4.0 Fieldwork

4.1 Peat Surveys

Peat surveys were carried out in accordance with best practice guidance for developments on peatland[18,19]. Phase 1 peat probing was conducted on a 100m grid to allow for initial assessment of the site which was used in preliminary site layout designs. Phase 2 probing saw detailed probing undertaken across the site, focussing on access tracks, turbines, hardstandings and other site infrastructure. Phase 2 probing was typically undertaken on linear infrastructure (permanent / temporary tracks) at 25m to 50m spacings with offset probing locations either side (approximately 10m to 25m). Infrastructure (turbines, hardstandings, compounds, etc.) was typically probed at 10m grid spacings.

Where surveys were undertaken by SLR, the thickness of the peat was assessed using a graduated peat probe, approximately 6mm diameter and capable of probing depths of up to 10m. This was pushed vertically into the peat to refusal and the depth recorded, together with a unique location number and the co-ordinates from a handheld Global Positioning System instrument (GPS). The accuracy of the GPS was quoted as ±2m, which was considered sufficiently accurate for this survey. All data was uploaded into a GIS database for incorporation into various drawings and analysis assessments.

Where the peat probing met refusal on a hard substrate, the 'feel' of the refusal can provide an insight into the nature of the substrate. The following criteria were used to assess material:

- Solid and abrupt refusal – rock;
- Solid but less abrupt refusal with grinding or crunching sound – sand or gravel or weathered rock;
- Rapid and firm refusal – clay; or
- Gradual refusal – dense peat or soft clay.

The relative stiffness of the peat was also assessed from the resistance to penetration of the probe and to the effort required to extract the probes (retrieval of the probe was often impossible for one person). In all instances refusal was met on obstructions allowing identification of subsurface geology.

4.2 Peat Depth

Peat is generally defined as a soil with a surface organic layer in excess of 0.5m[18]. Where the probing recorded less than 0.5m thick, it is considered to be a peaty soil (or organo-mineral soil). Soils with a peaty organic horizon over mineral soil are often referred to as 'peaty soils'. These organo-mineral soils are extensive across the UK uplands, but do not meet recognised definitions of peat as they are either shallower than true peat or have a lower carbon density.

A total of 7,299 peat probes were undertaken across all survey phases with all probing data provided as **Annex A**. **Table 4-1** summarises the peat probing results below. The average thickness of peat recorded across the proposed development was 0.7m and the maximum depth of recorded peat was 4.0mbgl.

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

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

Table 4-1: Peat Probing Results

Peat Thickness (m)	No. of Probes	Percentage (of total probes undertaken on-site)
0 (no peat)	32	0.4
0.01 – 0.49 (peaty soil)	3,490	47.8
0.50 – 0.99	1,679	23.0
1.00 – 1.49	1,019	14.0
1.50 – 1.99	640	8.8
2.00 – 2.49	318	4.4
2.50 – 2.99	89	1.2
3.00 – 3.49	26	0.4
3.50 – 3.99	5	0.1
> 4.0	1	0.0

4.3 Peat Condition

Peat is described using BS5930[20] and the Von Post classification[21]. Six peat cores and samples were collected by SLR during Phase 2, using a peat auger and used to inform interpretations of the underlying physical peat condition and underlying substrate. Peat samples were undertaken to depths of between 1.0 and 2.8 mbgl. The peat cores recorded fibrous to pseudo-fibrous condition.

Table 4-2: Peat Coring Results

Location	Depth (mbgl)	Von Post Degree of Decomposition	Description
PC01:	GL-1.20 1.20-2.50	H2, B2 H4, B2	Dark brown fibrous PEAT, with frequent plant remains. Dark brown pseudo-fibrous PEAT with occasional plant remains
PC02:	GL-0.70 0.70-1.90	H2, B2 H4, B3	Dark brown fibrous PEAT, with frequent plant remains. Dark brown pseudo-fibrous PEAT with occasional plant remains
PC03:	GL-0.50 0.50-2.50	H2, B2 H4, B2	Dark brown fibrous PEAT, with frequent plant remains. Dark brown pseudo-fibrous PEAT with occasional plant remains
PC04:	GL-0.50 0.50-1.00	H2, B2 H3, B2	Brown fibrous PEAT, with frequent plant remains. Dark brown fibrous PEAT with occasional plant remains
PC05:	GL-0.50 0.50-2.75 2.75-2.80	H2, B2 H4, B2	Dark brown fibrous PEAT, with frequent plant remains. Dark brown pseudo-fibrous PEAT with occasional plant remains

[20] BS 5930:2015+A1:2020, Code of practice for ground investigations

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

Location	Depth (mbgl)	Von Post Degree of Decomposition	Description
			Grey sandy GRAVEL
PC06:	GL-0.70 0.70-1.50	H2, B2 H4, B2	Dark brown fibrous PEAT, with frequent plant remains. Dark brown pseudo-fibrous PEAT with occasional plant remains

Peat core logs and photographs are presented within **Annex B**.

