8. LAND, SOILS AND GEOLOGY

8.1 Introduction

8.1.1 Background and Objectives

Hydro-Environmental Services (HES) was engaged by MKO to provide a description and assessment of the direct and indirect effects of the Existing Development on the land, soils and geological environment.

The Existing Development, detailed fully in Chapter 4 of this Remedial Environmental Impact Assessment Report (rEIAR), includes all works carried out at the Wind Farm Site and the Grid Connection Site from November 2019 to the present day.

As detailed in Section 1.1.1 in Chapter 1 of this rEIAR, the various project components are described and assessed using the following references: 'Subject Development', 'Existing Development', 'Prospective Development', 'Permitted Development', 'Site', 'Wind Farm Site', 'Grid Connection Site', 'BMEP Site', 'Grid Connection', '2017 EIAR', the 'November 2020 Peat Slide', and 'proposed turbines' or 'proposed turbine locations'.

This chapter presents:

- A description of the baseline sensitivity and importance of the receiving land, soils and geological environment based on the baseline site conditions prior to the commencement of construction of the Existing Development;
- The mitigation and monitoring measures which were implemented during the construction of the Existing Development for the protection of the land, soils and geological environment;
- An assessment of the residual effects of the Existing Development on the land, soils and geological environment; and,
- An assessment of the cumulative effects from the Existing Development and other projects in the surrounding area, and the transboundary effects.

8.1.2 Statement of Authority

Hydro-Environmental Services (HES) are a specialist geological, hydrological, hydrogeological and environmental practice which delivers a range of water and environmental management consultancy services to the private and public sectors across Ireland and Northern Ireland. HES was established in 2005, and our office is located in Dungarvan, County Waterford.

Our core areas of expertise and experience includes soils, subsoils and geology. We routinely complete impact assessments for land, soils and geology, hydrology and hydrogeology for a large variety of project types including wind farms and renewable energy projects.

This chapter of the rEIAR was prepared by Michael Gill and Conor McGettigan.

Michael Gill (BA, BAI, Dip Geol., MSc, MIEI) is an Environmental Engineer and Hydrogeologist with over 24 years' environmental consultancy experience in Ireland. Michael has completed numerous geological, hydrological and hydrogeological impact assessments of wind farms and renewable projects in Ireland. Michael has worked on over 100 wind farm-related projects including original application for Meenbog Wind Farm.

Conor McGettigan (BSc, MSc) is an Environmental Scientist with over 5 years' experience in the environmental sector in Ireland. Conor holds an M.Sc. in Applied Environmental Science (2020) and a B.Sc. in Geology (2016) from University College Dublin. Conor routinely prepares the land, soils and geology chapters of environmental impact assessment reports for wind farm development on peatlands. Conor has also worked on several substitute consent applications for works in peatlands including peat extraction at the Ballivor Bog Group and at Lemanaghan Bog.

8.1.3 Scoping and Consultation

The scope for this assessment has been informed by consultation with statutory consultees, bodies with environmental responsibility and other interested parties as summarised in Section 2.8 of Chapter 2 of the rEIAR. Consultation responses relating to the land, soils and geological environment were received from the Geological Survey of Ireland (GSI), the Health Service Executive (HSE) and the Irish Peatland Conservation Council (IPCC). Summaries of the responses are detailed below in Table 8-1. Further details are outlined in Section 2.8.2 of this rEIAR.

Table 8-1: Summary Consultations with respect to the land, soils and geological environment

Consultee	Description	Addressed in Section
GSI	*"Our records show that there is a CGS in the study area of the proposed wind farm[...]This site should be assessed as an environmental constraint. Ideally, the site should not be damaged or integrity impacted or reduced in any manner due to the proposed construction and modification of access roads, from traffic due to access road construction and turbine installation. This would include impacts that may be related to altered drainage patterns, changes in soil profiles and structures etc. However, this is not always possible, and in this situation appropriate mitigation measures should be put in place to minimize or mitigate potential impacts."*	Refer to Section 8.5.2.7
	Landslides are common in areas of peat, rock near surface and in fine to coarse range materials (such as glacial tills), areas which are found within the proposed wind farm area. The Landslide Susceptibility map indicates variable landslide susceptibility within the study area, including areas of 'Moderately High' to 'High' susceptibility. We note in the scoping document, reference to the peat slide close to the wind farm that occurred in November 2020. The potential for run-out from peat failure should be addressed.	Refer to Sections 8.3.8 and 8.5.2.8
HSE	*"A detailed assessment of the current ground stability of the site for the proposed renewable energy development and all proposed mitigation measures should be detailed in the EIAR. The assessment should include the impact construction work may have on the future stability of ground conditions, taking into consideration extreme weather events, site drainage and the potential for soil erosion."*	Refer to Sections 8.3.8 and 8.5.2.8

	"The Environmental Health Service recommends that a detailed Peat Stability/Geotechnical Assessment of the proposed site should be undertaken to assess the suitability of the soil for the proposed development. The EIAR should include provision for a peat stability monitoring programme to identify early signs of potential bog slides ('pre-failure indicators' see the Scottish Government's 'Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Developments 2017)"	Refer to PSA (Appendix 8-1) and Sections 8.3.8 and 8.5.2.8
IPCC	*"What is the total amount of peat which was moved around, comparing the original consented and the difference with the deviations".*	The volumes of peat excavated as a result of the Existing Development are detailed in the PSMP (Appendix 4-2) and Section 8.4.1
	Has the additional excavation of rock altered the hydrological impacts and regime of the development and the landscape.	The effects on hydrology are assessed in Chapter 9. The effects on land, including topography are assessed in Section 8.5.2.6.
	Why was the development not stopped when there seems to have been two previous "minor" peat slides on the eastern flank of the Bunadaowen River Valley during construction?	Details of the minor peat slides and the appropriate mitigation measures which were implemented at that time are detailed in the PSA (Appendix 8-1).

8.1.4 Relevant Legislation

The rEIAR is prepared in accordance with the requirements of European Union Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the 'EIA Directive') as amended by Directive 2014/52/EU. The requirements of the following legislation are complied with:

- Planning and Development Act, 2000 (as amended);
- Planning and Development Regulations, 2001 (as amended);
- Directives 2011/92/EU and 2014/52/EU on the assessment of the effects of certain public and private projects on the environment;
- S.I. No. 296/2018 European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018;
- The Heritage Act 1995, as amended; and,
- European Communities (Environmental Impact Assessment) Regulation 1989 to 2006.

8.1.5 Relevant Guidance

In addition to the guidance set out in section 1.2.2 of Chapter 1, the Land, Soils and Geology chapter of this rEIAR was prepared in accordance with the following documents:

- Institute of Geologists Ireland (2013): Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements; and,
- National Roads Authority (2008): Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

8.2 Assessment Methodology

8.2.1 Desk Study

A desk study of the Wind Farm Site and Grid Connection Site and the study area (refer to Section 8.2.4 below for a definition of the study area) was completed in January and February 2024 to collect all relevant geological data. The desk study was completed to supplement site specific data which has been gathered for the Wind Farm Site and Grid Connection Site and is detailed in Section 8.2.2. This desk study was checked and updated, where necessary (as new data may have been published) in January 2026 and updated further in May 2026.

The desk study included consultation with the following on-line and hard copy data sources:

- Environmental Protection Agency database (**www.epa.ie**);
- Corine Land Cover and Land Cover Change Maps (**www.land.copernicus.eu**);
- Geological Survey of Ireland - Groundwater and Geology Databases (**www.gsi.ie**);
- Geological Survey of Ireland – Geological Heritage site mapping (**www.gsi.ie**);
- Bedrock Geology 1:100,000 Scale Map Series, Sheet 3 (Geology of South Donegal). Geological Survey of Ireland (GSI, 1999);
- Geological Survey of Ireland – 1:25,000 Field Mapping Sheets;
- General Soil Map of Ireland 2nd edition (**www.epa.ie**); and,
- Aerial Photography, 1:5000 and 6 inch base mapping.

The desk study also included a review of all available site-specific reports and assessments which have been previously completed for the Permitted Development. The consulted documents included the following:

- 2017 EIAR (Meenbog Wind Farm Environmental Impact Assessment Report. Prepared for Planree Ltd, (Planning Reference ABP-300460-17); and,
- Meenbog Wind Farm 2019 Construction and Environmental Management Plan (CEMP) updated from 2017 under condition compliance and submitted to Donegal County Council).

Fehily Timoney (FT) produced a Peat Stability Assessment (PSA) Report for the Existing Development (FT, 2026) which is included as Appendix 8-1 of this rEIAR. This PSA relies on a comprehensive site specific geological dataset which is detailed below in Section 8.2.2. The desk study components of the PSA included a detailed review of the following documents:

- FT (2021): Meenbog Wind Farm – Peat Stability Assessment of Meenbog Wind Farm Site. This report included a site-wide geomorphological assessment undertaken by FT which is included as Appendix 8-2 of this rEIAR (Note that FT acquired AGEC Ltd (AGEC) in 2019);
- Ionic (2021) completed a peat stability assessment of the Existing Development in 2021 (Appendix D of Appendix 8-2);
- AFRY (2023) completed a site visit in October 2023 to assess the overall site stability of the constructed works. AFRY's Technical Note is included in Appendix A of Appendix 8-1 (Note that AFRY acquired Ionic Consulting Ltd (Ionic) in July 2022; and,
- All available notes and construction records which were recorded during the construction of the Existing Development.

8.2.2 Baseline Monitoring and Site Investigations

A comprehensive and robust geological dataset has been collected at the Wind Farm Site and Grid Connection Site across multiple phases of site investigations which included site investigations completed as part of the baseline assessment for the 2017 EIAR, site investigations completed during the construction phase of the Existing Development, site investigations completed in the aftermath of the 12th November 2020 Peat Slide and site investigations completed specifically for the purposes of this rEIAR.

HES completed a detailed review of the 2017 EIAR and site investigations which were completed as part of the baseline assessment of this rEIAR. The site investigations completed to inform the 2017 EIAR, accumulated an extensive site specific dataset and consisted of site surveys, extensive peat probing and geotechnical investigations. A Peat Stability Risk Assessment Report (PSRA) (AGEC, 2017) was also completed for the permitted wind farm development which was appended to the 2017 EIAR.

Further site investigations were completed during the construction of the Existing Development to inform detailed design decisions, with additional site investigations completed following the November 2020 Peat Slide. These site investigations comprised of the following:

- Peat probes and in-situ shear vanes were undertaken within the wind farm footprint area by AFRY (formerly Ionic Consulting Ltd – note that Ionic Consulting was acquired by AFRY in July 2022 ;
- A total of 9 no. rotary core boreholes were drilled at various infrastructure locations (at the substation and 8 no. turbine locations) across the Wind Farm Site in May 2020 by Irish Drilling Ltd (IDL);
- A total of 4 no. trial pits were excavated at the Wind Farm Site in 2021 (close to T4, T5, T7 and T18) in order to provide more detail on peat classification and peat strength at depth and to retrieve subsoil peat samples for laboratory analysis; and,
- Peat cores at turbine locations were obtained using an RPS (Russian Peat Sampler) to confirm the nature of characteristics of peat at the Wind Farm Site and all samples were logged in accordance with the Von Post classification to determine the degree of peat humidification.

The above site investigations informed an assessment of the Wind Farm Site stability submitted to the EPA in 2021 (Fehily Timoney (FT), 2021 – attached as Appendix 8-2). Furthermore, AFRY completed an inspection of the works completed at the Wind Farm Site in October 2023 in order to comment on the status of the Wind Farm Site in relation to peat stability. A Technical Note arising from this site inspection is included in Appendix A of Appendix 8-2.

For the specific purposes of this rEIAR:

- MKO have completed several multi-disciplinary walkover surveys at the Wind Farm Site and Grid Connection Site between 2019 and 2026, including pre-construction surveys in 2019 and construction phase monitoring;
- 5 no. groundwater monitoring wells were drilled at the Wind Farm Site in April 2025 by Peterson Drilling Services Ltd under the supervision of HES (Appendix 8-3);
- FT completed additional peat probing at the Wind Farm Site in 2025 and,
- FT utilised all of the above data to inform a Peat Stability Assessment (PSA) Report completed for the Existing Development (FT, 2026). This PSA report is attached as Appendix 8-1 and is summarised in Section 8.3.8.2.

In total, approx. 3,400 no. peat probes have been completed at the Wind Farm Site across the multiple phases of site investigations discussed above.

The data obtained from all of these site investigations have been used in the characterisation and description of the baseline land, soils and geological environment presented in Section 8.3.

8.2.3 Impact Assessment Methodology

EPA, 2022, states that there are 7 no. steps in the preparation of an EIAR. The initial steps relate to screening, scoping, the consideration of alternatives and the description of the project. Step 5 relates to the description of the baseline environment which is presented in Section 8.3 for the land, soils and geological environment. Step 6 relates to the assessment of impacts and is presented in Section 8.5.

The guideline criteria in EPA, 2022 require that the baseline environment is described in terms of the context, character, significance and sensitivity of the existing environment. In addition, using information from the desk study and data from the site investigations, an assessment of the importance of the land, soil and geological environment within the study area and Site is assessed using the criteria set out in Table 8-2 (NRA, 2008).

Table 8-2: Estimation of Importance of Soil and Geology Criteria (NRA, 2008)

Importance	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale.	Geological feature rare on a regional or national scale (NHA). Large existing quarry or pit. Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying site is significant on a local scale.	Contaminated soil on site with previous heavy industrial usage. Large recent landfill site for mixed wastes Geological feature of high value on a local scale (County Geological Site). Well drained and/or highly fertility soils. Moderately sized existing quarry or pit Marginally economic extractable mineral resource.
Medium	Attribute has a medium quality, significance or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and/or soft organic soil underlying site is moderate on a local scale.	Contaminated soil on site with previous light industrial usage. Small recent landfill site for mixed Wastes. Moderately drained and/or moderate fertility soils. Small existing quarry or pit. Sub-economic extractable mineral Resource.
Low	Attribute has a low quality, significance or value on a local scale.	Large historical and/or recent site for construction and demolition wastes. Small historical and/or recent landfill site

Importance	Criteria	Typical Example
	Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying site is small on a local scale.	for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral Resource.

The assessment of effects follows the description of the baseline environment and is Step 6 of the information which must be included in an EIAR. The guideline criteria for the assessment of effects states that the purpose of an EIAR is to identify, describe and present an assessment of the likely significant effects. The likely effects are described with respect to their quality (positive, neutral or negative), significance (imperceptible to profound), extent (i.e. size of area or number of sites affected), context (is the effect unique or being increasingly experienced), probability (likely or unlikely), duration (momentary to permanent), frequency and reversibility. The descriptors used in this rEIAR are those set out in the EPA, 2022 glossary of effects as shown in Chapter 1 of this rEIAR.

In order to provide an understanding of this descriptive system in terms of the geological/hydrological environment, elements of this system of description of effects are related to examples of potential likely significant effects on the geology and morphology of the existing environment, as listed in Table 8-3.

Table 8-3: Impact descriptors related to the receiving environment

Impact Characteristics		Potential Geological and Hydrological Effects
Quality	Significance	
Negative only	Profound	Widespread permanent impact on: The extent or morphology of a cSAC. Regionally important aquifers. Extents of floodplains. Mitigation measures are unlikely to remove such impacts.
Positive or Negative	Significant	Local or widespread time-dependent impacts on: The extent or morphology of a cSAC / ecologically important area. A regionally important hydrogeological feature (or widespread effects to minor hydrogeological features). Extent of floodplains. Widespread permanent impacts on the extent or morphology of an NHA/ecologically important area. Mitigation measures (to design) will reduce but not completely remove the impact – residual impacts will occur.
Positive or Negative	Moderate	Local time-dependent impacts on: The extent or morphology of a cSAC / NHA / ecologically important area. A minor hydrogeological feature. Extent of floodplains.

