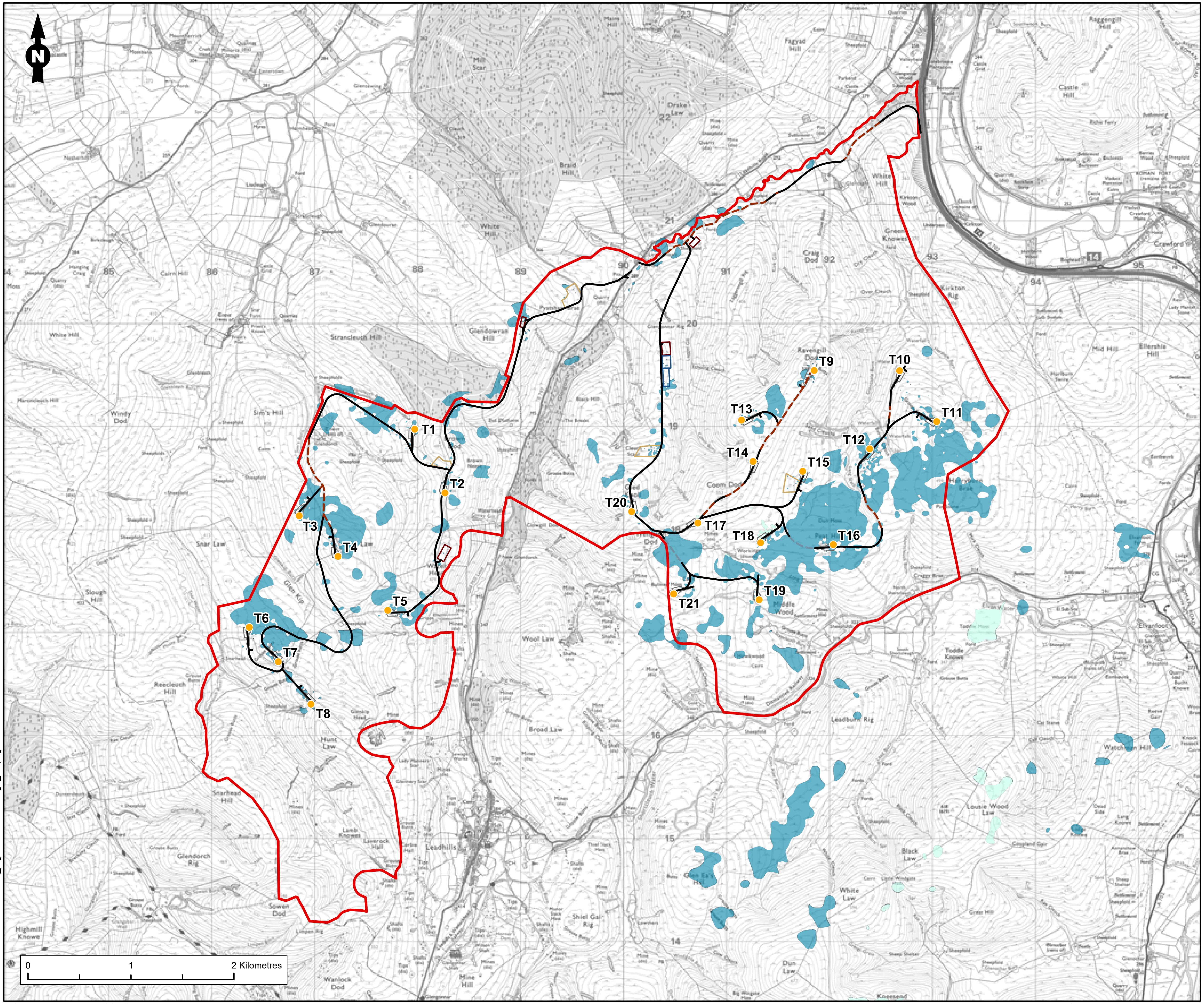
Date	Figure No.	Revision
March 2026	8.7.7.4	1.0

Prepared By	Scale
AB	1:35,000 @A3

Client
Ravengill Energy Park Limited

1620017435-RAM-MA-IA-00033_Fig8.7.7.4CFPeatGeomorph_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