4.4 Substrate

Where possible, in the SLR investigation, an assessment of the substrate was made, as described previously. From the evidence of the probing and coring, the substrate was recorded as the following:

- Granular, recorded at 7,079 (97%) probe locations; and
- Rock, recorded at 220 (3%) probe locations.

5.0 Hazard and Risk Assessment

5.1 Introduction

The Scottish Government Guidance[1] provides an overview of the principles of hazard and risk with respect to peat landslides. The guidance is noted as illustrative only and the developers can present their own methodology, providing it is clearly explained and incorporates consideration of the likelihood of instability and the consequences should it occur. The following sections detail the preferred methodology used within this assessment.

A 'Hazard Ranking' system has been applied based on the analysis of risk of peat slide as outlined in the Scottish Government Guidance[1]. This is applied on the principle:

Hazard Ranking = Hazard x Exposure

This philosophy can be applied to the assessment carried out so far in the following approach:

Hazard Ranking = Risk Rating x Impact Rating

5.2 Methodology

The determination of Risk Rating and Impact Rating values is based on a number of variables which impact the likelihood of a peat slide and the relative importance of these variables specific to the proposed development.

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

In the absence of a predefined system, the approach to determining and categorising Risk Rating and Impact Rating is determined on a site-by-site basis. The particular system adopted for the PLHRA is outlined in the following sections.

5.3 Slope Stability

The stability of peat is a complex subject and there are numerous inter-relationships that affect the stability.

A quantitative assessment requires a numerical input and such an analysis cannot account for the unquantifiable input required for a comprehensive peat stability assessment. For this reason, a purely quantitative assessment should only be considered as a guide and a qualitative assessment of stability should be used to inform the final recommendations.

The characteristics of the peat failure phenomena have been incorporated in a stability risk assessment to evaluate the risk of instability occurring within the peat areas. The main factors controlling the stability of the peat mass are the surface gradients, the depth and condition of the peat at each location and the type of substrate.

The natural moisture content and undrained shear strength of the peat are important; however, it is generally accepted that where present, the peat would be saturated and have a very low strength. It is believed to be unrealistic to rely on specific values of shear strength to maintain stability when back analysis of failed slopes indicates that there is often a significant discrepancy between measured strength in peat and stability. Shear strength has been assumed to be constant and worst case, throughout this assessment. It has also been assumed, as a worst case, that the groundwater level is coincident with the ground surface.

5.4 Risk Rating

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

- Peat depth;
- Slope gradient;
- Substrate material; and
- Evidence of instability or potential instability;

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

The rating system outlined below differs slightly from that proposed in the Scottish Government Guidance[1] as the system adopted here incorporates three inputs compared to two in the guidance, with the potential impact of substrate added in this section.

The probability of a peat landslide 'Risk Rating' (score) was derived by multiplying the coefficients for the four key factors (with historic instability as one factor) together to produce a risk rating which is a measure of the likelihood of peat instability, and this enables potential areas of concern to be highlighted. For the assessment, the following rating system was applied as shown in **Table 5-1**.

Table 5-1: Probability of Peat Landslide

Risk Rating Coefficient	Potential Stability Risk (Pre-Mitigation)	Action
<5	Negligible	No mitigation action required.
5 - <16	Low	As for negligible condition plus development of a site-specific construction and management plan for peat areas.
16 - <31	Medium	As for Low condition plus may require mitigation to improve site conditions.
31-50	High	Unacceptable level of risk, the area should be avoided. If unavoidable, detailed investigation and quantitative assessment required to determine stability and sensitivity to minor changes in strength and groundwater regime combined with long term monitoring.
>51	Very High	Unacceptable level of risk, the area should be avoided.

5.4.1 Peat Depth

The peat depth is shown on the peat depth interpolation Figures provided in **Figure 10.1.6** and **Figure 10.1.7**. The interpolation was undertaken using the Spline with Barriers tool in ArcGIS Pro) methodology.

Table 5-2 shows the peat depth ranges and their related peat depth coefficients. The ground conditions were assessed by using peat depths recorded during peat probing. Thin peat was classed as being 0.5 to 1.5m thick, with deposits in excess of this being classed as thick. The thickness ranges used are intended to reflect the risk of instability associated with both peat slides (in thin peat) and bog slides. Where the probing recorded peat less than 0.5m thick, this has been considered to be an organic soil rather than peat and are outside the scope of this assessment.