Impact Characteristics		Potential Geological and Hydrological Effects
Quality	Significance	
		Mitigation measures can mitigate the impact OR residual impacts occur, but these are consistent with existing or emerging trends
Positive, Negative or Neutral	Slight	Local perceptible time-dependent impacts not requiring mitigation.
Positive, Negative or Neutral	Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Neutral	Imperceptible	No impacts, or impacts which are beneath levels of perception, within normal bounds of variation, or within the bounds of measurement or forecasting error.

8.2.4 Study Area

The study area for the land, soils and geological remedial impact assessment is limited to within the Wind Farm Site and Grid Connection Site. The study area for this remedial impact assessment does not include the BMEP Site as no works have been completed to date in this area.

Due to the localised nature of the construction works, effects on the land, soils and geological environment will not have extended beyond the vicinity of the Existing Development footprint. The construction works associated with the Existing Development were found to be a likely contributory factor to the November 2020 Peat Slide (FT, 2026). The effects on the land, soils and geological environment associated with the November 2020 Peat Slide extended some distance away from the Existing Development footprint, but the effects on the land, soils and geological environment largely remained within the Wind Farm Site boundary. There was some deposition of material along the banks of the Shruhangarve Stream leading down to the Mourne Beg River following the November 2020 Peat Slide, which was remediated under Section 12 of the Water Pollution Act. The peat slide entered the Shruhangarve Stream within the Wind Farm Site and peat was transported downstream. This pathway is reflected in the study area described in Chapter 9: Hydrology and Hydrogeology. The effects on water quality in the aftermath of the November 2020 Peat Slide are assessed in Chapter 9. In terms of the land, soils and geological environment, there were no effects outside of the Wind Farm Site.

8.2.5 Limitations and Difficulties Encountered

No limitations or difficulties were encountered in the preparation of this chapter of the rEIAR. The retrospective impact assessment has been carried out based on the availability of the information relating to the construction of the Existing Development. The retrospective impact assessment has been enhanced by the large quantity of information available for the baseline environment, which was presented in the EIAR for the Permitted Development. In addition, a large quantum of data (site investigation data) has been obtained since 2017, during the construction of the Existing Development.

8.3 Establishing the Baseline Environment

8.3.1 Site Description and Topography

The Site refers to the three distinct elements – the Wind Farm Site, Grid Connection Site, and BMEP Site combined, measures approximately 1,018 hectares (ha). Note that no activities associated with the Existing Development occurred within the BMEP Site and therefore the BMEP Site is not discussed further in this rEIAR Chapter.

The Wind Farm Site is located within a rural, agricultural setting in County Donegal approximately 8 km southwest of the twin towns of Ballybofey and Stranorlar and approximately 12 km northeast of Donegal Town at its nearest point. The Grid Connection Site extends southwest from the Wind Farm Site for approximately 6 km along the N15 National Road towards Donegal Town before continuing south and east along local roads and through agricultural fields and private track to the Clogher 110kV substation.

8.3.1.1 Wind Farm Site

Current land-use at the Wind Farm Site comprises a partially constructed wind farm (i.e. the Existing Development), areas of commercial forestry and areas of open blanket bog. The surrounding landcover/use predominantly comprises peat bogs, commercial forestry and other semi-natural areas with limited residential use along local roads.

Prior to the construction of the Existing Development, a network of existing forestry access tracks provided access in and around the Wind Farm Site. The Wind Farm Site was covered by blanket bog with few natural mineral subsoil or bedrock exposures. However, there were a number of pre-existing borrow pits where the subsoil and bedrock profile were observed and showed that the peat at the Wind Farm Site directly overlies bedrock, weathered bedrock or very thin pockets of subsoils.

The elevation of the Wind Farm Site ranges between ~180 and ~313mOD (metres above Ordnance Datum), with elevations generally decreasing and sloping in a north or north-westerly direction. A small section in the south of the Wind Farm Site slopes to the southeast. The Wind Farm Site is generally bordered on all sides by forestry plantations with the eastern and southern boundaries also being defined by the Northern Ireland border. The majority of the Wind Farm Site slopes in a north-westerly direction towards the Bunadaowen River. The southern section of the Wind Farm Site slopes to the southeast towards the Glendergan River.

Existing access is from the N15 National Road in the northwest of the Wind Farm Site and via a local road in the north Wind Farm Site. The N15 National Road runs south-west to north-east, with the Wind Farm Site lying about 2 km east of the road.

Construction of the Existing Development commenced in November 2019, at which point the majority of the civil engineering works, including wind farm access roads, 110kV electrical substation, turbine hardstands, turbine foundations, and ancillary works were substantially completed over the following 12-month period up to November 2020 when a peat slide occurred. The Existing Development footprint (~32.6ha) covers only a very small percentage (~3.7%) of the overall Wind Farm Site (~892ha).

8.3.1.2 Grid Connection Site

The Grid Connection Site extends southwest from the Wind Farm Site for approximately 6 km along the N15 National Road towards Donegal Town before continuing south and east along local roads and through agricultural fields to the Clogher 110kV substation. The Grid Connection Site covers a total area of 9ha.

The Grid Connection is primarily located along the existing public road network. The Grid Connection extends from the N15 National Road to the L-2595 Local Road, then proceeds to the L-1985 Local Road and continues along the L-19825 Local Road, with a small section along private lands to reach the Clogher substation. The Clogher substation is situated approximately 6.5 km from the on-site substation within the Wind Farm Site. The length of the Grid Connection underground cable route from the on-site 110kV substation to Clogher 110kV substation is ~9.4 km.

The landcover/use in the lands surrounding the Grid Connection Site is predominantly forestry with sections of peat cutting, farming and open peatlands.

Ground elevations along the Grid Connection Site are greatest in the vicinity of the Wind Farm Site entrance where ground elevations stand at ~153mOD. Elevations decrease along the N15 National Road to the southwest, with the lowest elevations being at ~80mOD. Ground elevations along the Grid Connection underground cable route rise again from the N15 National Road towards Clogher 110kV substation which stands at ~142mOD.

8.3.2 Land (Land Cover)

8.3.2.1 Baseline Environment

8.3.2.1.1 *Wind Farm Site*

Corine land cover maps (2012) show that the Wind Farm Site was comprised of coniferous forestry in the east, transitional woodland scrub in the northwest and a small area of peat bogs in the northwest and northeast. It is worth noting that Corine land cover maps are based on the interpretation of satellite imagery and national data, with a minimum mapping unit of 25ha and a minimum feature width of 100m. Therefore, this is a large-scale dataset and does not pick up small scale variations in land and land cover. Such local (small scale) variations are confirmed during walkover surveys and ground truthing as outlined below.

The baseline land cover at the Wind Farm Site was verified during several walkover surveys completed by HES and MKO, from the inspection of aerial imagery and from habitat mapping completed by ecologists as part of the baseline characterisation for the 2017 EIAR. Consistent with the Corine mapping, the Wind Farm was noted to comprise mostly of coniferous forestry plantations, with the remaining un-forested peatland areas being exploited for turbary or comprising of blanket bog.

The Wind Farm Site was also dissected by a series of forestry access tracks. It is estimated that up to 15km of access tracks were present across the Wind Farm Site prior to the construction of the Existing Development. Many of these tracks were upgraded as part of the Existing Development. It is noted that forestry borrow pits were present at the locations of BP1 and the Peat Cell southeast of the substation prior to the construction of the Existing Development.

8.3.2.1.2 *Grid Connection Site*

Corine land cover maps (2018) show that the Grid Connection Site is located in areas of peat bogs in the north, in the vicinity of the Wind Farm Site, and further to the south at Clogher 110kV substation. The lower elevations at the Grid Connection Site surrounding the N15 National Road are mapped by Corine as agricultural land. Clogher 110kV substation itself is also mapped in an area of peat bogs.

The baseline land cover at the Grid Connection Site was verified during surveys completed by HES and MKO, from the inspection of aerial imagery and from habitat mapping completed by ecologists as part of the baseline characterisation for the 2017 EIAR. The Grid Connection underground cable route follows the pre-existing site access roads as it exits the Wind Farm Site onto the N15 National Road. The route primarily follows the pre-existing public road network to the Clogher 110kV substation, with

a short off road section across agricultural land parallel to the public road and the final section of the cabling route across the private access track to Clogher Substation.

8.3.2.2 Existing Environment

8.3.2.2.1 *Wind Farm Site*

Current land-use at the Wind Farm Site is comprised of the Existing Development, areas of commercial forestry and blanket bog, and public roadways. The most recent Corine land cover map (2018) is largely the same as the 2012 mapping described above in Section 8.3.2.1.1.

The footprint of the Existing Development within the Wind Farm Site is ~32.6 ha representing approximately 3.7% of the Wind Farm Site. Within the Wind Farm Site the Existing Development consists of site access roads, hardstand areas, blade set-down areas, turbine foundations, borrow pits, temporary construction compounds and peat and spoil management areas. The majority of the footprint of the Existing Development is located in areas of coniferous forestry which required felling during the construction phase. Only 2 no. turbines (T16 and T19) are located on open peatland.

Full details of the Existing Development are provided in Chapter 4 of this rEIAR. An assessment of the effects of the construction of the Existing Development on the land/land cover at the Wind Farm Site is presented in Section 8.5.2.1.

8.3.2.2.2 *Grid Connection Site*

Current land-use at the Grid Connection Site comprises public roads and improved agricultural grasslands (on the section which runs parallel to the public road) as far as the Clogher 110kV substation. The existing land cover at the Grid Connection Site and in the surrounding lands was verified during surveys completed by HES and MKO and is unchanged from that described in Section 8.3.2.1.2

An assessment of the effects of the construction of the Existing Development on the land/land cover at the Grid Connection Site is presented in Section 8.5.2.1.

8.3.3 Soils and Subsoils

8.3.3.1 Desk Study

8.3.3.1.1 *Wind Farm Site*

The published Teagasc soils map (www.gsi.ie) for the local area shows that the Wind Farm Site is predominantly overlain by blanket peat (BktPT), with small local areas of mainly acidic, shallow, rock, peaty mineral soils (AminSRPT). In terms of the Existing Development, all infrastructure within the Wind Farm Site is mapped in areas of blanket peat. Other soils mapped in close proximity to the Existing Development include areas of AminSRPT soils mapped in the vicinity of the Wind Farm Site entrance.

The published subsoils map (www.gsi.ie) shows that the Wind Farm Site is underlain almost entirely by blanket peat (BktPt), with some small local areas of bedrock outcrop or subcrop (Rck) and till derived from metamorphic rocks (TMp). In terms of the Existing Development, all infrastructure is mapped to be underlain by blanket peat. Local areas of bedrock outcrop and till derived from metamorphic rocks are mapped in the vicinity of the Wind Farm Site entrance.

A subsoil geology map for the Wind Farm Site and Grid Connection Site is shown as Figure 8-1.

8.3.3.1.2 Grid Connection Site

The published Teagasc soils map (www.gsi.ie) for the local area shows that the lands in the vicinity of the Grid Connection Site are predominantly overlain by acid poorly drained mineral soils (AminPD), with blanket peat mapped in the north in the vicinity of the Wind Farm Site and in the south in the vicinity of the Clogher 110kV substation. Alluvial soils are also mapped along the Lowerymore River adjacent to the N15 National Road. Acidic poorly drained mineral soils (AminPD) are also mapped along sections of the N15 National Road.

The published subsoils map (www.gsi.ie) shows that the lands in the vicinity of the Grid Connection are predominantly underlain by metamorphic till, with blanket peat mapped in the vicinity of the Wind Farm Site and near Clogher 110kV substation. Alluvial subsoils are mapped along the Lowerymore River, while the GSI also map granite till along a section of the N15 National Road. The GSI also map areas of bedrock outcrop or subcrop in the lands surrounding the Grid Connection Site, particularly in Barnesmore Gap and with smaller pockets of bedrock outcrop mapped near Clogher 110kV substation.

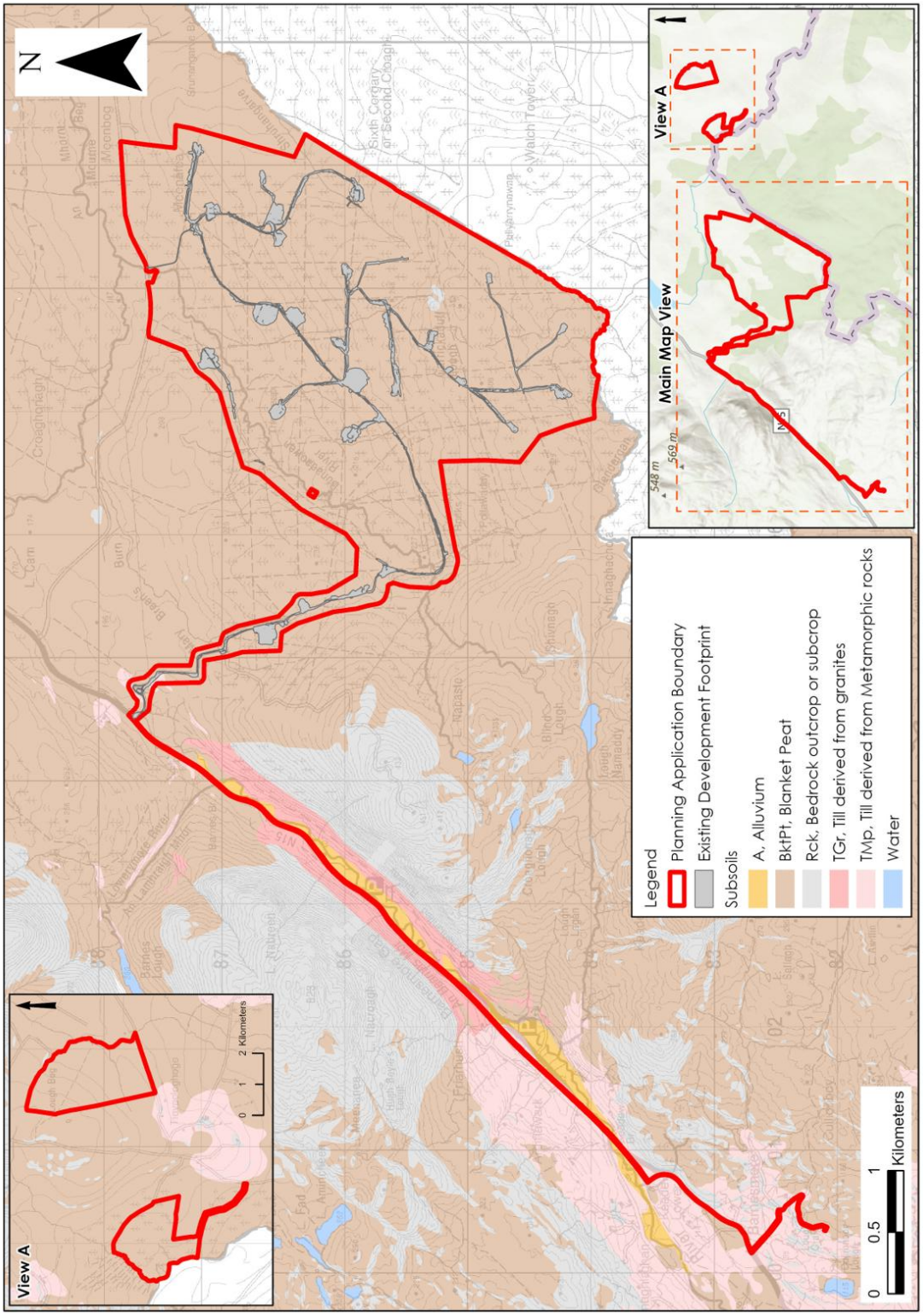

Figure 8-1: Local Subsoils Map (www.gsi.ie)

8.3.3.2 Site Investigations – Wind Farm Site

Extensive site investigations have been completed at the Wind Farm Site across multiple phases which have provided a comprehensive geological dataset.