Site Boundary

Site Layout

Turbine Layout

New Standard Track Centreline

New Floating Track Centreline

Upgraded Track Centreline

Indicative Hardstanding Envelope

Indicative Substation and BESS

Indicative Construction Compound

Borrow Pit Search Area

Drainage Scores (D)

Score 0: No Drainage Lines

Score 1: Drain Aligned to Slope

Figure Title	Contributing Factor: Drainage
Project Name	Ravengill Energy Park
Project No./Filery ID	1620017435 / REH2024N04129
Date	March 2026
Figure No.	8.7.7.5
Revision	1.0
Prepared By	AB
Scale	1:35,000 @A3
Client	Ravengill Energy Park Limited

RAMBOLL

1620017435-RAM-MA-IA-00034_Fig8.7.7.5CFDrainage_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

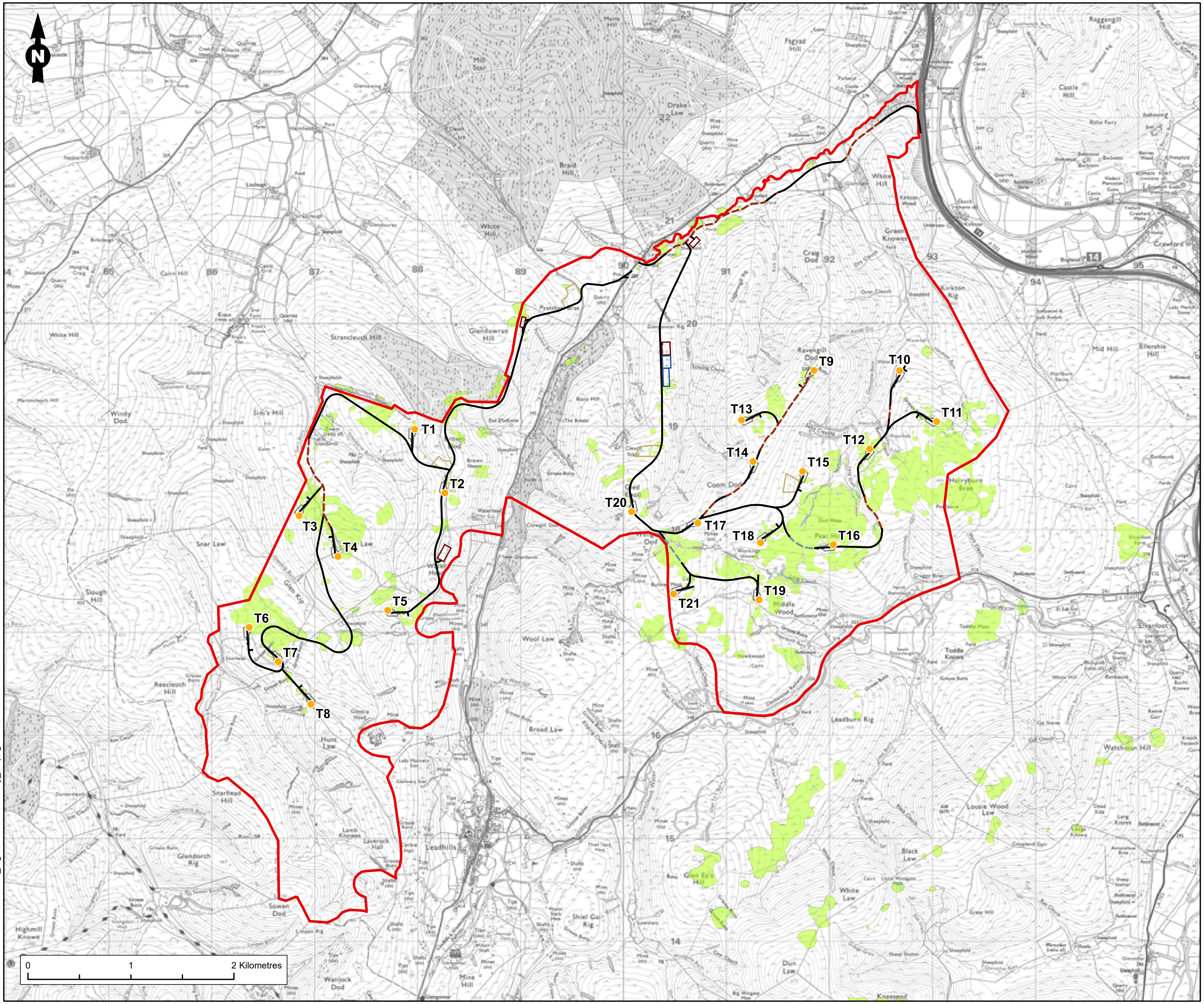


Figure Title
Contributing Factor: Convexity

Project Name
Ravengill Energy Park

Project No./Filery ID
1620017435 / REH2024N04129

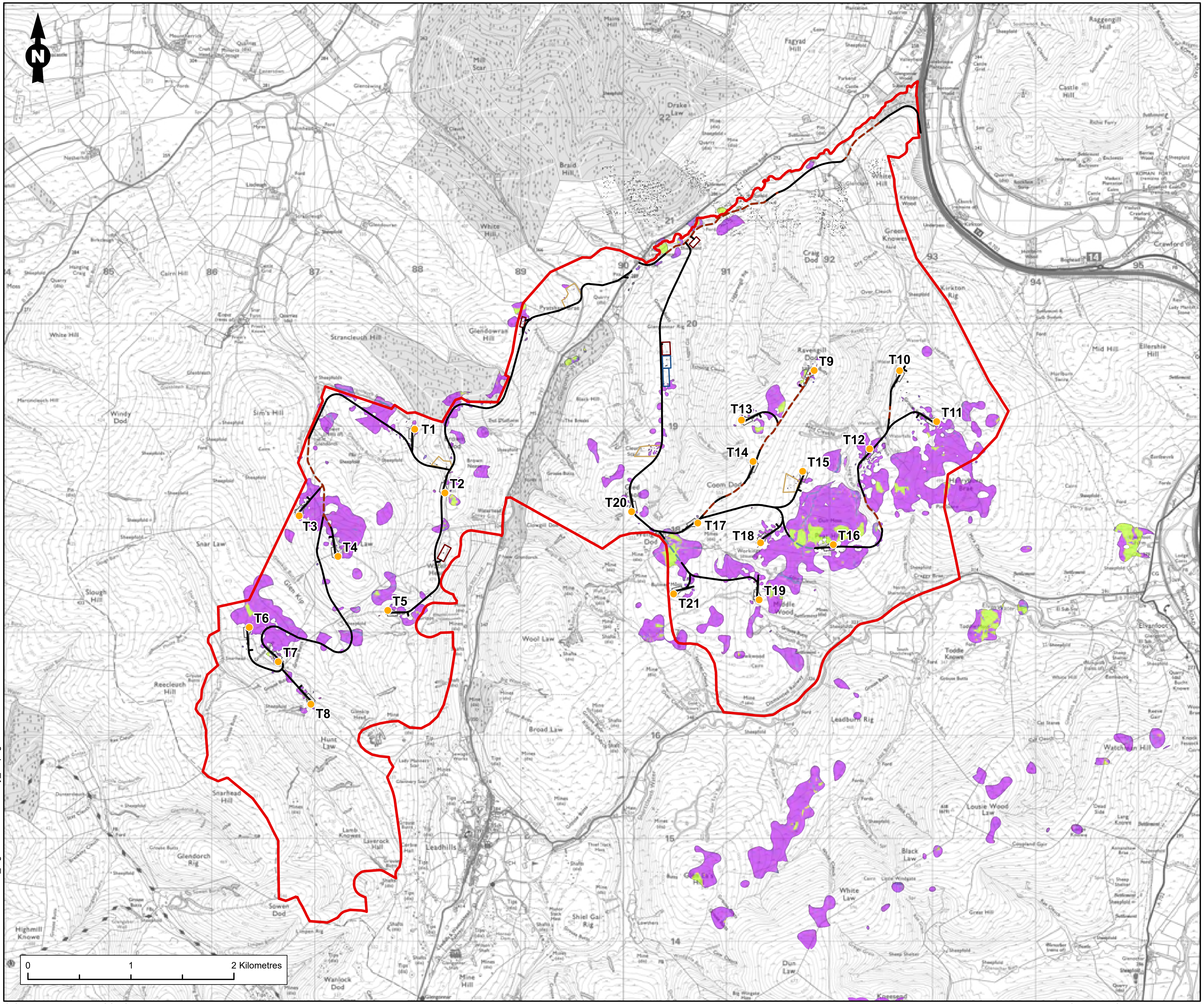
Date	Figure No.	Revision
March 2026	8.7.7.7	1.0