In addition to peat thickness, the presence of existing landslip debris or indicators of meta-stable conditions such as tension cracks or slumping in the peat suggest the material is likely to become even less stable should the existing ground conditions change. Where evidence of historical slips, collapses, creep or flows is seen, a separate coefficient has been applied.

Table 5-2: Coefficients for Peat Depth

Peat Depth Range	Description	Peat Depth Coefficients
(<0.5 m)	Peaty/organic soil	0
(0.5 – 1.5 m)	Thin Peat	2
(>1.5 m)	Thick Peat	3*
-	Slips /collapses / creep / flows	8

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

5.4.2 Slope Gradients

Table 5-3 gives the coefficients applied to the categorised slope angles. The slope gradients were assessed by reference to the mapping and particularly the Digital Terrain Model (DTM) which was used to generate a slope map (**Figure 10.1.8**), from which the gradient at each probe location could be determined and input into the risk rating spread sheet (**Annex A**). The gradient quoted at each location was based on the average gradient over a 5m grid.

Coefficients for slope gradient have been assigned to ensure the potential for both peat slides (gradients of 4-15°) and bog slides (gradients of 2-10°) are addressed. By simple inspection it is clear that steeper slopes pose a greater risk of instability than shallow gradients. Therefore, a graduated gradient scale from 0° to >12° (the practical maximum gradient on which peat is commonly observed) has been applied.

Table 5-3: Coefficients for Slope Gradients

Slope Angle (°)	Slope Angle Coefficients
Slope <2°	1
2°≤ Slope <4°	2
4°≤ Slope <8°	4
8°≤ Slope <12°	6
>12° Slope	8

5.4.3 Substrate

Table 5-4 shows the substrate type and their related substate coefficient. As noted above, most failures in thin peat layers occur at the interface with the underlying substrate; the nature of the substrate has an influence on the probable level of stability.

Peat failures often occur within glacial till deposits in which an iron pan is observed in the upper few centimetres (Dykes and Warburton, 2007)[22]. They have also been observed over glacial till without and obvious iron pan, or over impermeable bedrock. They are rarely cited over permeable bedrock as the formation of peat deposits is deemed to be less likely.

[22] Dykes A and Warburton J (2007) Mass movements in peat: A formal classification scheme. Geomorphology 86, pp. 73–93

Where sand and/or gravel (derived from glacial till) form the substrate, the effective strength of the interface can be considered to be good with comparatively high friction values. Under these conditions, failure is likely to occur in a zone within the peat, just above the interface. Further factors are necessary to cause a failure of this nature (increased pore pressures within the peat) and occurrence of such events is rare.

A rock substrate provides a high strength stratum, however, the rock surface can be smooth, and, depending on the dip orientation of the strata, it can provide a very weak interface. Therefore, it has been given a rating higher than that of granular material.

Where clay forms the interface, there is likely to be a significant zone of softening in the clay (due to saturation at low normal stresses, poor or non-existent vertical drainage and the effect of organic acids), resulting in either very low undrained shear strength or low effective shear strength parameters. The result is that potential shearing could occur either in the peat, on the interface or in the clay; all three possibilities have been documented in the past.

Table 5-4: Coefficients for Substrate

Substrate Conditions	Substrate Coefficients
Granular	1
Rock	2
Cohesive	3
Not proven	3
Slip material (Existing materials)	5

Probing across the site indicated primarily granular and bedrock substrates using the refusal method. This was confirmed by coring at selected locations at proposed infrastructure.

5.4.4 Results

The table of results, included in **Annex A**, shows that 7,299 probe locations were identified within the extent of the DTM, peat (>0.5 m) was present at 3,777 locations. The stability risk rating identified the following:

- No peat was recorded at 32 (<1%) probe locations, hence no risk;
- Negligible risk at 3,952 (54%) probe locations;
- Low risk at 2,779 (38%) probe locations;
- Medium risk at 525 (7%) probe locations; and
- High risk at 11 (<1%) probe locations.

Figure 10.1.9 presents the interpreted risk of peat instability based on the multiplication of the risk coefficients discussed above in **Table 5-2** to **Table 5-4**.