8.3.3.2.1 *2017 EIAR: Site Investigations*

Peat Probing and Shear Vane Testing

A total of ~500 no. peat probes were completed by HES, AGEC and MKO at the Wind Farm Site as part of the baseline assessment for the 2017 EIAR. These previous site investigations showed that peat depths at the Wind Farm Site range from 0 to 5.8m with an average of 1.7m. The peat depth range distribution plot for the Wind Farm Site (Figure 8-2, reproduced from the 2017 EIAR) shows that the majority of peat depths (~73%) were between 0.5 and 2m. The areas identified as having the deeper peat deposits were located in the flatter areas of the Wind Farm Site.

The peat depths recorded at 17 of the 19 no. turbine locations varied from 0 to 2.7m with an average depth of 1.3m. At the remaining 2 no. turbines T3 and T5 maximum peat depths of between 4.5 and 4.7m were recorded. The turbines where deeper peat deposits are present have shallow slope angles typically 1 degree (1°).

With respect to the Wind Farm Site access tracks, peat depths were typically less than 2.0m with localised depths of up to 3.5m recorded. Probing was also completed along the off-road section of the Grid Connection underground cable route were average peat depths ranged from 1 – 1.25m.

AGEC also completed in-situ peat strength testing to inform the 2017 PSRA. These tests were completed at selected locations across the Wind Farm Site and at turbine locations. The results indicated shear strengths in the range of 5 to about 50kPa, with an average of about 15kPa. The AGEC report was appended to the 2017 EIAR.

HES also completed 30 no. gouge cores as part of the baseline assessment for the 2017 EIAR. These investigations have shown that the peat at the Wind Farm Site is underlain by very thin mineral subsoil or lies directly on weathered or intact bedrock. This was also consistent with observations made at several existing borrow pits and during the construction of the Existing Development infrastructure. Further details were provided in the 2017 EIAR.

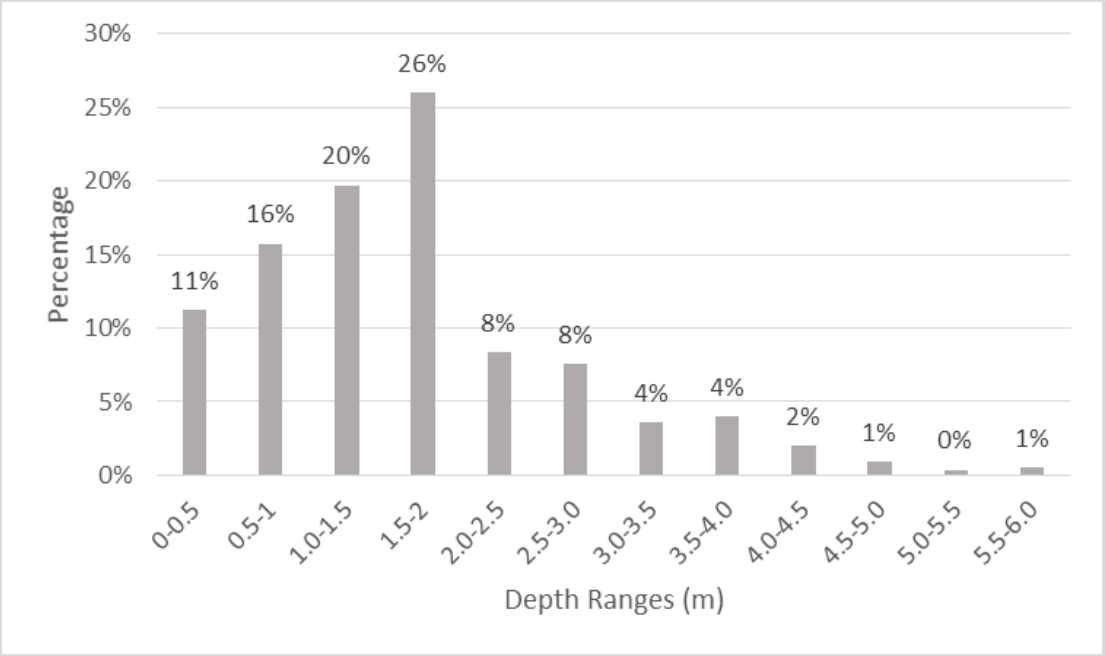

Figure 8-2: Peat Depth Distribution Plot (Combined HES, FT and MKO dataset) (reproduced from the 2017 EIAR)

8.3.3.2.2 Construction Phase: Site Investigations

During the construction phase, extensive ground investigations were completed by in order to further characterise the nature, depth and strength of the peat at the Wind Farm Site, including detailed site investigations following the November 2020 Peat Slide. These site investigations are detailed in the PSA for the Existing Development (FT, 2026), included as Appendix 8-1.

Peat Probing and Shear Vane Testing

To date approx. 3,400 no. peat probes were completed at the Wind Farm Site. The combined dataset recorded an average peat depth of 1.8m and peat depths ranging from 0 to 7.3m. Only 12% of probes recorded peat depths in excess of 3m and 1.5% of probes recorded peat depths >5m.

In general, the depth of peat was found to relate to the topographic slope angles. The areas of deep peat up to 3-6 m deep, and locally >7m, correspond to the broad flat or gently sloping ground across the central and eastern sections of the Wind Farm Site. The slope angles in these areas are typically <2°. Peat depths <2m are generally confined to the areas of steeper slopes up to 5.0-7.5°, with shallow peat <1.0m on slopes typically up to 7.5-10.0°. Peat depths of 2-3 m typically occur on the intermediate slopes of 3-5° (FT, 2026).

Hand vane shear strength test results indicate undrained shear strengths in the range of 2 to 30kPa, with an average value of about 9kPa. Note that these shear vane strength tests are lower than that which was recorded during the pre-construction site investigations, as these investigations concentrated on areas of potentially weak peat in the aftermath of the November 2020 Peat Slide. The shear vane strength test results for the upper scar of the November 2020 Peat Slide showed significantly lower results, ranging from 2 to 9kPa, with an average of slightly less than about 5kPa. There was also no notable strength gain with depth which would be typical of a saturated peat mass. These results suggest a body of very weak and saturated peat at the location of the slip scar which was not identified during the previous pre-construction site investigations. The November 2020 Peat Slide is discussed in more detail in Section 8.3.8.2.5 below.

The locations of all peat probes are shown in Figure 8-3.

Borehole Drilling

IDL drilled a total of 9 no. rotary core boreholes at various locations across the Wind Farm Site (at the substation location and at 8 no. turbine location) between 18th and 28th May 2020. These boreholes revealed the depth of the subsoil profile across the Wind Farm Site which ranged from 1.1 to 5mbgl (metres below ground level). The boreholes typically encountered thin mineral subsoils over bedrock. The subsoils were generally described as stiff dark grey micaceous SILT or subrounded to subangular fine to coarse medium assorted metamorphic GRAVEL. The borehole logs are included as Appendix A of the PSA completed for the Existing Development (FT, 2026) (Appendix 8-1). The locations of all boreholes are shown in Figure 8-4.

Monitoring Well Drilling

An additional 5 no. wells were drilled at the Wind Farm Site by Peterson Drilling Ltd under the supervision of HES in February 2025. Subsoils extended to depths of 0.4 to 3.5mbgl. The subsoils were described as peat and clay whilst some fill was encountered close to the surface as a result of the construction works associated with the Existing Development. The locations of these monitoring wells are shown in Figure 8-4.

Trial Pitting

A total of 4 no. trial pits were excavated at the Wind Farm Site on 22nd April 2021 in order to investigate in more detail the variation in peat classification and peat strengths and to retrieve peat samples for laboratory analysis. These trial pits were excavated close to T4, T5, T7 and T18, with in-situ shear vane sampling being located at each location. A peat core was also obtained at each location using a Russian Peat Sampler (RPS) (the results of the sampling is presented below – Peat Cores). The trial pits extended to a maximum depth of 1.5m and typically encountered very wet, very soft, fibrous brown peat (Acrotelm) over very soft fibrous to amorphous peat. The RPS logs provided greater detail and classified the peat at 0.5m intervals in accordance with the Von Post humification scale. The results of the trial pit investigations and the associated shear vane testing are presented in Table 4.1 of the PSA (FT, 2026) whilst the TP and RPS logs are included as Appendix A of the PSA (FT, 2026) (Appendix 8-1). The locations of all trial pits are shown in Figure 8-4.

Peat Cores

Peat core samples were also retrieved at turbine locations across the Wind Farm Site by FT using an RPS (Russian Peat Sampler) between 23rd and 27th April 2021 and all samples were logged in accordance with the Von Post classification of the degree of peat humification. Shear vane test was also carried out at each RPS location to provide shear strength data for the peat descriptions. The RPS logs from the turbine locations are included in Appendix A of the PSA (FT, 2026) (Appendix 8-1).

A total of 18 no. samples were retrieved at turbine locations and the depth of the RPS sampling ranged from 1.6m at T1 to 3.5m at T3. The degree of humification as determined from the RPS ranged from no humification (H1) within about the upper 0.5m to H9 at depth. In general, there is an increase in humification with depth, which is to be expected, though the gradation in humification with depth will tend to vary at each location depending on the terrain, drainage, and the dominant peatland vegetation. The typical range of humification ranges from H3 to H7. Below about 1.5m depth the humification is dominantly H5 or greater, which would signify a considerable amount of amorphous material is present. About half the RPS results show humification of H8 to H9 at the lower depths. Complete decomposition (H10) is considered rare, as there is invariably some more resistant fibrous material present.

8.3.3.2.3 Summary

In summary, based on the comprehensive geological dataset which has been accrued for the Wind Farm Site, the baseline subsoil geological profile is summarised as follows:

- Peat depths recorded during the Wind Farm Site walkovers and from the ground investigation ranged from 0 to 7.3m with an average peat depth of 1.8m. 65% of the probes recorded peat depths of less than 2.0m. A number of localised readings recorded peat depths from 3.0 to 7.3m; and,
- A series of trial pits have revealed that the peat is underlain by a thin layer of mineral subsoil (typically 0.1 to 0.45m thick) or weathered bedrock/bedrock.

The construction of the Existing Development has resulted in the removal and excavation of peat and spoil at infrastructure locations. To date, it is estimated that the amount of peat/spoil excavated and managed at the Wind Farm Site is 450,900m^3. The volumes of peat and spoil generated by the construction are detailed further in Section 8.4.3 below for individual elements of the Existing Development.