Prepared By	Scale
AB	1:35,000 @A3

Client
Ravengill Energy Park Limited

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

Site Boundary

Site Layout

- Turbine Layout
- New Standard Track Centreline
- New Floating Track Centreline
- Upgraded Track Centreline
- Indicative Hardstanding Envelope
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area

Profile Convexity Scores (C)

- Score 0: Undulating Ground Slope
- Score 1: Concave Slope
- Score 2: Convex Slope
- Score 3: Rectilinear Slope

Figure Title
Contributing Factor: Convexity

Project Name
Ravengill Energy Park

Project No./Filery ID
1620017435 / REH2024N04129

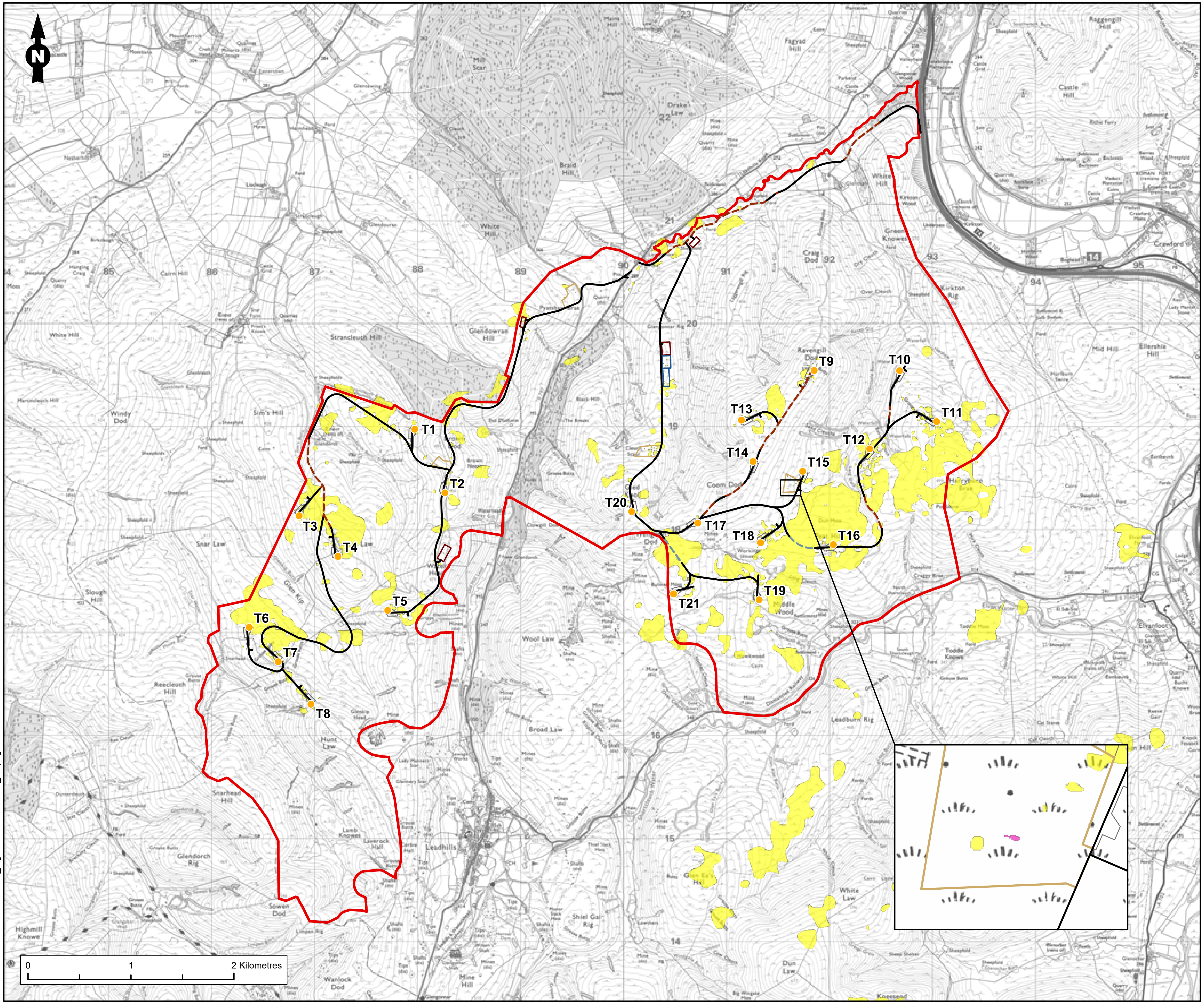
Date	Figure No.	Revision
May 2026	8.7.7.7	1.0