5.5 Impact Rating

An assessment of the receptors ‘Impact Rating’ of the medium risk locations has been undertaken. It should be noted that the impact assessment is primarily concerned with impacts that affect the environment, ecology, public or infrastructure associated with the proposed development, both onsite and potentially offsite. This assessment does not consider the detailed ecological impact of construction induced peat instability; however, the majority of the sensitive on-site receptors are the watercourses and thus the inferred ecological and environmental issues are addressed. The proposed mitigation measures in Section 6.0 would limit the potential for any slope failures into watercourses and drainage features hence limit

such impacts. The effect a slope failure may have on the construction site and infrastructure can be easily identified. However, the effect of an instability event on features impacted by an event not associated with the proposed development is harder to predict. In order to address this effect, it is not considered appropriate to assess the effect at every potential receptor location close to the proposed development; but rather to assess the effect a particular infrastructure feature (track, wind turbine, substation, etc.) would have on the structures or features surrounding it. By adopting such an approach, the assessment of infrastructure features where a risk ranking of 'negligible' or 'low' (assessed in the stability risk assessments described above) is discounted from further assessment.

The impact rating coefficient (score) is derived by multiplying the receptor ranking coefficient (score) by the distance coefficient (score) and the elevation coefficient (score) for each impact receptor associated with a particular infrastructure feature. The ranking process by attributing the different weighting systems to each factor is detailed in the following sub-sections.

5.5.1 Receptor Ranking

Receptors are generally nearby structures or features that may be affected by peat movements caused during or following construction. Generally, only receptors immediately down gradient of the infrastructure feature could be affected by peat instability, therefore the first phase of feature ranking requires topographic ridges and valleys to be identified across the proposed development and surrounding area. From this, receptors at risk from particular infrastructure features can be identified. However, should instability occur on a steep slope, there is the risk of the back scarp of the instability migrating up-slope, there-by affecting areas previously considered not to be at risk.

The main receptors located across the site and surrounding area which could potentially be affected in the event of a peat slide; were primarily watercourses and associated tributaries (as shown in **Table 6-1** and **Figure 10.1.9**). No GWDTE or PWS have been identified as possible receptors of any potential peat instability across the proposed development.

Following identification of receptors at risk, these are ranked according to their size and sensitivity**. Table 5-5** presents the coefficients placed on particular receptor types.

Table 5-5: Coefficients for Receptor Ranking

Nature of Feature	Feature Coefficient
Non-critical Infrastructure (including minor/private roads, estate tracks)	1
Proposed Development Infrastructure (including tracks, compounds, etc.,)	3
Sensitive Hydrological Feature (including watercourses, tributaries, GWDTE, PWS, etc.,)	3
Sub-Community (settlement 1-10 residents)	6
Community (settlement of >10 residents)	8

5.5.2 Receptor Proximity

The proximity of an impact receptor is also critical in assessing the likely level of disruption it may suffer following an instability event. Based on this, two further coefficients – distance from infrastructure feature and relative elevation differences between the infrastructure feature and

impact receptor - are applied in deriving an impact ranking. **Table 5-6** and **Table 5-7** present the coefficients derived for distance and elevation of impact receptors.

Table 5-6: Coefficient for Receptor Proximity

Distance from Coefficient Feature	Distance Coefficient
> 1 km	1
100 m – <1 km	2
10 – <100 m	3
0 – <10 m	4

Table 5-7: Coefficient for Impact Feature Elevation

Relative Elevation of Feature	Elevation Coefficient
0 -<10 m	1
10 – <50 m	2
50 – <100 m	3
> 100 m	4

Based on distance to impact receptors, in this instance we have identified watercourses (which are the most sensitive receptor near the proposed development). The other receptors have been discounted, either they are not present or distance to receptor mitigates risk. Watercourses are the principal receptor as they are at risk of not only direct impact from a peat slide but potentially the water course creates a pathway to impact other receptors indirectly, either ecological or potential water users downstream. Based on **Table 5-7** the watercourses would have an impact receptor coefficient (score) of 3 and then considering the distance to the receptor and the relative elevation differences on-site of receptors, a potential impact can be derived.

5.6 Hazard Ranking

In order to achieve a meaningful and manageable result from the hazard ranking, the results of the Risk Rating and Impact Rating have been normalised to a standard numerical scale (below).

Table 5-8: Rating Normalisation

Risk Rating		Impact Rating	
Current Scale	Normalised Scale	Current Scale	Normalised Scale
Negligible <5	1	Very Low <10	1
Low 5 - <16	2	Low 11 - 20	2
Medium 16 – <31	3	High 21 - 30	3
High 31 - 50	4	Very High 31-50	4
Very High >51	5	Extremely High >51	5

The method of assessing probability of landslide, adverse consequence and hazard developed by SLR Consulting incorporates additional critical elements such as the substrate interface and coefficients for the receptor position, distance and elevation and as such is considered to be more rigorous than the assessment scheme proposed by the Scottish

Government[1]. The Hazard Ranking scale does equate to the Scottish Government[1] scale, with rankings divided over four zones.