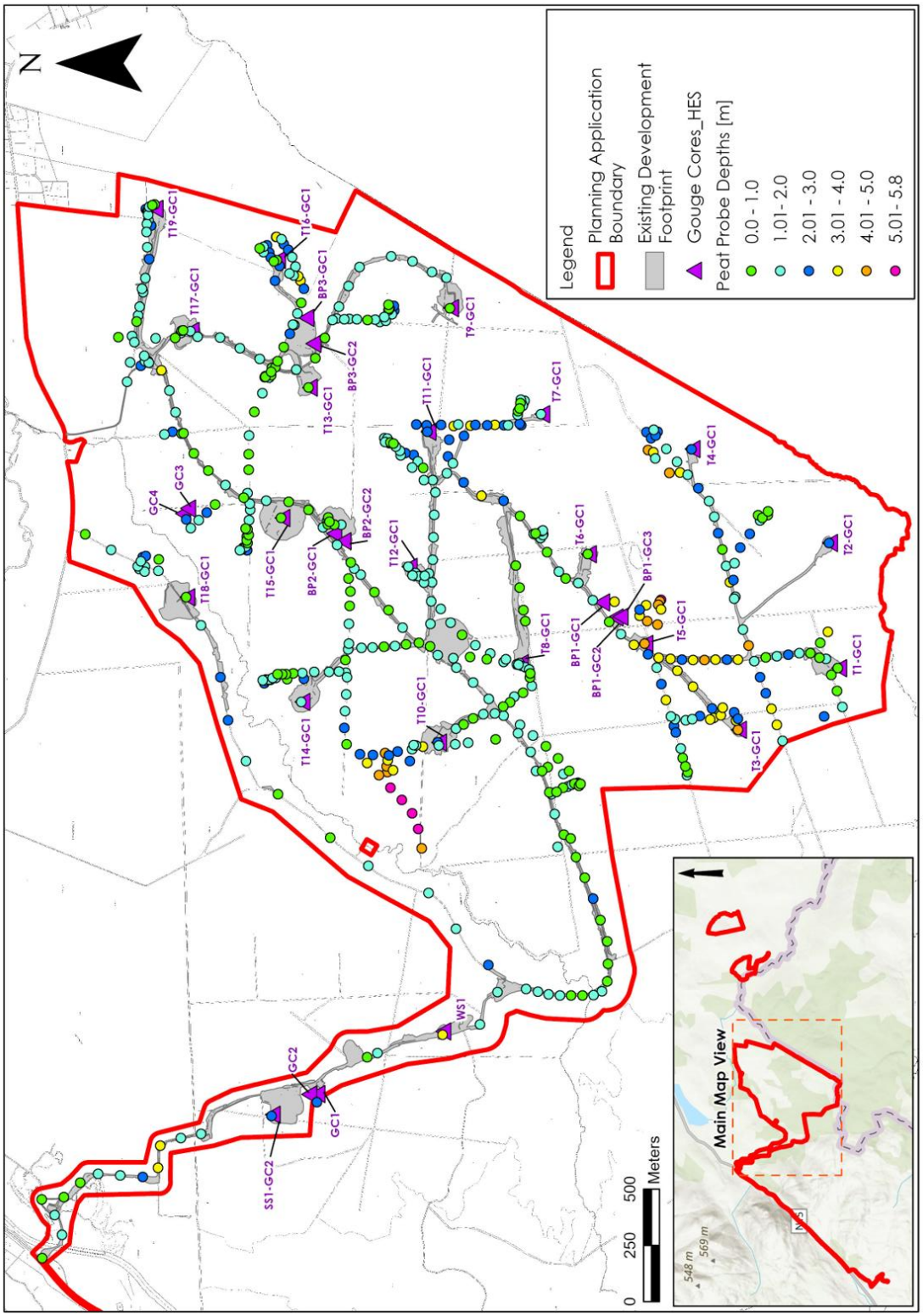

Figure 8-3: Peat Depths at the Wind Farm Site

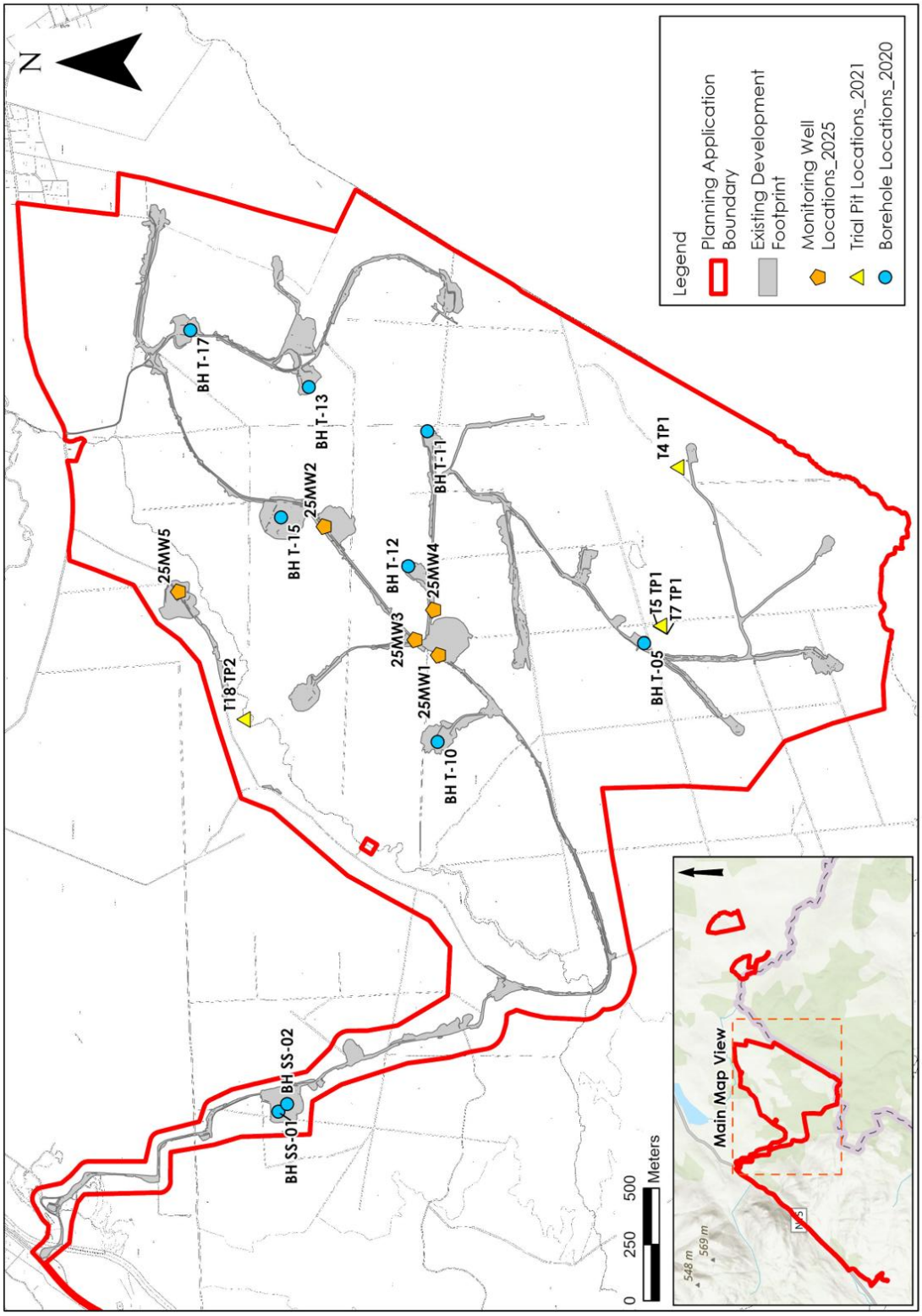

Figure 8-4: Trial Pit and Borehole Locations

8.3.4 Bedrock Geology

8.3.4.1 Wind Farm Site

Based on the GSI bedrock mapping (www.gsi.ie) the Wind Farm Site is underlain by a total of 3 no. bedrock geological formations.

Much of the Wind Farm Site is underlain by Lough Eske Psammite Formation comprising of feldspathic psammite, quartzite and marble. The southern section is underlain by the Lough Mourne Formation which is noted to comprise of coarse and feldspathic pale pink psephites in a pale green chloritic matrix. A small area in the west, at the Wind Farm Site entrance, is underlain by the Barnesmore Granite. The Wind Farm Site is underlain by 1 no. mapped structural geological feature. A northeast-southwest orientated fault, referred to as the Barnesmore Fault, is mapped in the vicinity of the Wind Farm Site entrance. A bedrock geology map is shown as Figure 8-5 below.

The GSI map several areas of bedrock outcrop within the Wind Farm Site. This is supported by the site investigations and field observations which revealed the occurrence of shallow bedrock across the Wind Farm Site.

Bedrock is currently exposed at a number of existing borrow pit and road cuttings across the Wind Farm Site, and these exposures generally confirm the mapped geology as outlined above. The bedrock in these exposures was typically noted to be massive and very competent with a thin upper weathered zone at some locations.

Borehole drilling has been completed at the Wind Farm Site during the construction of the Existing Development. A total of 9 no. boreholes rotary core boreholes were drilled by IDL at various locations across the Wind Farm Site (at the substation location and at 8 no. turbine location) between 18th and 28th May 2020. The depth to bedrock during these site investigations was noted to range from 1.1 to 5.0mbgl. The rock was typically described as very strong thinly foliated bluish to greenish grey fine to medium grained PHYLLITE. The logs associated with these boreholes are included as Appendix A of the PSA (FT, 2026) (refer to Appendix A of Appendix 8-1).

An additional 5 no. wells were drilled at the Wind Farm Site by Peterson Drilling Ltd under the supervision of HES in February 2025. Bedrock was encountered at depths of 0.4 to 3.5mbgl. The bedrock was described as medium strong grey SCHIST underling weak weathered SCHIST. The borehole logs associated with these site investigations are included as Appendix 8-3. These locations of these wells are shown in Figure 8-4 above.

It is noted that the varying descriptive terminology used in the borehole logs (i.e. phyllite and schist) is considered to reflect differences in geological logging interpretation and drilling methodology. Several boreholes were completed using downhole techniques, which yield limited intact material and consequently constrains detailed geological classification. Furthermore, the bedrock at the Wind Farm Site comprises of a metamorphic sequence in which gradational contacts may occur between phyllite and schist. The description of the bedrock encountered on-site correlates with the bedrock formations mapped at the Wind Farm Site and Grid Connection Site by the GSI.

The construction of the Existing Development resulted in the removal and excavation of bedrock at some infrastructure locations and from borrow pits. To date, it is estimated that the amount of excavated at the Wind Farm Site is 457,027m^3. Please refer to Section 8.4.2 for further details regarding the volumes of bedrock extracted at the Wind Farm Site.

8.3.4.2 Grid Connection Site

The northern section of the Grid Connection Site is mapped by the GSI to be underlain by the Lough Eske Psammite Formation. As it passes through the Barnesmore Gap the Grid Connection Site is

mapped to be underlain by the Barnesmore Granite. Further to the south, the Grid Connection Site is mapped to be underlain by the Lough Mourne Formation which consists of quartz and feldspar pebbles in a green matrix.

A large northeast to southwest orientated fault, known as the Barnesmore Fault, is mapped to the east of the Grid Connection Site. The GSI also map a tertiary dolerite dyke in the vicinity of the Grid Connection Site in the townland of Barnesmore and ~400m to the north of Clogher 110kV substation.

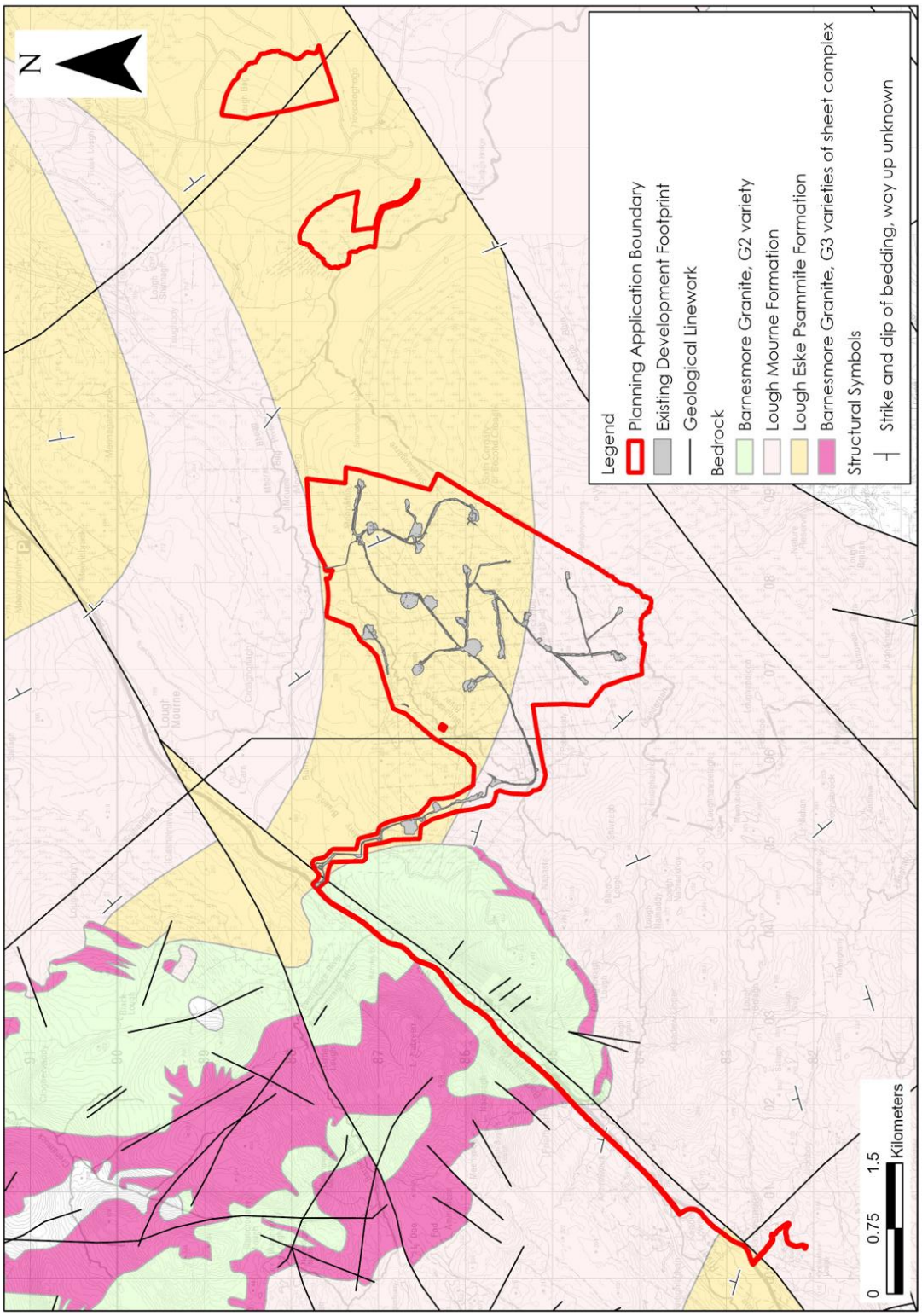

Figure 8-5: Bedrock Geology Map

8.3.5 Geological Resource Importance

8.3.5.1 Wind Farm Site

The GSI Online Database accessed via the Public Data Viewer (www.gsi.ie) does not record the presence of any active quarries or pits within the Wind Farm Site. The closest mapped active quarry is Kiltole Quarry, near Strabane, located ~18.5km to the northeast.

A historic sand and gravel pit is mapped within the Wind Farm Site, immediately to the northeast and southwest of the existing site entrance. This pit is recorded as being active between 1975 and 1995. An application for substitute consent for this quarry is currently with An Coimisiún Pleanála (Planning Reference 318022).

The GSI record several mineral localities to the west of the Wind Farm Site (www.gsi.ie). The presence of gravel is recorded near the Wind Farm Site entrance in the townland of Cashelnavean. The presence of sand and gravel is also recorded at several other localities in the vicinity of the N15 National Road along the Barnesmore Gap. Several occurrences of uranium have also been reported to the west of the N15 National Road, associated with the Barnesmore Granite.

The GSI online Aggregate Potential Mapping Database (www.gsi.ie) shows that the crushed rock aggregate potential of the Wind Farm Site ranges from Very Low to High. Much of the Wind Farm Site is mapped as having Low to Moderate potential with only localised areas of high potential. The bedrock at the Wind Farm Site could be used on a "sub-economic" local scale for construction purposes. The bedrock has been used previously to facilitate the construction of the Existing Development, with borrow pits now present at the Wind Farm Site.

The vast majority of the Wind Farm Site is not located within an area mapped for granular aggregate potential (i.e., potential for gravel reserves). However, an area in the west is mapped as having Very High potential for gravel reserves in the vicinity of the Wind Farm Site entrance.

The peat and subsoil deposits at the Wind Farm Site can largely be considered to be of "Low" importance due to the largely thin occurrence, given the fact that peat is not designated in this area and is significantly degraded in most places as a result of forestry plantations and associated drainage.

8.3.5.2 Grid Connection Site

There are no active quarries or active sand and gravel pits mapped in the vicinity of the Grid Connection Site (www.gsi.ie).

The GSI do map the occurrence of several mineral localities along and adjacent to the Grid Connection Site as it passes through Barnesmore Gap. These relate to gravel and sand and gravel deposits in the townland of Cashelnavean. These deposits are of fluvio-glacial origin.

The GSI online Aggregate Potential Mapping Database (www.gsi.ie) shows that the crushed rock aggregate potential at the Grid Connection Site ranges from Very Low to High. The vast majority of the Grid Connection Site is mapped in areas of Very Low or Low potential. The greatest potential is found in the south of the Grid Connection Site in the townlands of Keadew Lower, Keadew Upper and Cullionboy.

Areas of granular aggregate potential are mapped in the vicinity of the Grid Connection Site along the N15 National Road. The greatest potential (Very high) is found in the north, adjacent to the Wind Farm Site. Further to the southwest, Very Low to Low granular aggregate potential is mapped along the Lowerymore River adjacent to the Grid Connection Site.

8.3.6 Geological Heritage Sites

8.3.6.1 Wind Farm Site

A small area in the west of the Wind Farm Site is located within the Barnesmore Gap County Geological Site (CGS) (Site Code: DL002). This CGS is recommended as a geological Natural Heritage Area (NHA) and is described as a deep mountain pass running northeast-southwest between Croaghconnellagh and Barnesmore mountains. It is of geological importance due to excellent exposures of glacial channels and moraines. Within the Wind Farm Site ~1.2km of Wind Farm Site access roads are located within or immediately adjacent to this CGS.

There are no other Geological Heritage Sites within 5km of the Wind Farm Site.

8.3.6.2 Grid Connection Site

Approximately ~3km of the Grid Connection Site along the N15 National Road is mapped in the Barnesmore Gap CGS.

Further to the south, approximately 1.2km of the Grid Connection Site (at the Clogher 110kV substation) are mapped in the Donegal and Inver Bays CGS which is also recommended for designation as a Geological NHA. This CGS is described as a large area of rolling countryside forming the hinterland around Donegal and Inver Bays. The GSI state that this is one of the finest fields of ribbed moraines and drumlins in the country.

Other Geological Heritage Sites are mapped within 5km of the Grid Connection Site include:

- Edergole CGS (Site Code: DL014) is located ~4km to the northwest of the Grid Connection. This CGS is recommended for designation as a Geological NHA and comprises of a Moorland site to the north of Lough Eske with outcrop along the Corabber River; and,
- Clady River CGS (Site Code: DL007) is located ~4km to the west of the Grid Connection and to the west of Lough Eske. This CGS comprises of outcrops in the bed and banks of the Clady River.

A map of local Geological Heritage Sites is shown as Figure 8-6.