Prepared By	Scale
AB	1:35,000 @A3

Client
Ravengill Energy Park Limited

1620017435-RAM-MA-IA-00036_Fig8.7.7.7CFConvexity_04.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

Site Boundary

Site Layout

- Turbine Layout
- New Standard Track Centreline
- New Floating Track Centreline
- Upgraded Track Centreline
- Indicative Hardstanding Envelope
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area

Contributing Factor

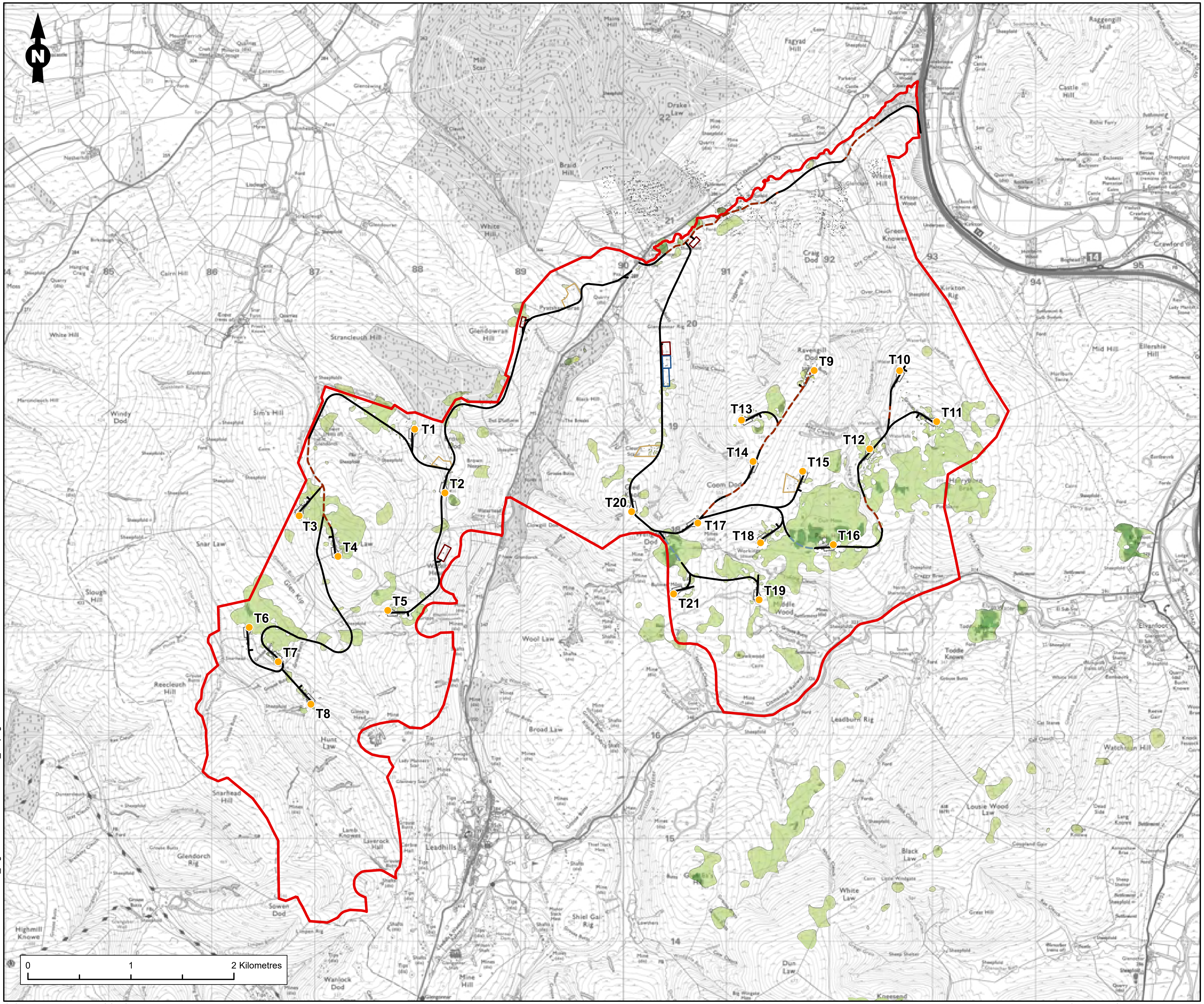
- Score 0: Other Land Use
- Score 3: Cutting/Turbary