A simple multiplication of these coefficients would result in potentially large and unwieldy risk and impact rating numbers. SLR has therefore opted to normalise these values to bring them in line with the values used in the Scottish Government Guidance[1], as illustrated in **Table 5-8**.

Table 5-9: Hazard Ranking

Hazard Ranking	Hazard Ranking Zone	Action
1-4	Insignificant	No mitigation action required although slide management and monitoring shall be employed. Slide management shall include the development of a site specific construction plan for peat areas.
5 - 10	Significant	As for Insignificant condition plus further investigation to refine the assessment combined with detailed quantitative risk assessment to determine appropriate mitigation through relocation or re-design.
11 - 16	Substantial	Consideration of avoiding project development in these areas should be made unless hazard mitigation can be put in place without significant environmental effect.
17-25	Serious	Unacceptable level of hazard; development within the area should be avoided.

The stability risk assessment has demonstrated that the majority of the site lies within an area of negligible to low risk (93% of probe locations) with regards to stability based on **Figure 10.1.9**.

7% of probe locations identified a medium or high risk of peat instability across the proposed development. Following review, the majority of these locations are not considered to have either a potential impact on the development infrastructure, due to locality, either well away from influencing infrastructure, in a down gradient position or have no impact on the local watercourses (receptors). Therefore, 39 medium risk sites have been identified and are discussed in the following section.

The stability risk assessment results presented in **Table 6-1** shows the calculated hazard ranking associated with every location where there is a stability risk of medium or above, at or close to infrastructure. The particular mitigation measures to reduce the risk of instability occurring are dependent upon location and the type of proposed structure. Proposed mitigation measures and actions already undertaken to reduce the risk of peat instability occurring are also identified in **Table 6-1**, together with the associated, revised hazard ranking. A more detailed discussion of the possible mitigation measures is presented in Section 6.0.

6.0 Slide Risk and Mitigation

6.1 Overview

A number of mitigation measure can be implemented to further reduce the risk levels identified across the site. These range from infrastructure specific measures to general good practice that should be applied across the proposed development to increase awareness of peat instability and enable early identification of potential displacement and opportunities for mitigation.

Risks may be mitigated by:

- Undertaking site specific stability analysis using better quality geotechnical data, final design loads for infrastructure and detailed ground models in areas of specific concern.
- Precautionary construction measures – including use of monitoring, good practice and a geotechnical risk register relevant to all locations.

Mitigation measures are provided below specific to each area of “Medium” or “High” risk. These mitigation measures will also help further reduce “Low” and “Negligible” risks to potential receptors. Section 6.2 provides information on good practice pre-construction, during construction and post-construction (i.e. during operation).

6.2 Embedded Mitigation

The paragraphs below detail good practice that is recommended during construction and follow the principles detailed in the NatureScot Guidance (2024)[3]. These measures are considered 'embedded mitigation' for the purposes of the assessment, and have been assumed to be in place for the purposes of the assessment presented in the EIA Report:

Excavated Groundworks

- Use of appropriate supporting structures around peat excavations to prevent collapse and the development of tension cracks.
- Avoid cutting trenches or aligning excavations across slopes (which may act as incipient head scarps for peat failures) unless appropriate mitigation has been put in place.
- Implement methods of working that minimise the cutting of the toes of slopes, 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.
- 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).

Permanent Tracks

- Prior to the construction, setting out the centreline of the proposed track should include a walk over performed by the site manager or general foreman, along with the suitably qualified Geotechnical Engineer, and appropriate Clerk of Works. This should be

carried out to check that the ground conditions/drainage paths are as expected, and "fine-tuning / micrositing" of the alignment if required.

- Maintain drainage pathways through tracks to avoid ponding of water upslope.
- Monitor the top line of excavated peat deposits for deformation post-excavation.
- Monitor the effectiveness of cross-track drainage to ensure water remains free-flowing and that no blockages have occurred.
- Where upgraded tracks are required, existing tracks and surrounding areas should be further investigated to determine the most suitable sections to upgrade. Avoiding deeper areas of peat adjacent to the existing track is deemed a priority.
- Where possible, upgraded sections of track should tie into the existing track construction.