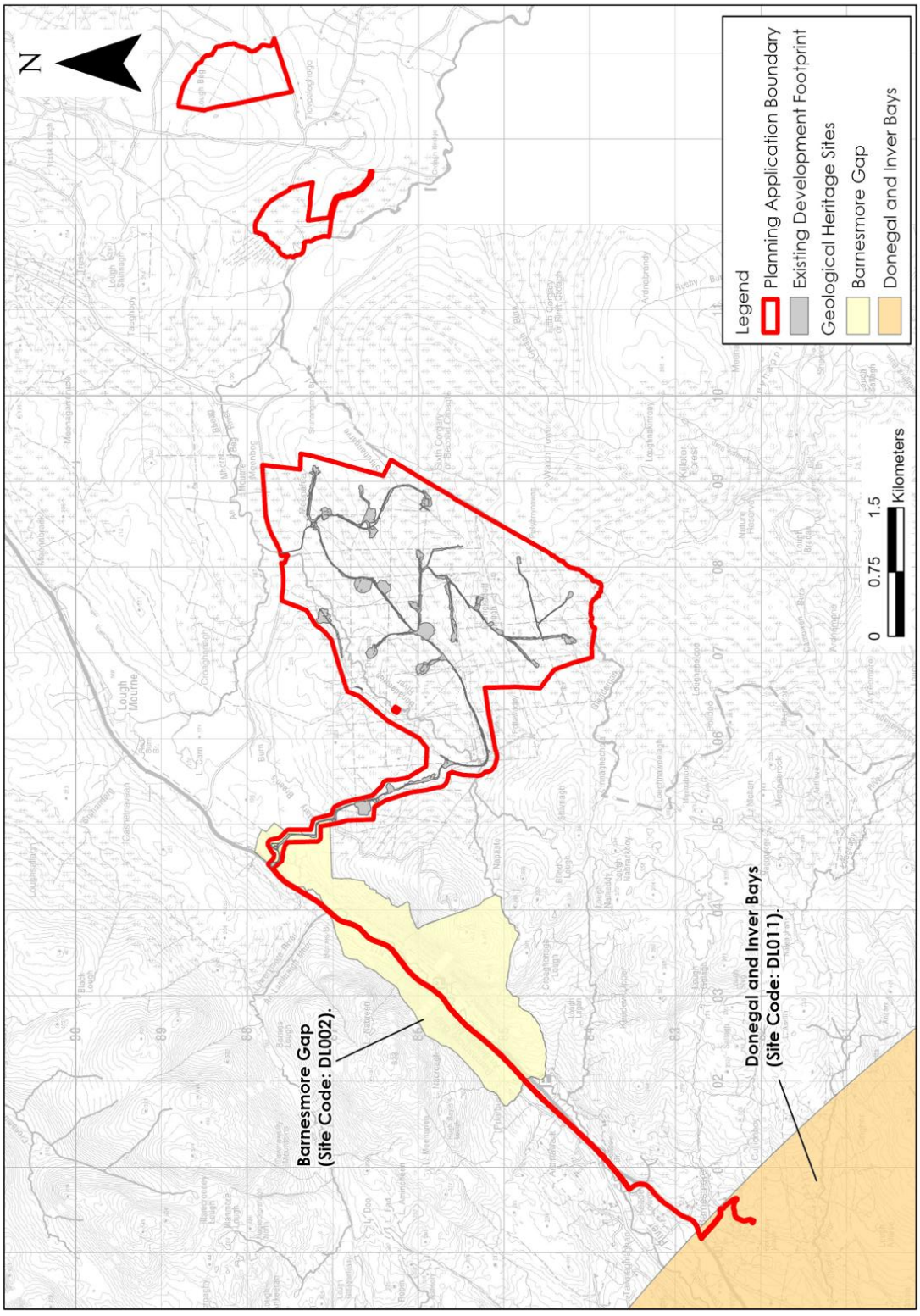

Figure 8-6: Geological Heritage Sites

8.3.7 Soil Contamination

There are no known areas of soil contamination within the Wind Farm Site or the Grid Connection Site. During site walkovers and site investigations, no areas of contamination concern were identified within the Wind Farm Site and Grid Connection Site. Several borrow pits associated with the Existing

Development are located within the Wind Farm Site however no contaminated tailings were recorded during the site walkover surveys.

According to the EPA online mapping (www.epa.ie), there are no licensed waste facilities or dump sites located within or in the vicinity of the Wind Farm Site or the Grid Connection Site.

There are no historic mines at or in the immediate vicinity of the Wind Farm Site or the Grid Connection Site that could potentially have contaminated tailings.

8.3.8 Peat Stability

8.3.8.1 Desk Study

Wind Farm Site

The GSI record the occurrence of 1 no. landslide within the Wind Farm Site (www.gsi.ie). This event dates from 12th November 2020 and occurred during the construction of the Existing Development. This peat slide and the subsequent site inspections are discussed in Section 8.3.8.2.5 below.

The GSI also record an additional historic landslide event to the west of the Wind Farm Site. This event dates from 1963 with the GSI stating that a road cutting was a contributing factor to this historic landslide event (www.gsi.ie).

The GSI Landslide Susceptibility Map (www.gsi.ie) classifies the probability of a landslide occurring based on the soil type and the slope. The landslide susceptibility of the Wind Farm Site is classified by the GSI (2023) as ranging from "low" to "high" susceptibility, with the higher risk areas corresponding to steeper slopes within the Wind Farm Site.

In terms of the Existing Development, the majority of the infrastructure is mapped in areas of low to moderately low susceptibility. This map is to the scale of 1:50,000 and is therefore superseded by site-specific stability assessments.

Grid Connection Site

The GSI record the presence of an historic landslide event ~400m to the southeast of the Grid Connection Site as it passes through Barnesmore Gap.

The GSI Landslide Susceptibility Map (www.gsi.ie) shows that the Grid Connection Site is predominantly mapped in areas low landslide susceptibility. Some areas of moderately high susceptibility are mapped near Clogher 110kV substation and near the Wind Farm Site entrance. The onsite 110kV substation is mapped in an area of moderately low susceptibility. Meanwhile, some areas of high susceptibility are mapped in the surrounding lands as the Grid Connection underground cable route travels along the N15 National Road through the Barnesmore Gap.

8.3.8.2 Existing Development Peat Stability Risk Assessment

8.3.8.2.1 *Preamble*

All data and stability assessments presented in this section are summaries of the appended reports as referenced. As such, this section provides summaries only for the purpose of impact assessment. All conclusions regarding site stability, historic and future, are rooted in the referenced and appended reports (Appendix 8-1 and Appendix 8-2).

8.3.8.2.2 *Introduction*

A Peat Stability Assessment (PSA) was completed for the Existing Development by FT (2026). This report is attached as Appendix 8-1.

This PSA was completed following the principles in Peat Landslide Hazard and Risk Assessments (PHLRA): Best Practice Guide for Proposed Electricity Generation Developments (Scottish Government, 2017).

The following sources of information were used by FT to assess the peat stability:

- Published records (for example GSI and GSNI landslide databases);
- Historical aerial photography;
- Observations from site inspections in November and December 2020, January 2021, December 2024, and April 2025;
- Ground investigation data (peat strength and depth) at selected locations (2017-2025);
- Detailed site inspections of the November 2020 Peat Slide;
- Planning and design reports;
- Construction records; and,
- Drone survey data.

8.3.8.2.3 *Walkover Surveys and Site Investigations*

The PSA (FT, 2026) is informed by the extensive and comprehensive site-specific geological dataset which has been accrued over several phases of site investigations. Approx 3,400 no. peat probes have been completed at the Wind Farm Site.

From these investigations, both pre- and during construction, the peat depths ranged from 0 to very locally 7m with an average peat depth of 1.8m (FT, 2026). The majority of peat depths (~65%) were less than 2m. Hand vane shear strength test results indicate undrained shear strengths in the range of 2 to 30kPa, with an average value of about 9kPa. In general, the depth of peat is proportional to the slope angles. The areas of deep peat up to 3-6 m deep, and locally >7.3m, correspond to the broad flat or gently sloping ground across the central and eastern sections of the Wind Farm Site. The slope angles in these areas are typically <2°. Peat depths <2m are generally confined to the areas of steeper slopes up to 5.0-7.5°, with shallow peat <1.0m on slopes typically up to 7.5-10.0°. Peat depths of 2-3 m typically occur on the intermediate slopes of 3-5° (FT, 2026).

Gouge cores and window sampling show that the peat is generally underlain by a thin layer of mineral subsoil or intact competent bedrock. The thickness of the mineral subsoil typically ranged from 0.1 to 0.45m (FT, 2026).

8.3.8.2.4 Baseline Peat Stability Risk Assessment (Original Site Conditions)

Quantitative Peat Stability Analysis (Baseline)

The peat stability assessment analysed the stability of the natural peat slopes for individual areas of the Wind Farm Site, including at turbine locations and along access roads.

The purpose of the analysis was to determine the 'Overdesign' factor (ODF) of the peat slopes using infinite slope analysis. The analysis was carried out at the turbine locations, along the access roads and at various locations across the Wind Farm Site. The 'Overdesign' factor is a measure of the stability of a particular slope, with higher values indicating greater stability; a minimum value of 1.0 is required to confirm stability, in accordance with Eurocode 7, allowing for the in-built partial material and load factors.

For the stability analysis, 4 no. load conditions were examined:

- Condition (1): no surcharge loading;
- Condition (2): surcharge of 10kPa, equivalent to 1m of stockpiled peat. In localised cases this has been increased to 15kPA or 20kPa where records indicate that 1.5 or 2m of peat was sidecast;
- Condition (3): surcharge of 23kPa, equivalent to 1.15m thick access road (analysed for the drained condition in areas of floating road construction). Applies to the access roads to T1-T4; and,
- Condition (4): surcharge of 23kPa for the floating road location plus an additional 20kPa live loading for construction traffic. Applies to the access roads to T1-T4.

Undrained Analysis

An undrained analysis was carried out, which applies in the short-term during construction. The undrained analysis for load condition 2 is considered the most critical load case as most peat failures occur in the short term upon loading of the peat surface. This would have been the case immediately after construction of the infrastructure across the Wind Farm Site. The results from the main infrastructure locations, including along access roads and in areas of peat placement, are summarised below.

The calculated ODF for load condition 1 is in excess of 1.0 for all of the 1,320 locations analysed (see rPSMP in Appendix 4-8 of this rEIAR) with a range of FoS of 1.03 to 223.21, indicating a low to medium risk of peat instability.

The calculated ODF for load condition 2 is in excess of 1.0 for 1,307 of the 1,320 locations analysed with a range of ODF of 1.00 to 123.15, again indicating a low to medium risk of peat instability. 13 no. locations (1% of all locations analysed) had results of between 0.89 and 0.99. Four of these locations are in areas where no infrastructure was constructed. Another five locations were recorded along founded sections of access road, along with one location within the borrow pit, where the peat is not loaded and therefore is not at risk of failure. These results occurred in areas where the slope was greater than 7 degrees, or on shallower slopes with deeper peat (>3.5m), or a combination of both of these factors. The remaining three locations are located at T6 (ODF of 0.95), upslope of T7 (ODF of 0.84), and upslope of the founded road between T5 and T6 (ODF 0.88). No loading of the peat has occurred at any of these 3 no. locations.

The calculated ODF for load condition 3 is in excess of 1.0 for 85 of the 88 (96.5%) locations analysed with results ranging from 0.85 to 13.51. Three results of less than 1.0 were recorded on the floating road to T4. Two of these locations are close to the junction with the road to T1 and one is 200m west of the hardstand at T4. No peat failures have occurred in these areas. As a check, a slope stability analysis using SlopeW software was undertaken for the areas which indicated the potential for stability (i.e.

ODF<1). The results from this analysis returned an ODF result of 1.27 close to T4 and 1.24 at the junction to T1 and 1.05 along the floating road to T1.

The calculated ODF for load condition 4 (floating road assessment) is in excess of 1.0 for 78 of the 88 (88.6%) locations analysed, with results ranging from 0.77 to 11.77. Ten results of less than 1.0 were recorded on the floating road to T4, six of them close to the junction with the road to T1 and four close to the hardstand. No peat failures have occurred in any of these areas. As a check, a slope stability analysis using SlopeW software was undertaken for the areas which indicated the potential for stability (i.e. ODF < 1). The results of this analysis returned an ODF of 1.04 for the T1/T4 Junction and an ODF of 1.06 for the access road to T4.

Table 8-4: Factor of Safety Limits for Slopes.

Factor of Safety	Degree of Stability
Less than 1	Unstable
1.0 or greater	Acceptable

Baseline Peat Stability Risk Assessment (Original Conditions)

A baseline Peat Stability Risk Assessment (PSA) has been carried out for the Wind Farm Site to characterise the relative risk of peat instability in defined zones across the Wind Farm Site, relating to the area around each turbine, and to sections of floating roads, prior to construction of the Meenbog Wind Farm. This assessment was undertaken for baseline conditions in 2019 and the current Wind Farm Site conditions in 2026. The purpose of the PSA is to identify where there are elevated risk factors that determine where mitigation measures are required to ensure that the risk of peat instability can be reduced to an acceptable level for each site activity.

A qualitative risk assessment has been carried out for each zone to assess the Risk Rating for a peat slide based on the interpreted Likelihood (i.e. probability) of occurrence and Impact of failure. The results are presented in Section 5.3 of the PSA (Appendix 8-1). The assessment identifies several areas close to turbines/hardstands and along floating access roads where the Risk Rating prior to mitigation is characterised as Medium to High (R=20), which is classified as unacceptable without mitigation. These zones occur where there is an elevated risk due to deposits of deep (>3m), weak peat (<4kPa), areas adjacent to previous slides that have similar characteristics or areas of floating roads.

In the remaining areas, the Risk Rating prior to mitigation would have been Medium which would only require early attention with appropriate mitigation measures to reduce the risk of peat instability. These were in areas with mitigating condition that reduced the baseline risk of instability due to shallow peat, gently sloping ground and areas will well developed drainage.

The PSA (FT, 2026) states that although the baseline PSA identifies that there are areas of the Wind Farm Site that had a high initial risk of peat instability prior to implementing appropriate mitigation measures, based on our current experience with managing peat stability under similar conditions it would not be considered an abnormal or exceptional risk for a wind farm project on an upland blanket bog in Ireland.

Design Construction Details and Mitigation Measures

Effective design, construction and operational risk mitigation measures and improvements in site conditions were used to reduce the Likelihood of a peat slide to a low or negligible level, even in higher-risk zones.

- Use of founded access roads across the majority of the Wind Farm Site (17.8km from a total of 20.4km) to reduce the area of peat loaded by construction works.

- Civil works undertaken by an experienced earthworks and civil contractor.
- Inspection of areas identified for sidecasting by a suitably qualified person to confirm the suitability of the areas for this use.
- A basal layer of brash and small trees and a layer of geogrid reinforcement were incorporated into the design of the floating roads to minimise the thickness of granular rockfill used to construct the roads, and to spread the dead load of the road evenly over the surface of the intact peat.
- Ground Investigation – Extensive peat probing, in-situ vane shear testing to characterise the depth, strength and material characteristics of the peat.
- Peat excavated from the turbine foundations sidecast on the intact peat slopes adjacent to the
- excavations was spread out over the surface of the peat, generally to a depth of 0.5-1.5m, to minimise the dead load surcharge and distribute it over a wide area.
- Where large peat cells were required, a granular bund was constructed to retain the placed peat, with appropriate drainage installed through the berms to allow the placed peat to drain and consolidate.
- Regular monitoring of deep peat areas.
- Restrictions on work during or after periods of heavy or sustained rainfall. Heavy intense rainfall can result in degradation of the works resulting in localised instability, and in extreme cases can trigger large-scale peat failure.

8.3.8.2.5 *Peat Failures During Construction*

Minor Peat Failures During the Construction Phase

Some small and localised peat failures occurred at the Wind Farm Site during the construction of the Existing Development. These failures were generally small and remained within the boundary of the Wind Farm Site.

It is considered that a key contributory factors (refer to Table 8-5) to these failures was excavated arisings being placed on to the insitu peat surface, particularly on the downslope side of access roads on peat (FT, 2026). The likely cause of failure was excessive loading causing undrained shear failure of the underlying peat leading to progressive downslope failure (FT, 2026). Particular mitigation measures were implemented to ensure that these working practices were prevented from re-occurring.

The effects of these failures were significantly less than that associated with the November 2020 Peat Slide which is discussed below.

Table 8-5: Summary of Likely Causes of Peat Failures During the construction phase (adapted from FT, 2026 – Table 6.1 of the PSA)

Peat Failure Reference No.	Location	Ground Conditions	Likely Cause
1	Peat failure at previously proposed BP between T5 and T6	Peat depth of 3m with some exposed mineral soil and shallow rock	Excessive excavated peat being placed on in situ peat resulting in an undrained loading failure of in situ peat. Failure travelled only a short distance.