Figure Title	Contributing Factor: Land Use
Project Name	Ravengill Energy Park
Project No./Filery ID	1620017435 / REH2024N04129
Date	March 2026
Figure No.	8.7.7.8
Revision	1.0
Prepared By	AB
Scale	1:35,000 @A3
Client	Ravengill Energy Park Limited

RAMBOLL

1620017435-RAM-MA-IA-00037_Fig8.7.7.8CFLanduse_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Site Boundary

Site Layout

- Turbine Layout
- New Standard Track Centreline
- New Floating Track Centreline
- Upgraded Track Centreline
- Indicative Hardstanding Envelope
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area

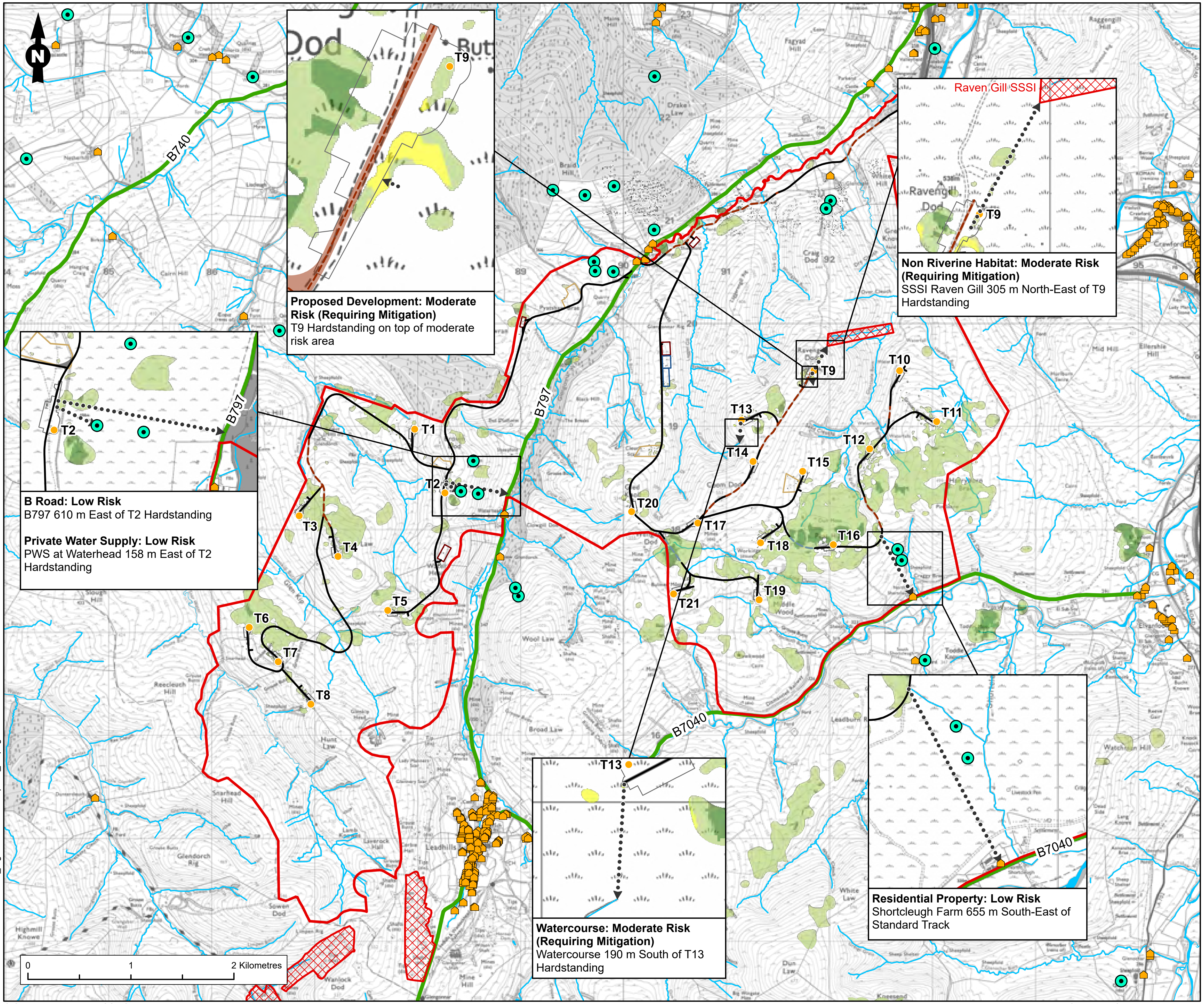
Peat Slide Likelihood

- 1) Very Low (< 8)
- 2) Low (8 - 13)
- 3) Moderate (14 - 18)

Figure Title: Peat Slide Likelihood		
Project Name: Ravengill Energy Park		
Project No./Filery ID: 1620017435 / REH2024N04129		
Date: May 2026	Figure No.: 8.7.8	Revision: 1.0
Prepared By: AB	Scale: 1:35,000 @A3	
Client: **Ravengill Energy Park Limited**		

1620017435-RAM-MA-IA-00038_Fig8.7.8PeatSlideLikelihood_04.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



1620017435-RAM-MA-IA-00039_Fig8.7.9DistToReceptors_03.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Site Boundary

Site Layout

- Turbine Layout
- New Standard Track Centreline
- New Floating Track Centreline
- Upgraded Track Centreline
- Indicative Hardstanding Envelope
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area

Peat Slide Likelihood

- Negligible
- Low
- Moderate

Receptors

- Residential Property
- Private Water Supply
- B Road
- Watercourse
- Waterbody
- Site of Special Scientific Interest (SSSI)