Temporary Tracks

- Prior to the construction, setting out the centreline of the proposed track should include a walk over performed by the site manager or general foreman, along with the suitably qualified Geotechnical Engineer, and appropriate Clerk of Works. This should be carried out to check that the ground conditions / drainage paths are as expected, and "fine-tuning / micrositing" of the alignment if required.
- Weather policy should be agreed and implemented during works, e.g. identifying 'stop' rules (i.e. weather dependent criteria) for cessation of track construction or trafficking (e.g. allowing tracks to thaw following periods of hard frost).
- Allow peat to undergo primary consolidation by adopting rates of road construction appropriate to weather conditions.

Peat Storage

Providing a detailed plan of all potential temporary storage locations for peat for the whole development area is not considered appropriate at this initial planning stage based on the current limited information. However, the following control measures and good practice when considering temporary storage of peat during the construction.

- The location of potential peat storage areas should not be sited on areas identified with 'medium' or higher peat landslide likelihoods.
- Site specific stability analysis should be undertaken for all areas of peat storage to ensure the likelihood of destabilisation of underlying peat is minimised. Analysis should consider the slope angle of the storage location, the thickness of peat being stored and being loaded and use representative parameters for both the stored and underlying peat.
- Avoid storage of peat in areas of peat >1 m in depth.
- Ensure adequate drainage is maintained for any peat storage areas.
- Minimise haul distances for peat, storing as near to excavation as possible.
- Monitor effects of wetting / re-wetting stored peat on surrounding peat areas, and prevent water build up on the upslope side of peat mounds.

Monitoring during and post construction

The following activities will be built into any monitoring of groundworks undertaken for the development:

- Ponding on the upslope side of infrastructure sites and on the upslope side of access tracks.
- Subsidence and lateral displacement of tracks.
- Blockage or underperformance of the installed site drainage system.
- Development of tension cracks, compression features, bulging or quaking bog anywhere in a 50m corridor surrounding the site of any construction activities or site works.

This monitoring should be undertaken on a quarterly basis in the first year after construction, biannually in the second year after construction and annually thereafter; in the event that unanticipated ground conditions arise during construction, the frequency of these intervals should be reviewed, revised and justified accordingly.

General Good Practice

In addition to these control measures, the following good practice should be followed:

- A geotechnical risk register (GRR) should be prepared for the proposed development following intrusive investigations post-consent and location specific stability analyses – the risk register should be considered a live document and updated with site experience as infrastructure is constructed.
- The observation of any peat instability and pre-failure indicators should be recorded in the GRR during the setting out of proposed works.
- All construction activities and operational decisions that involve disturbance to peat deposits should be overseen by an appropriately qualified geotechnical engineer with experience of construction on peat sites.
- Awareness of peat instability and pre-failure indicators should be incorporated in site induction and training to enable all site personnel to recognise ground disturbances and features indicative of incipient instability.
- Monitoring checklists should be prepared with respect to peat instability addressing all construction activities proposed for site.
- A documented procedure shall be in place and rapid reaction strategy in place prior to the commencement of construction on peat land. This strategy shall be enacted should signs of peat movement be recorded across the proposed development. This approach requires periodic and continued monitoring of the construction process by a suitably qualified geotechnical engineer.
- A detailed Construction Environmental Management Plan (CEMP) shall be produced and incorporate the conclusions of the peat stability report, continuously update the assessment and develop appropriate mitigations to respond to the peat slide risk as development proceeds.
- As part of the GRR, regular inspection and monitoring of stored peat should be undertaken until temporary storage has been completed. This involves the recording of any visual signs of ground movement including identification of tension cracking or slumping of peat material. Future inspection frequency would be determined post construction and be dependent upon meteorological conditions.
- Awareness of peat instability and pre-failure indicators should be incorporated in site induction and training to enable all site personnel to recognise ground disturbances and features indicative of incipient instability.

6.3 Proposed Mitigation

As noted in **Figure 10.1.9**, where the risk assessment has identified a negligible or low risk of peat instability, no specific mitigation measures are necessary. However, to ensure best practice is employed, there would be a need for careful monitoring and the construction management must include careful design of both the permanent and temporary works appropriate for peat soils, as detailed in Section 6.2.

The areas of the infrastructure that were rated as medium risk, or above, were subjected to a hazard assessment; a number of areas were discounted as they do not fall within influencing distance of any of the key proposed site infrastructure. The procedure adopted was to review the peat slide risk data and identify those areas with a medium risk or greater, that were in close proximity or influencing distance of any of the proposed infrastructure or watercourses. Those risk areas where there is no development would not affect the natural stability of the peat.

Table 6-1 lists the locations that have been identified to have a medium risk of peat instability on the proposed development infrastructure. A variety of mitigation measures are recommended to reduce the risk of peat instability. Analysis of each location has shown that all can be mitigated to a Hazard Ranking of “Insignificant”.