Peat Failure Reference No.	Location	Ground Conditions	Likely Cause
2	Peat failure at BP between T5 and T6	Assumed to be similar to peat failure reference 3.	Excessive loading due to surcharging of failed debris (1) from previous failure. Downslope run-out distance controlled by forestry furrows.
3	Peat failure at BP between T5 and T6	Peat depth varied from 0.2 to 1.9m. Shear strength varied from 3kPa to 20kPa, with an average of 6kPa.	Excessive loading of arisings on the downslope side of access road causing undrained shear failure. Downslope run-out distance controlled by forestry furrows.
4	Failure at T12	Peat depth varied from 1.5 to 2m. Peat strength varied from 8kPa to 15kPa.	Excessive loading of arisings on the downslope side of access road. Downslope run-out distance controlled by forestry furrows.
5	Minor instability at T5	Peat depth varied from 2.6 to 3.7m. Peat strength varied from 4kPa to 7kPa.	T5 excavations which initiated a translation slide within adjacent peat upslope with the onset of tension cracks. Construction of the turbine bae and infilling of excavation stabilised the peat.
6	Minor instability at T16	Peat depth of 1.4m. Peat strength <4kPa.	Loading of the excavated peat onto the peat surface from a perimeter drain combined with undercutting of peat slope.
7	Minor instability S-bends roadworks	Not known	Excessive loading of placed material on peat causing undrained shear failure.

November 2020 Peat Slide

On 12th November 2020, during the construction of a permitted access road to T7, a significant peat failure occurred at the Wind Farm Site. The works that were underway at the time in the area where the peat slide occurred, were fully permitted and were being undertaken in line with the project design that had been subject to both Environmental Impact Assessment (EIA) and Appropriate Assessment (AA). A detailed description of the peat failure and the likely mechanism of the failure is provided in the FT report "Meenbog Wind Farm – Assessment of Site with respect to Peat Stability" (FT, 2021) (Appendix 8-2).

Following the November 2020 Peat Slide, the Environmental Protection Agency (EPA) took the lead to ensure that the necessary follow-up investigations were completed and that any required remediation measures were implemented. The EPA engaged the services of ARUP Consulting Engineers, to advise and represent the EPA on the geotechnical and peat stability aspects of the follow-up investigations.

Fehily Timoney and Company (FT) completed a Peat Stability Assessment of the Wind Farm Site in August 2021 (Appendix 8-2). The assessment was prepared for the purpose of complying with the EPA's Direction under Regulation 8(1)(b) of the European Communities (Environmental Liability) Regulations 2008. The assessment was completed in accordance with the guidance in the Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Development (PLHRA, 2017). Prior to completion, the report was revised to address all issues which arose following several consultations with the EPA. The FT report comprised a site-wide stability assessment, including an overview of the ground conditions at the Wind Farm Site, site investigations, an assessment of the constructed works, a review of the November 2020 Peat Slide and a qualitative assessment of peat stability. The FT 2021 report is attached as (Appendix 8-2) and is summarised below.

The November 2020 Peat Slide failure site comprises of upper and lower peat scars. The upper scar, the primary source of the failed material, is located on a flat plateau and has an area of ~2.4ha. The lower scar is rectilinear, ~260m long and ~43m wide, and follows the slope gradient. The head of the lower scar started at the downslope mouth of the upper scar, with the lateral boundaries of the lower scar following pre-existing forestry furrows. The lower scar has an area of ~1.18ha. The total volume of the failure is estimated to be 86,240m^3 (FT, 2021; FT, 2026)).

The ground conditions at the failure site have been summarised by FT (2021 and 2026) as follows:

- Blanket peat ranging in depth from 1.5 to >3.5m, with the upper scar having notably deeper peat (average of 2.7m) than the lower scar (average of 1.8m);
- Peat strength in the upper scar ranged from 2 to 19kPa, with an average of 6kPa. The higher vane results in the upper scar are typically at the interface of the base of the peat with the underlying mineral soil, or where roots have caught the vane. If these higher results are ignored, then the undrained shear strength ranges from 2 to 9kPa, with average reducing to slightly less than about 5kPa. (note that these results are significantly lower than the site-wide results and would represent a body of very weak peat);
- Peat is underlain by mineral soil (glacial till) or weathered rock; and,
- Bedrock was observed in the floor of the lower scar. In situ testing indicate that around the upper scar bedrock may directly underlie the peat.

The FT (2021) (Appendix 8-2) report provides a number of key contributory factors, and state that for the failure to occur all or at least most of these factors were required to be present. These are notably different from the contributory factors described for the earlier failures at the Wind Farm Site described in the preceding section. The factors summarized by FT are as follows:

- Construction of a floating road;
- Body of very weak, saturated peat upslope of the floating road. This body of weak peat relied for lateral stability on the peat slope upon which the floating road was being constructed;
- Preceding heavy rainfall since June 2020 which was itself preceded by a dry spell in April and May which would have caused shrinking and cracking of the surface acrotelm peat layer. These cracks would have provided a pathway for subsequent rainfall to ingress into the peat body at depth;
- Drainage and surface water ingress into the peat. Drainage ditches in the forestry plantations directed surface water runoff towards the area of very weak peat;
- Topography – the failure initiated at a convex slope, at the location of the floating road; and,
- Downslope felled forestry on peat comprised of furrows and drains and the failure exploited the existing furrows which are lined of weakness as they have a severed acrotelm layer.

8.3.8.2.6 *Inspection of Existing Development Works*

AFRY Site Inspection (2023)

AFRY Ireland Ltd (formerly Ionic) completed a site inspection of the Wind Farm Site on 19th October 2023 to assess the overall stability of the Meenbog Wind Farm from a geotechnical perspective and to assess whether there had been any instability since the 2021 stability assessments.

The Technical Note arising from this site inspection found no evidence of movement at turbine locations or along access roads. Inspections of the borrow pit and peat cell berm walls indicated that these were in good condition with no visible signs of distress. The Technical Note concluded that:

> "*the overall site is currently stable based upon our assessment of the roads, hardstanding's, borrow pits, peat storage areas and peat stabilisation areas*".

FT Visual Assessments

FT completed detailed inspections in January 2021, December 2024 and April 2025 at all construction works areas. The observations made during these site visits are presented in FT's 2026 PSA for the Existing Development. Based on visual observations the floating roads showed no evidence of instability with no apparent signs of incipient peat failure. Furthermore, FT note that the floating roads show signs of ongoing settlement which will improve stability over time due to the consolidation of the underlying peat over time (FT, 2026).

With respect to the turbine hardstands, no evidence of instability was recorded. The earlier 2021 site visit noted some small slips/slumps near T16, T5 and T19 but works have been completed at each of these locations to ensure that there is no risk of instability (FT, 2026).

8.3.8.2.7 *Peat Stability Risk Assessment (Existing Development)*

A quantitative assessment of the stability of the Existing Development is presented in Section 8 of the PSA. The undrained analysis applied during the construction period, for the current site conditions where no construction is ongoing, the drained assessment is more relevant. This analysis did not include hardstands or founded roads as all peat has been removed from these locations.

This assessment shows that the works constructed to date have an adequate ODF and are currently considered to be stable. All sections of floating roads returned an ODF value >1 for the drained condition. Similarly, all side cast areas, borrow pits, peat cells and berms returned an ODF >1 for the drained condition.

A qualitative peat stability risk assessment has also been undertaken for the turbine locations and the sections of floating road constructed across the Wind Farm Site. The majority of locations are currently assessed as Low risk, with a slightly higher risk (Low to Medium) associated with the area around T7 and on the floating roads. The low risk is associated with the implementation of the appropriate mitigation measures and the improved site conditions, due to an increase in peat strength below the floated roads, improved drainage, drying out of peat within peat cells and borrow pit areas.

8.3.8.2.8 *Summary of FT 2026 PSA*

The PSA (FT, 2026) concludes that the following an assessment of the Wind Farm Site with respect to peat stability it is considered that the as constructed works associated with the Existing Development are currently stable. The highest risk was at the time of construction in 2019 and 2020, and recent inspections and investigations have confirmed that there is no apparent issue with peat instability for the existing development in its current condition. While the stability of the Wind Farm Site may change

due to natural processes (such as intense rainfall events) over time, there is not currently considered to be an ongoing risk of peat failure on the Wind Farm Site from the Existing Development.

8.3.9 Receptor Importance and Sensitivity

This section discusses the sensitivity of the receiving land, soils and geological environment in terms of the Existing Development and identifies those sensitive receptors which will be carried forward into the retrospective impact assessment.

Based on the criteria set out in Table 8-2 above, the soils and peat at the Wind Farm Site and the Grid Connection Site can be classed as being of low importance as the overlying peat deposits are not designated in this area. Furthermore, prior to the construction of the Existing Development the soils at the Wind Farm Site were significantly degraded as a result of the commercial forestry operations.

The bedrock geology underlying the Wind Farm Site and the Grid Connection Site can be classed as being of medium importance where the bedrock could be used on a sub-economic scale.

The Barnesmore Gap CGS in the west of the Wind Farm Site and the Donegal and Inver Bays CGS along the Grid Connection can be considered as being of high importance due to their designations as county geological heritage sites.

Based on the preceding desk study, site investigations and characterisation of the baseline environment, the following receptors will be included in the remedial impact assessment:

- The land at the location of the Existing Development;
- The peat, soils and subsoils at the location of the Existing Development;
- The underlying bedrock geology;
- Peat stability at the Wind Farm Site;
- The Barnesmore Gap CGS; and,
- The Donegal and Inver Bays CGS.

8.4 Characteristics of the Existing Development

The Existing Development is described in full in Chapter 4 of this rEIAR.

The Existing Development comprises of all works completed at the Wind Farm Site and Grid Connection Site from November 2019 to the present day.

In summary the Existing Development consists of the following:

- Upgrades of 13.7km of roadways (including upgrades of founded rounds (4.1km), upgrade of existing floating road (0.72km), upgrade of 8.9km of floating road to a founded road);
- Construction of 3km of new founded roads and 2.3km of new floating roads;
- Ground works relating to 18 turbines;
- 16 fully and partially completed turbine foundations;
- 110 kV Substation and underground grid connection;
- Internal wind farm cabling and ducting;
- Temporary construction compounds;
- Peat Storage areas;
- Borrow pits;
- Forestry felling;
- Drainage works and sediment control measures; and,
- Construction of mitigation measures for ecological risk.

Construction of the Existing Development commenced in November 2019. The majority (>90%) of construction activity associated with construction of wind farm infrastructure took place during a 12-month period from November 2019 to November 2020, with works along the Grid Connection continuing until early 2021. A timeline for the construction phase is presented in Table 4-8 of this rEIAR.

All works were completed in accordance with the 2019 CEMP for the Permitted Development. The CEMP also detailed emergency response procedures to be followed in the event of a peat slide and these measures were implemented following the November 2020 Peat Slide.

Ongoing activities associated with the Existing Development are limited to periodic maintenance of the substation, site tracks, and sediment and erosion control measures as well as environmental monitoring. The Existing Development has been confirmed as stable, from an environmental perspective and safe from a Health and Safety perspective.

8.4.1 Peat and Spoil Management

A Peat and Spoil Management Plan (PSMP) has been prepared by FT (FT, 2026) for the Existing Development (refer to Appendix 4-2). The information below is a summary of the information presented in the PSMP.

Approximately 450,900m^3 cubic metres of peat and spoil was excavated during the construction of the Existing Development. This total includes material excavated from site roads, turbine foundation, hardstands, the substation site, and peat recovered as part of the emergency works undertaken in response to the November 2020 Peat Slide. The volumes of excavated peat and spoil are detailed in Table 8-6.

Peat and spoil excavated at the Wind Farm Site was accommodated in the borrow pits, peat cells (at the substation, T15 and T17) or sidecast alongside the access roads and hardstand areas. The volumes of material accommodated at each of the peat and spoil management areas are detailed in Table 8-7.

There was no loss of peat and spoil from the Wind Farm Site apart from peat transported and deposited along the banks of the Shruhangarve Stream outside of the Wind Farm Site following the November 2020 Peat Slide. It is estimated that the total volume of peat displaced by the 12th November 2020 Peat Slide was 86,240m^3, of which 45,500m^3 still remains within the slip scar.

Table 8-6: Peat and Spoil Volumes (PSMP – FT – 2026)

Infrastructure Element	Peat and Spoil Volume (m^3)
19 no. turbines and hardstands	117,850
Access Roads	207,000
Substation	38,950
Temporary compounds, concrete washouts, an ancillary infrastructure	8,100
Borrow Pits (3 no.)	58,200
Peat Cells (3 no.)	14,800
Peat recovered from Wall 1 following peat slide	6,000

Infrastructure Element	Peat and Spoil Volume (m^3)
Total	**450,900**

Table 8-7: Summary of Peat and Spoil Management Areas on Site (PSMP – FT – 2026)

Location	Storage Volume (m^3)
Borrow Pit (BP1)	49,500
Borrow Pit (BP2)	29,500
Borrow Pit (BP3)	15,000
Peat Cell (Substation)	15,500
Peat Cell (T15)	26,000
Peat Cell (T17)	4,300
Sidecasting	311,100
Total	**450,900**

8.4.2 Stone Volume Requirements

The construction of the Existing Development resulted in the removal and excavation of bedrock at some infrastructure locations and from borrow pits. To date, it is estimated that the amount of bedrock excavated at the Wind Farm Site is 457,027m^3. The rock was used in the construction of the Existing Development. Table 8-8 below presents the stone volume requirements for the Existing Development, excluding the final binding layer which was sourced externally.

Table 8-8: Summary of Stone Volume Requirements (PSMP – FT – 2026)

Infrastructure Element	Stone Volume (m^3)
19 no. turbines and hardstands	101,500
Access Roads (including cabling)	224,460
Substation Platform	3,732
Temporary compounds, concrete washouts, and ancillary infrastructure	275
Borrow Pit/Peat Cell berms	71,635
Peat slide stabilising berms	55,425
Total	**457,027**

8.5 Assessment of Significant Effects and Mitigation Measures

8.5.1 Do-Nothing Scenario

The 'Do-Nothing' alternative is an alternative scenario to retaining and regularising the Existing Development. In this scenario, the Existing Development will remain in-situ as an unauthorised and partially completed wind farm, which is, in effect, the "Do-Nothing" alternative insofar as it represents the current situation as at the date of the application for substitute consent.

There would be no direct negative environmental effects as a result of implementing the "Do-Nothing" alternative. However, by implementing this 'Do-Nothing' alternative, the opportunity to capture a significant part of the country's renewable energy resource by completing the Meenbog Wind Farm (subject to appropriate planning consents) would be lost, as would the opportunity to contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions. The opportunity to generate local employment, local authority development contributions, rates and investment in the local area would also be lost. Furthermore, the opportunity to implement the proposed biodiversity enhancement measures would be lost. Please see Appendix 6-4 Biodiversity Management and Enhancement Plan for details. Under the "Do-Nothing" alternative the opportunity to put in place the community benefit scheme proposed as part of the Prospective Development would also be lost.

The Do Nothing Scenario would not result in any new effects on the land, soils and geological environment. The effects of the works completed to date are assessed for the Existing Development in Section 8.5.2 below. The Do Nothing Scenario would not result in any additional change in the land environment, and no additional excavation/disturbance of peat, subsoils or bedrock would occur. The effects that have occurred to date as a result of the Existing Development would remain unchanged.

8.5.2 Existing Development – Assessment of Effects and Mitigation Measures

8.5.2.1 Effects on Land (Land-Take)

The baseline environment at the Existing Development locations largely comprised coniferous forestry, with existing forestry access tracks, peatland and pre-existing forestry borrow pits also present at some locations within the Wind Farm Site. The Existing Development resulted in an alteration of the baseline environment, within the footprint of the development. The land change comprised of felling of coniferous forestry and the replacement of natural ground with access roads and hardstand areas, borrow pits, peat storage areas and drainage infrastructure. The total infrastructure footprint of the Existing Development within the Wind Farm Site is approximately 32.6 ha, representing 3.7% of the total Wind Farm Site area (892ha). The footprint of the components of the Existing Development are summarised in Table 8-9.