Figure Title
Distance to Receptors

Project Name
Ravengill Energy Park

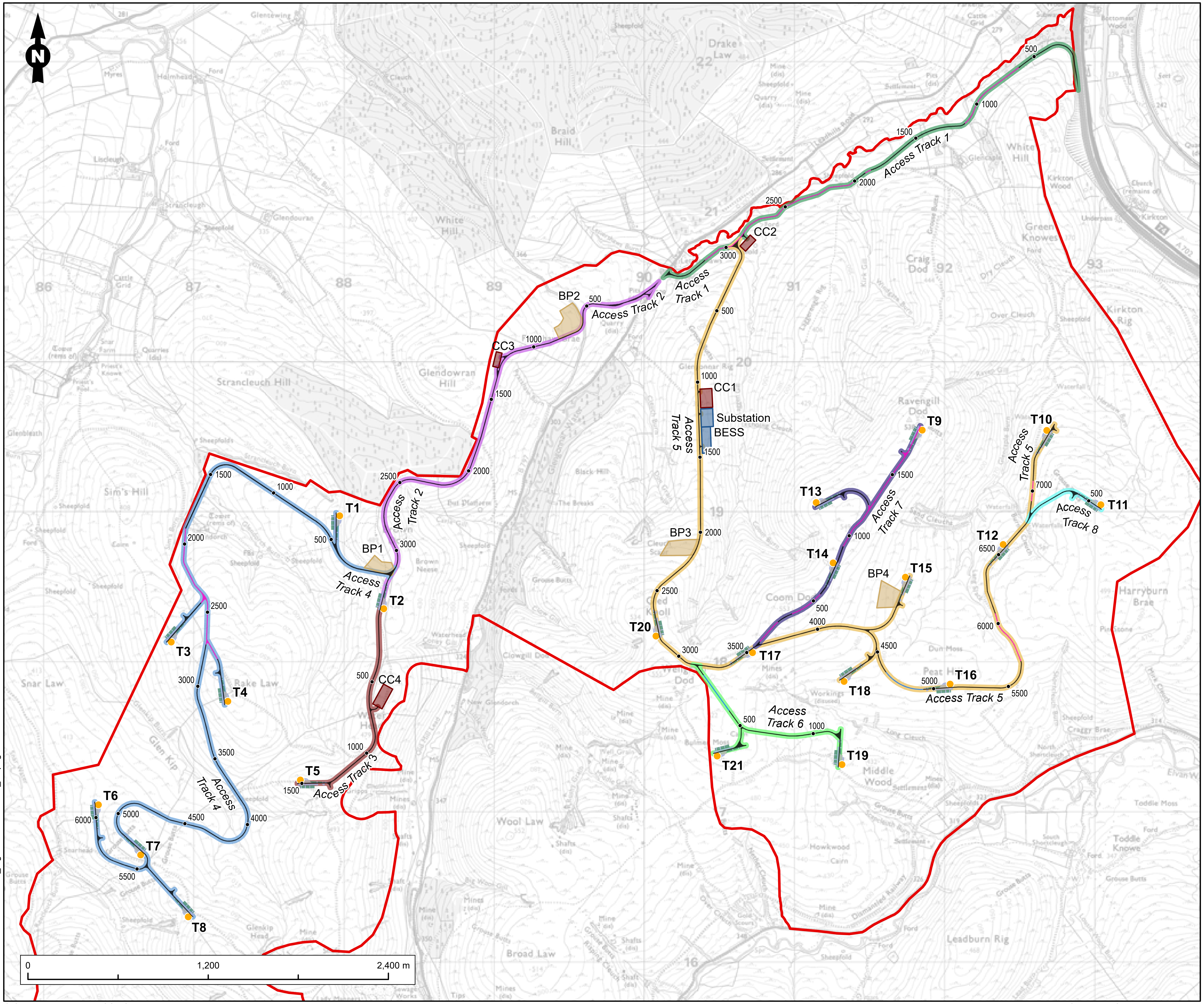
Project No./Filery ID
1620017435 / REH2024N04129

Date	Figure No.	Revision
May 2026	8.7.9	1.0

Prepared By	Scale
AB	1:35,000 @A3

Client
Ravengill Energy Park Limited

RAMBOLL



Legend

- Site Boundary
- Chainage Point

Site Layout

- Turbine Layout
- New Standard Track Extents
- New Floating Track Extents (Temp)
- Upgraded Track Extents
- Turbine Hardstand (Permanent)
- Turbine Hardstand (Temporary)
- Turbine Hardstand (Clearance)
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area

Track Segments

- Access Track 1
- Access Track 2
- Access Track 3
- Access Track 4
- Access Track 5
- Access Track 6
- Access Track 7
- Access Track 8

Figure Title
Track Segments: Overview

Project Name
Ravengill Energy Park

Project No./Filery ID
1620017435 / REH2024N04129

Date	Figure No.	Revision
March 2026	8.7.10	1.0

Prepared By	Scale
AB	1:24,000 @A3

Client
Ravengill Energy Park Limited

1620017435-RAM-MA-IA-00040_Fig8.7.10PeatTracks_03.pgxz

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.