Table 6-1: Risk Register

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
1	Medium	Low	Significant	New access track	Unnamed watercourse up-slope of PWS06	Risk location impacted by very localised peat deposit (0.5 to 1m) and steep slopes. Risk of peat instability negligible due to absence of substantial peat deposits up-slope of proposed track. Mitigation proposed within the Outline Drainage Concept for the Proposed Access Track - discussed in PWSRA TA 10.5 should be adhered to. During excavations peat should be removed prior to construction of track which would reduce and mitigate risk of peat landslide towards receptor. No further mitigation is deemed necessary due to limited peat deposits. However, good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
2	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by very localised peat deposits (up to 2.5m deep) formed within a topographical hollow. If possible micro-siting of access track out of the topographical hollow would be preferable in the first instance. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
3	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by localised peat deposits (0.5 to 2m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
4	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by very localised peat deposit (0.5 to 1m) and steep slopes. Risk of peat instability negligible due to absence of substantial peat deposits up-slope of proposed track. During excavations peat should be removed prior to construction of track which would reduce and mitigate risk of peat landslide towards receptor. No further mitigation is deemed necessary due to limited peat deposits. However, good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
5	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by very localised peat deposit (0.5 to 1m) and steep slopes. Risk of peat instability negligible due to absence of substantial peat deposits up-slope of proposed track. During excavations peat should be removed prior to construction of track which would reduce and mitigate risk of peat landslide towards receptor. No further mitigation is deemed necessary due to limited peat deposits. However, good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
6	Medium	Low	Significant	New access track	New access track	Risk location impacted by very localised peat deposits (up to 2m deep) formed within a topographical hollow. If possible micro-siting of access track out of the topographical hollow would be preferable in the first instance. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
7	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by localised peat deposits (0.5 to 2m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
8	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by very localised peat deposits (up to 2.5m deep) formed within a topographical hollow.	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
						If possible micro-siting of access track out of the topographical hollow would be preferable in the first instance. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	
9	Medium	Low	Significant	New access track	T9 turbine & hardstanding	Risk location impacted by localised peat deposits (0.5 to 2m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
10	Medium	Low	Significant	New access track	New access track	Risk location impacted by localised peat deposits (0.5 to 2m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
						the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	
11	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by very localised peat deposits (up to 3m deep) formed within a topographical hollow. If possible micro-siting of access track out of the topographical hollow would be preferable in the first instance. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
12	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by localised peat deposits (0.5 to 1.5m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide.	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
						Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	
13	Medium	Low	Significant	T12 hardstanding	Unnamed watercourse	Risk location impacted by localised peat deposits (0.5 to 2m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
14	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by very localised peat deposit (0.5 to 1m) and steep slopes. Risk of peat instability negligible due to absence of substantial peat deposits up-slope of proposed track. During excavations peat should be removed prior to construction of track which would reduce and mitigate risk of peat landslide towards receptor. No further mitigation is deemed necessary due to limited peat deposits. However, good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
15	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by very localised peat deposit (0.5 to 1m) and steep slopes. Risk of peat instability negligible due to absence of substantial peat deposits up-slope of proposed track. During excavations peat should be removed prior to construction of track which would reduce and mitigate risk of peat landslide towards receptor.	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
						No further mitigation is deemed necessary due to limited peat deposits. However, good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	
16	Medium	Low	Significant	T13 hardstanding	Unnamed watercourse	Risk location impacted by very localised peat deposit (0.5 to 1m) and steep slopes. Risk of peat instability negligible due to absence of substantial peat deposits up-slope of proposed track. During excavations peat should be removed prior to construction of track which would reduce and mitigate risk of peat landslide towards receptor. No further mitigation is deemed necessary due to limited peat deposits. However, good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
17	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by localised peat deposits (0.5 to 1.5m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
18	Medium	Low	Significant	New access track	GWDTE and unnamed watercourse	Risk location impacted by very localised peat deposits (up to 2.5m deep) formed within a topographical hollow. If possible micro-siting of access track out of the topographical hollow would be preferable in the first instance.	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
						Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	
19	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by localised peat deposits (0.5 to 2.5m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
20	Medium	Low	Significant	New access track	Finglen Burn	Risk location impacted by very localised peat deposits (up to 3m deep) formed within a topographical hollow. If possible micro-siting of access track out of the topographical hollow would be preferable in the first instance. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
						the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	
21	Medium	Low	Significant	T8 turbine & hardstanding	Finglen Burn	Risk location impacted by localised peat deposits (0.5 to 2m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
22	Medium	Low	Significant	New access track	Finglen Burn	Risk location impacted by localised peat deposits (0.5 to 2.5m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
23	Medium	Low	Significant	T8 hardstanding	Finglen Burn	Risk location impacted by localised peat deposits (0.5 to 2m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
24	Medium	Low	Significant	New access track	Finglen Burn	Risk location impacted by localised peat deposits (0.5 to 2.5m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
25	Medium	Low	Significant	T7 hardstanding	Finglen Burn	Risk location impacted by localised peat deposits (0.5 to 2.5m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
						the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	
26	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by localised peat deposits (0.5 to 3m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
27	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by localised peat deposits (0.5 to 2.5m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
28	Medium	Low	Significant	Temporary construction compound 3	New access track	Risk location impacted by localised peat deposits (0.5 to 2.5m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
29	Medium	Low	Significant	New access track	East Cameron Burn	Risk location impacted by very localised peat deposits (up to 3m deep) formed within a topographical hollow. If possible micro-siting of access track out of the topographical hollow would be preferable in the first instance. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
30	Medium	Low	Significant	T2 turbine & hardstanding	East Cameron Burn	Risk location impacted by localised peat deposits (0.5 to 1.5m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
						of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	
31	Medium	Low	Significant	T1 turbine & hardstanding	Unnamed watercourse	Risk location impacted by localised peat deposits (0.5 to 2m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
32	Medium	Low	Significant	T11 turbine & hardstanding	Unnamed watercourse	Risk location impacted by localised peat deposits (0.5 to 3m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide.	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
						Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	
33	Medium	Low	Significant	New access track	Finglen Burn	Risk location impacted by localised peat deposits (0.5 to 3m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
34	Medium	Low	Significant	New access track	Finglen Burn	Risk location impacted by localised peat deposits (0.5 to 2.5m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
35	Medium	Low	Significant	New access track	Finglen Burn	Risk location impacted by localised peat deposits (0.5 to 3m) and steep slopes across the proposed infrastructure.	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
						Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	
36	Medium	Very Low	Insignificant	New access track	Medaff Burn	Risk location impacted by localised peat deposits (0.5 to 3m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
37	Medium	Low	Significant	New access track	Unnamed watercourse	Risk location impacted by localised peat deposits (0.5 to 1m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works.	Insignificant