No significant effects on land or landuse occurred along the Grid Connection underground cable route as works predominantly occurred within the carriageway of the existing public road network, in the road verge or Wind Farm Site access tracks. The works resulted in the excavation of a narrow trench to accommodate the cabling. This trench was reinstated with a comparable ground surface once the cabling was emplaced. The off-road section of the route was also reinstated, and works were completed over a very short time period in these lands. Meanwhile, a permanent change to land/landcover resulted from the construction of the onsite 110kV substation (0.95ha).

There was no potential for effects on the land or landuse adjoining the Wind Farm Site and Grid Connection Site.

Pathways: Excavation and infrastructure construction.

Receptors: Land and land-use.

Assessment of Effects:

Site walkover surveys have revealed that BPs have been partially restored, with peat from elsewhere on the Wind Farm Site as per the methodology detailed in the CEMP, with the deposited peat noted to be revegetating. The peat cells, berms and settlement ponds are also noted to be revegetating.

The effects can be summarised as follows:

- There have been no effects on the land environment (land use) outside of the footprint of the Existing Development (Note that the effects associated with the November 2020 Peat Slide are assessed separately in Section 8.5.2.8).
- The Existing Development was designed to utilise the pre-existing network of forestry access tracks as much as possible. Approximately 4.1km of the pre-existing solid road network and approximately 8.9km of the pre-existing floating forestry access tracks were upgraded to solid roads, with an additional 0.72km of pre-existing floating forestry tracks upgraded to floating access roads. The use of the pre-existing road network limited the requirement for new road construction and the associated land loss and earthworks.
- The loss of ~29.13ha of peat bogs and coniferous forestry has not had a significant effect on the land environment within the overall Wind Farm Site. The footprint of the Existing Development represents only ~3.7% of total Wind Farm Site area (~892ha). Therefore, the Existing Development has resulted in only a very small percentage change in landcover across the Wind Farm Site.
- The loss of peat bogs and coniferous forestry resulting from the Existing Development on a local or regional scale is minimal, and therefore the effects of actual land loss is imperceptible.
- The excavation of BP1, BP2 and BP3 resulted in a significant change in land use at these locations.
- No mitigation with respect to land loss was required as this is an accepted consequence of the construction of a wind farm development.
- The total amount of forestry felled as part of the Existing Development (73.6ha) is minor in terms of the amount of forestry present both at the Wind Farm Site and in the surrounding lands.
- Furthermore, in line with the Forest Service's published policies for wind farm development, the felled land was replanted at alternative sites. Replanting lands are identified in Appendix 4-3 of the rEIAR.

Residual Effects: Due to the small footprint of the Existing Development on a local and regional scale, the residual effects were negative, direct, slight to moderate, permanent, likely effect on land (land-take).

Significance of Effects: For the reasons outlined above (small development footprint), no significant effects on land (land-use) have occurred.

8.5.2.2 Peat, Subsoil and Bedrock Excavation

Excavation of mineral soil/subsoil and bedrock was required for the installation of foundations for the access roads, turbine hardstands and foundations, cable trenching and the on-site 110kV substation within the Wind Farm Site, and for the Grid Connection. Approximately 450,900m^3 cubic metres of peat and spoil was excavated during the construction of the Existing Development.

There was no loss of spoil from the Wind Farm Site. Peat and spoil excavated at the Wind Farm Site was accommodated in the borrow pits, peat cells (at the substation, T15 and T17) or sidecast alongside

the access roads and hardstand areas. The volumes of peat and their storage locations are detailed in Table 8-7 above.

Excavation of subsoils was also required along the Grid Connection underground cabling route. However, these deposits were either stockpiled locally and reinstated back into the trench or removed using trucks.

Pathway: Extraction/excavation.

Receptor: Peat, subsoil and bedrock.

Mitigation Measures:

The Existing Development was constructed as per the methodology and guidelines prescribed in the EIAR for the Permitted Development, detailed in the CEMP (MKO, 2019 – refer to Appendix 4-3 of this rEIAR). Note that the construction methodologies were updated during the construction of the Existing Development as advised by the project team to allow for changes to the drainage regime and the additional measures that were put in place following the November 2020 Peat Slide.

The mitigation measures implemented onsite during the construction works at the Wind Farm Site were as follows:

- All infrastructure was placed in areas with shallower peat where possible;
- The existing forestry road network was used to reduce peat excavation and borrow pit volumes where possible;
- Floating roads (where geotechnically acceptable to do so) were used to reduce peat excavation volumes;
- The peat and subsoil removed during the construction phase was relocated within the Wind Farm Site and localised to the infrastructure location (i.e. side cast) where practicable;
- The excavated peat was either used for landscaping, side-casting or was placed in the borrow pits and engineered peat cells;
- Side-cast rock aggregate was used to form the base of new roads;
- Sensitive habitats and designated sites were avoided;
- A minimal volume of peat, subsoil and rock was excavated and removed to allow for infrastructure works to take place in comparison to the total volume of these materials present on the Wind Farm Site due to optimisation of the wind farm design;
- Construction of settlement ponds to be volume neutral, and all excess material used locally to form pond bunds and surrounding landscaping; and,
- The peat placed in peat cells and in the borrow pits was allowed to revegetate.

The mitigation measures implemented during works along the Grid Connection underground cabling route included:

- Soils and subsoils excavated along the Grid Connection underground cabling route were temporarily stored in covered stockpiles along the edge of the road carriageway;
- Once the emplacement of the cable had been completed, the trench was backfilled with suitable imported material, with the exception of the off-road section which was reinstated using the excavated soils and subsoils;
- Excess material was removed from the Grid Connection Site with trucks;
- The tarmacadam surface along the road sections of the route was replaced with the same design standard as the surrounding road carriageway.

Assessment of Effects: Earthworks of this type, scale and magnitude have been granted permission and successfully completed at similar sites around the country. Indeed, the construction of the Existing Development and the associated removal of peat, subsoil and bedrock has been permitted at the Wind

Farm Site and Grid Connection Site. The EIAR for the Permitted Development estimated the volumes of peat/spoil and bedrock to be excavated to be ~450,900m^3 and 457,027m^3 respectively.

Furthermore, there was no loss (removal) of peat, spoil or bedrock within the Wind Farm Site as a result of the Existing Development. These materials were just relocated within the Wind Farm Site and/or used for construction of the Existing Development.

Residual Effect: The granular subsoils and peat at the Wind Farm Site and Grid Connection Site can be classified as of "Low" importance and the bedrock of "Medium" importance. The negative effect was the disturbance and relocation of 450,900m^3 of peat and spoil and 457,027m^3 of bedrock during construction. All works were completed in accordance with the 2017 Peat and Spoil Management Plan (as amended) (Appendix 4-2). Based on the design and mitigation measures incorporated into the construction of the Existing Development as described above, combined with the small footprint of the Existing Development on a site-scale, the residual effect was a negative, slight to moderate, direct, permanent effect on peat, subsoils and bedrock due to disturbance and relocation within the Wind Farm Site and Grid Connection Site.

Significance of Effects: For the reasons outlined above, and with the implementation of the mitigation measures, we consider that there has not been significant effects on peat, subsoils and bedrock.

8.5.2.3 Contamination of Soil and Bedrock by Leakages and Spillages

Accidental spillage during refuelling of construction plant with petroleum hydrocarbons is a pollution risk. The accumulation of small spills of fuels and lubricants during routine plant use can also be a significant pollution risk. Hydrocarbon has a high toxicity to humans, and all flora and fauna, including fish, and is persistent in the environment. Large spills or leaks have the potential to result in significant effects (i.e. contamination of peat, subsoils and pollution of the underlying aquifer) on the geological and water environment.

Pathway: Peat and subsoil and underlying bedrock pore space.

Receptors: Peat and subsoil, bedrock.

Mitigation Measures:

The mitigation measures implemented during the construction works were as follows:

- All plant was inspected and certified to ensured that they were leak free and in good working order prior to use.
- Wherever possible, vehicles were refuelled off-site, particularly for regular road-going vehicles.
- On-site refuelling of machinery was carried out at designated refuelling areas at various locations throughout the Wind Farm Site.
- Heavy plant and machinery were refuelled on-site by a fuel truck that came to the Wind Farm Site as required on a scheduled and organised basis.
- Other refuelling was carried out using mobile double skinned fuel bowser.
- All refuelling was carried out outside designated watercourse buffer zones.
- Only designated trained and competent operatives were authorised to refuel plant on-site.
- Mobile measures such as drip trays and fuel absorbent mats were used during refuelling operations as required.
- All plant and machinery were equipped with fuel absorbent material and pads to deal with any event of accidental spillage.
- An emergency plan for the construction phase to deal with accidental spillages was included within the Construction and Environmental Management Plan (Appendix 4-3). Spill kits were available to deal with and accidental spillage in and

outside the re-fuelling area. However no spills were recorded during the construction of the Existing Development.

Assessment of Effects: No significant pollution events, spillages of hydrocarbons or contamination of any kind were recorded during the construction of the Existing Development. It was not necessary to employ any of the emergency responses measures in relation to hydrocarbons.

Residual Effect: Any residual effects were, at worst, negative, imperceptible, indirect, short-term effects on peat, subsoils and bedrock.

Significance of Effects: For the reasons outlined above, and with the implementation of the listed mitigation measures it is concluded that there has not been significant effects on peat, subsoils and bedrock.

8.5.2.4 Erosion of Exposed Subsoils and Peat During Construction

Peat was removed from the Existing Development locations and was used for landscaping, site-cast at appropriate locations or placed within the borrow pits and/or peat cells. In the absence of mitigation measures, there would have been a high likelihood of erosion of peat and spoil during excavation and construction works due to vehicle movement, surface water and wind action.

The effects of the Existing Development in terms of peat stability are assessed separately in Section 8.5.2.8. The main effects associated with this aspect relate to the water environment, and therefore this aspect is further assessed in detail in Chapter 9 Hydrology and Hydrogeology.

Pathway: Vehicle movement, surface water and wind action.

Receptor: Peat and subsoil.

Mitigation Measures:

The EIAR for the Permitted Development prescribed detailed mitigation measures relating to the storage and management of peat and subsoils on-site which were implemented onsite along with the measures outlined in the 2019 CEMP. Note that the construction methodologies were updated during the construction of the Existing Development as advised by the project design team. Standard mitigation measures for the prevention of the subsoil erosion were implemented during the construction works. The implemented mitigation measures were as follows:

- The project geotechnical engineer carried out inspections and monitoring of all development on site and did not note any concerns;
- Erosion control measures were implemented before any site clearance works commenced;
- The area of exposed ground was minimised by maintaining pre-existing vegetation that would otherwise have been subject to erosion;
- All peat clearance works were delayed before construction began to ensure that stripping did not occur months in advance of construction activities;
- Silt fences were installed around stockpiles to limit the movement of entrained sediment in surface water runoff;
- All stockpiles were located away from drains and watercourses and all drains and watercourses were protected by silt trapping apparatus such as silt fences;
- No work was permitted near watercourses during or after prolonged rainfall or an intense rainfall event;
- Appropriate silt control measures were installed such as silt-traps, check dams and settlement ponds;
- During felling and forestry works, brash mats were used to support vehicles on soft ground, reducing peat and mineral soils erosion and avoiding the formation of rutted

areas, in which surface water ponding can occur. Brash mats were renewed when they became heavily used and worn. Brash mats were used along all off-road routes to protect soil from compacting and rutting;
- All controls were regularly inspected and maintained and vegetation had re-established; and,
- All works were completed in accordance with the above mitigation measures which were detailed in the CEMP.

Assessment of Effects: No adverse effects. The revegetation of the borrow pits, peat cells and settlement ponds has proven to be successful in retaining peat and preventing erosion. No significant erosion events were recorded at the Wind Farm Site prior to the November 2020 Peat Slide, which is assessed separately in Section 8.5.2.7.

Residual Effect: The residual effect was, at worst, a negative, slight, direct, short-term effect on peat and subsoils by erosion and wind action.

Significance of Effects: For the reasons outlined above, no significant effects on soils, subsoils or bedrock occurred.

8.5.2.5 Erosion of Exposed Soils/Subsoils During Tree Felling

Tree felling was a significant component of the Existing Development with a total of 73.6ha of forestry being felled.

During felling operations there is a high likelihood of erosion due to the distance of soils and subsoils associated with vehicle and plant movements. This also has associated potential effects on the water environment; and therefore, this aspect is assessed in further detail in Chapter 9 Hydrology & Hydrogeology.

Pathway: Vehicle movement, surface water and wind action.

Receptor: Soils, subsoil and weathered bedrock.

Proposed Mitigation Measures:

All proposed felling works were completed in accordance with the best practice Forest Service regulation, policies and strategic guidance documents as well as Coillte and DAFM guidance documents to ensure that felling results in minimal potential negative effects on the local soil and subsoil environment. In addition, the mitigation measures implemented during felling operations were as follows:

- Before any works were completed silt fences were installed to limit the movement of entrained sediment in surface water runoff;
- The plant used (i.e. the harvester and the forwarder) were designed specifically for the forest environment and are low ground pressure machines;
- All machinery was operated by suitably qualified personnel;
- These machines traversed the Wind Farm Site along specified off-road routes (referred to as racks);
- Brash mats were placed on the racks to support the vehicles on soft ground, reducing mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding could have occurred;
- As felling progressed, the harvester collected brash produced by the felling and placed it in front of the machine before it advanced forward along the rack;
- The condition of the racks were continually monitored and fresh brash was applied when the brash mat became heavily used and worn, ensuring that the mat remained effective throughout the operational phase; and,

- The location of racks were chosen to avoid wet and potentially sensitive areas.

Assessment of Effects: No significant erosion events were recorded at the Wind Farm Site during tree felling operations.

Residual Effects: The residual effect is considered to be, at worst, a negative, imperceptible, direct, permanent, likely effect on soils, subsoils and weathered bedrock.

Significance of Effects: For the reasons outlined above, and with the implementation of the mitigation measures, no significant effects on soils, subsoils or bedrock occurred.

8.5.2.6 Excavation and Reinstatement of Borrow Pits

The removal of the overlying peat and spoil and the extraction of bedrock was completed at the 3 no. borrow pits locations to facilitate the construction of the Existing Development. Peat was also managed at these locations to manage excess peat generated during the construction activities and to reinstate these borrow pits.

Pathway: Extraction/excavation.

Receptor: Peat, subsoil and bedrock.

Mitigation Measures:

The borrow pits were excavated as per the methodology and guidelines prescribed in the CEMP.

The mitigation measures implemented during the excavation and reinstatement of these borrow pits were as follows:

- Prior to excavation, the areas of the BPs were marked out at the corners using ranging rods and timber posts. Drainage and associated settlement ponds were installed around the perimeter;
- The initial excavation involved the removal of peat and overburden deposits. These materials were used to form a berm on the downhill side of the BP;
- Interceptor drainage ditches were excavated on the upslope sides of the BP;
- The bedrock material was extracted from the BP and stockpiled or used as required;
- Excavation works were undertaken and supervised by an experienced contractor and suitably qualified personnel;
- The borrow pits were developed with stable ground inclinations;
- The stability of the rock faces were inspected by the Project Geotechnical Engineer upon excavation to ensure stability;
- As the BP excavations progressed deeper, any ingress of water was removed via pumping to the installed settlement ponds;
- When extraction ceased, the uphill face of the rock was stepped and deposits of soil placed which assisted the revegetation of the rock face;
- Upon the removal of the required volumes of material (for the construction of the infrastructure elements at the Wind Farm Site) from the BPs, the pits were reinstated using excavated peat and spoil;
- The borrow pits were designed and constructed in a way which allowed the excavated peat and spoil to be placed safely, with areas within the borrow pits designated for the storage of backfill with excavated peat;
- Rock buttresses were constructed within the borrow pits to help retain placed peat and spoil. The founding stratum for each buttress was inspected and approved by the Project Geotechnical Engineer; and,
- Infilling of peat and spoil commenced at the back of the borrow pit and progressed towards the pit entrance.