Identified Risk Location	Risk Rating	Impact Rating	Hazard Ranking	Infrastructure at Risk Zone	Key Receptor	Mitigation	Revised Hazard Ranking
						Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	
38	Medium	Very Low	Insignificant	T5 turning head	Unnamed watercourse	Risk location impacted by localised peat deposits (0.5 to 1.5m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant
39	Medium	Low	Significant	T5 hardstanding	Unnamed watercourse	Risk location impacted by localised peat deposits (0.5 to 2m) and steep slopes across the proposed infrastructure. Excavation of peat prior to construction would reduce and mitigate risk of peat landslide towards receptor. Suitable shoring of excavations would assist in mitigating risk during construction. Catch wall ditches or fences could be constructed downslope of the risk location to mitigate against any peat slide during construction works. Drainage pathways should be maintained during and post construction to reduce risk of peat slide. Good construction practices, as detailed in Section 6.2, should be followed to mitigate against any instability.	Insignificant

7.0 Conclusion

This report has highlighted the complicated inter-relationship between all the aspects that have an effect on the stability of peat. Consequently, the discussion has also addressed areas of construction and drainage in order to avoid a stability problem rather than attempt to put it right after the event. The proposed development has been assessed for potential hazards associated with peat instability; the assessment has been based on:

- A walk-over survey by an experienced geologist and geotechnical engineer;
- A thorough inspection of the digital terrain map;
- Review of historical and geological maps and publications and aerial photography; and
- A detailed geotechnical probing exercise at 7,299 locations in areas of identified peaty soil/peat to determine the thickness thereof.

The peat was found to vary across the proposed development in terms of thickness and coverage. Peat deposits are most frequent across the central and eastern parts of the proposed development. Deposits are typically localised and associated with topographic hollows, gentle slopes and flatter expanses that allow for the formation of peat. The main access track and areas of forestry plantation are largely absent of significant peat deposits.

The results indicate that 7% of probe locations are at medium risk of peat instability.

The overall conclusion regarding peat stability is that there is a negligible to low risk of peat instability over most of the main site although some areas of medium and high risk have been identified. For these areas, a hazard impact assessment was completed which concluded that, subject to micro-siting and the employment of appropriate mitigation measures, all these areas can be considered as an insignificant hazard. Additional mitigation measures have been identified in areas where hazards are already considered insignificant to further reduce the risk of potential hazards occurring.