Residual Effects: The residual effect is considered to be, at worst, a negative, slight, direct, permanent effect on peat, subsoils and bedrock due to their disturbance and relocation within the Wind Farm Site.

Significance of Effects: For the reasons detailed above, and with the implementation of the listed mitigation measures, no significant effects on peat, subsoils or bedrock have occurred.

8.5.2.7 Effect on Geological Heritage Sites

As detailed in Section 8.3.6, the Barnesmore Gap County Geological Site (CGS) (Site Code: DL002) overlaps with the northwest of the Wind Farm Site and sections of the Grid Connection underground cable route. Furthermore, the Grid Connection underground cable route overlaps with the Donegal and Inver Bays CGS.

The potential of the Existing Development to effect these designated sites was limited due to the nature of the infrastructure within these areas which was limited to the upgrade of existing site access roads and the excavation and reinstatement of the Grid Connection underground cable trench.

Pathway: Excavation/removal of overburden.

Receptor: Geological Heritage Sites -Barnesmore Gap CGS and Donegal Inver Bays CGS.

Mitigation Measures:

The mitigation measures detailed in the preceding sections (and in the 2019 CEMP) were implemented with respect to the excavation of soils/subsoils and the storage of materials.

Assessment of Effects:

Barnesmore Gap CGS: The Wind Farm Site is located at the northern periphery of this large CGS which has a total area of 577ha. The works associated with the Existing Development within the Wind Farm Site which overlap with this CGS included ~1.2km of Wind Farm access roads. These roads were upgraded as part of the Existing Development, with forestry access tracks existing in these areas as part of the baseline environment. Therefore, there was no potential for significant effects given the scale of the works and the scale of the CGS.

Similarly, the works associated with the Grid Connection comprised solely of the excavation and reinstatement of the underground cable trench within the Wind Farm Site (~1.2km in length) and ~3km adjacent to the N15 National Road. These works were completed over a short-time period and the trench was reinstated to a comparable ground surface. Therefore, there was no potential for significant effects on the CGS.

Donegal and Inver Bays CGS: The Grid Connection is located at the eastern periphery of this large CGS which has a total area of 280km^2. The works associated with the Grid Connection within the CGS comprised solely of the excavation and reinstatement of the underground cable trench (~1.2km) along public roads. These works were completed over a short-time period and the trench was reinstated to a comparable ground surface. Therefore, there was no potential for significant effects on this CGS.

Residual Effects Given the scale and nature of the works which overlap with the mapped extents of the CGSs the residual effect was a negative, imperceptible, direct, long-term effect on the Barnesmore Gap CGS and the Donegal and Inver Bays CGS.

Significance of Effects For the reasons outlined above, no significant effects on the Barnesmore Gap CGS or the Donegal and Inver Bays CGS have occurred.

8.5.2.8 Peat Instability and Failure

A Peat Stability Assessment (PSA) was carried by FT (2026) for the Existing Development (Appendix 8-1). The assessment considers the guidelines for geotechnical/peat stability risk assessments as given in PLHRA (2007).

Peat instability or failure refers to a significant mass movement of a body of peat that would have an adverse impact on the Existing Development and the surrounding environment. The potential significant effects of peat failure at the Wind Farm Site may have resulted in:

- Death or injury to site personnel;
- Damage to machinery;
- Damage or loss of infrastructure;
- Drainage disruption by blockage of drainage pathway by relocated peat and spoil;
- Site works damaged or unstable;
- Contamination of watercourses, water supplies by particulates; and,
- Degradation of the peat environment by relocation of peat and spoil.

The PSA recorded several minor peat movements and instabilities which occurred at the Wind Farm Site on or before June 2020. These are described in Section 8.3.8.2.4 and the effects were localised due to the small nature of these mass movements.

A significant peat slide occurred on the 12th November 2020 during the construction of a floating road to T7 (refer to Section 8.3.8.2.5). The November 2020 Peat Slide had a significant effect on land, peat and subsoils with ~86,240m^3 of peat being displaced by the slide. The land environment (in terms of land and topography) was also altered within the slip scars and downslope of the peat slide.

Pathway: Peat slide/Landslide.

Receptor: People, land, peat, water and infrastructure.

Assessment of Residual Effects: The construction of the Existing Development has had an effect on peat stability at the Wind Farm Site. A significant peat slide occurred on 12th November 2020 during the construction of a floating access road to T07. The 2026 PSA completed for the Existing Development (Appendix 8-1) listed the construction of the floating road as a contributory factor to the peat slide. A large body of very weak and saturated peat upgradient of the access road relied for lateral stability on the peat slope upon which the floating road was being constructed. However, the report also states that this factor alone would not have caused the peat slide, with topography, preceding rainfall patterns, drainage patterns, peat strengths and downgradient felling operations also contributing factors to the occurrence and scale of the November 2020 Peat Slide.

The effect was the movement of 86,240m^3 of peat, of which 45,500m^3 remains within the slip scar. The effect on land was the loss of 3.58ha of peatland/forestry (2.4ha peatland in the upper scar and 1.18ha forestry in the lower scar) and the disturbance of land downgradient of the slip scars.

The PSA (FT, 2026) found that that the Existing Development is stable. Given the history of the Wind Farm Site, the PSA proposes monitoring of certain locations to demonstrate that the Wind Farm Site continues to be stable in the future. There is not currently considered to be an ongoing risk of peat failure on the Wind Farm Site from the Existing Development.

Mitigation Measures:

The standard mitigation measures implemented at all Existing Development locations during the construction works with respect to peat stability were as follows:

- The Emergency Response Plan (Section 6 of the 2019 CEMP) which provides detailed procedures in the case of an emergency onsite was actioned;
- The project geotechnical engineer carried out inspections and monitoring of all development on site and did not note any concerns;
- Experienced and competent contractors were appointed;
- The Wind Farm Site and Grid Connection Site was supervised by experienced and qualified personnel;
- Sufficient time was allocated for the project;
- Prevented undercutting of slopes and unsupported excavations;
- Maintained and managed robust drainage system;
- Prevented placement of loads/overburden on marginal ground;
- Set up, maintained and reported findings from monitoring systems (as outlined in the PSA);
- Ensured construction method statements were developed and agreed before works commenced and all method statements were followed by the contractor; and,
- Revised and amended the Construction Risk Register as construction progresses to ensure that risks are managed and controlled for the duration of construction.

Following the November 2020 Peat Slide, a comprehensive review of the construction methodologies being employed on-site was undertaken by Fehily Timoney. Following this review a document entitled 'Construction Responses to Fehily Timoney Mitigation Measures', was prepared by the contractor (MCE Ltd.) in August 2021 (MCE, 2021) to accompany the Fehily Timoney report 'Peat Stability Assessment of Meenbog Wind Farm Site' (FT, 2021). The MCE (2021) document outlined additional mitigation measures and revised construction methodologies to be utilised during the construction of the outstanding elements required to complete the Meenbog Wind Farm. These measures and methodologies were implemented for all construction activities undertaken on-site since the publication of the MCE (2021) document.

Residual Effect: The findings of the PSA completed by FT in 2026 demonstrated that the Existing Development is stable and that there is a low risk of peat failure occurring in the future. This PSA was preceded by earlier assessments completed by AFRY as reported in 2021 and AFRY in 2023 both of which also found that all as built infrastructure are stable.

Given the findings of the PSA, the assessments the post-construction site inspections, along with the implementation of the control measures prescribed in the 2019 CEMP, the residual effect was a negative, moderate, direct, permanent effect on peat and land associated with the November 2020 Peat Slide. The effect is considered to be moderate as the volumes of peat which were disturbed as a result of the peat slide (86,240m^3) equate to 19% of the total volume of peat disturbed as a result of the Existing Development. In the context of the volumes of peat present at the Wind Farm Site and in the wider area, the volumes moved by the peat slide are considered to be minor. Furthermore, the effect on land is considered to be moderate (not significant) as the area of the slip scars (3.58ha) equates to only 0.4% of the total Wind Farm Site area (892ha).

Refer to ~Chapter 9 Hydrology and Hydrogeology for an assessment of residual effects on the water environment.

No residual effects on people or infrastructure occurred as a result of the peat slide. No infrastructure (apart from that associated with the Existing Development) was located downgradient of the peat slide along the Shruhangarve Stream.

Significance of Effects: For the reasons outlined above, and with the application of the mitigation measures outlined above, in accordance with the criteria set out in Table 8-3, no significant effects on peat, people, land and infrastructure have occurred.

8.5.2.9 Effects from Wastewater Disposal

Release of effluent from on-site temporary wastewater treatment systems has the potential to contaminate soils, subsoils and bedrock.

Pathway: Peat and subsoil and underlying bedrock pore space.

Receptors: Peat and subsoil, bedrock.

Mitigation Measures: The EIAR for the Permitted Development prescribed detailed mitigation measures relating to wastewater disposal for the protection of surface and groundwater quality.

The mitigation measures implemented to avoid release of wastewater at the Wind Farm Site and Grid Connection Site were as follows:

- A self-contained port-a-loo with an integrated waste holding tank was used for welfare facilities, maintained by the providing contractor;
- Welfare facilities were also present at the onsite substation (constructed as part of the Existing Development). Wastewater was stored in an underground tank and was removed by a licenced contractor; and,
- Wastewater treatment on-site has not been implemented.

Assessment of Effects: No pollution incidents in relation to wastewater were recorded.

Residual Effects: The potential for contamination resulting from wastewater disposal is a risk at all construction sites containing welfare facilities. Proven and effective measures to mitigate the release of wastewater on site were implemented and broke the pathway between the source and each receptor.

Any residual effects were therefore, at worst, a negative, indirect, imperceptible and short-term effect.

Significance of Effects: For the reasons outlined above, no significant effects on occurred.

8.5.3 Risk of Major Accidents and Disasters

The main risk of Major Accidents and Disasters at peatlands sites is related to peat instability.

A significant peat movement occurred at the Wind Farm Site on 12th November 2020 which resulted in significant permanent negative effects on the land, soils and geological environment as detailed in the retrospective impact assessment detailed above. The effect was the movement of ~86,240m^3 of peat and loss of 3.58ha of peatland/forestry within the slip scars (2.4ha peatland in the upper scar and 1.18ha forestry in the lower scar) and the disturbance of land downgradient of the slip scars. The effects on peat and land are assessed in Section 8.5.2.8 above. The November 2020 Peat Slide resulted in liquefied peat entering the Shruhangarve Stream and the effects on water quality are assessed in Chapter 9 of this rEIAR.

Comprehensive peat stability assessments were completed by FT and AFRY following the November 2020 Peat Slide. The Ionic assessment (Ionic, 2021), which was based on a quantum of site-specific data, concluded that the "the overall site is currently stable based upon this detailed assessment carried out along all roads, hardstandings, borrow pits, peat storage areas and peat stabilisation areas. Furthermore, AFRY completed a site inspection in October 2023 and concluded that all infrastructure, including the Existing Development, are stable (AFRY 2023). The FT report (FT, 2021) prescribes a monitoring plan in relation to potential future ground movements. The recent PSA (FT, 2026) concluded that the Existing Development is stable and that there is a low risk of instability in the future.

8.5.4 Human Health Effects

Potential health effects arise mainly through soil and ground contamination. The Wind Farm Site and Grid Connection Site is not a recognized source of pollution (e.g. it's not a waste management site, or a chemical plant), and there has been no record of hydrocarbons spillages or leaks associated with the Existing Development. Hydrocarbons were used onsite during construction; however, the volumes were small in the context of the scale of the Existing Development. All hydrocarbons were handled and stored in accordance with best practice mitigation measures. No health effects have occurred or will occur as a result of soil or ground contamination. Therefore, the subsequent health effects are imperceptible.

Largescale peat slides can lead to injury and loss of life. As discussed in section 8.5.2.8 above, and Chapter 5 population and Human Health, there were no residual effects from the peat slide on human health. No injury or health and safety related accident occurred due to the peat slide. The Wind Farm Site is located in a remote, sparsely populated part of Donegal with the majority of the slide remaining contained within the Wind Farm Site save for some peat flow downstream of the Shruhangarve River. As such there was no potential for impact to population or human health from the peat slide and therefore no residual effects occurred.

8.5.5 Cumulative Effects- Existing Development

This section presents an assessment of the cumulative effects associated with the construction of the Existing Development and other developments, existing and/or proposed at the time of construction, on land, soils and geology. Due to the localised nature of the construction works, which were kept within the Wind Farm Site and Grid Connection Site boundary, there was no potential for significant cumulative effects in-combination with other local developments (outside of the Wind Farm Site and Grid Connection Site boundary) on the land, soils and geology environment. The only exception to this was the deposition of peat along the banks of the Shruhangarve Stream further downstream, following the November 2020 Peat Slide, with the deposition extending beyond the boundaries of the Wind Farm Site. The peat deposition was local to the stream channel and the rehabilitation works have ensured that the effect was a short-term, direct, negative effect on land (refer to assessment below).

The Existing Development could have had in combination effects with other off-site projects and plans is via the drainage and off site surface water network, and this hydrological pathway is assessed in Chapter 9 Hydrology & Hydrogeology.

Cumulative Effects with Remediation Works for the November 2020 Peat Slide

Restoration works were carried out to the Shruhangarve Stream and the peat slide slip scar in response to a notice issued by Donegal County Council (DCC) dated 17th November issued under Sections 12 (1) of the Local Government (Water Pollution) Acts, relating to the discharge of peat, sediment, and heavily soiled water from the Wind Farm Site to the Shruhangarve Stream and Mourne Beg River.

The works completed to rehabilitate these areas in the aftermath of the peat slide included the following:

- The removal of fallen trees and debris to aid revegetation;
- The entire slip scar was seeded manually;
- Live stakes were installed on both sides of an existing drainage channel to provide stability through the establishment of fast growing native willows; and,
- Other areas in the slip scar were planted manually with bare root saplings.

These works had a positive effect on the land environment, by providing increased stability of the peat by revegetating. However, the slip scars will never be restored to their baseline conditions which existed prior to the peat slide. The residual effect of the rehabilitation works has been a positive,

imperceptible, long-term, direct effect on land within the upper and lower scars. A detailed description of the remedial measures undertaken in response to the November 2020 Peat Slide is provided in Appendix 2-3 of this rEIAR.

Since the effect of the remediation works has been positive there was no potential for negative cumulative effects with the Existing Development.

Cumulative Effects with Other Plans and Projects

Due to the localised nature of the construction works, which were kept within the Wind Farm Site and Grid Connection Site boundary, there was no potential for significant cumulative effects in-combination with other local developments, plans or projects on the land, soils and geology environment.

8.5.6 Assessment of Potential In-Cumulation Effects

This section addresses the potential cumulative effects of the Existing Development combined with the Prospective Development and assesses the effects of the Subject Development (i.e. the Existing and Prospective Development combined) on the land, soils and geological environment. An assessment of the In-Cumulation effects of the Subject Development are presented in Table 8-10 below.

As detailed in this chapter, with the implementation of the prescribed mitigation measures the Existing Development did not result in significant effects on the land, soils and geological environment. The EIAR concludes that, with the implementation of the prescribed mitigation measures the Prospective Development will not result in any significant effects on the land, soils and geological environment. Therefore, there is no potential for significant In-Cumulation effects from the Subject Development.

Table 8-10: Assessment of Potential In-Cumulation Effects of the Subject Development

Assessment Heading	Existing Development	Prospective Development	Subject Development
Land (Land-Take)	This rEIAR concluded that the residual effect was a negative, direct, slight to moderate, permanent, likely effect on land (land-take). There were no significant effects.	With the implementation of the prescribed mitigation measures, the residual effect on land (land-take) will be a negative, direct, slight, likely, permanent effect. There will be no significant effects.	The effects on land (land-take) from both the Prospective Development and the Existing Development are considered to be not significant. The In-Cumulation effects on land from the Subject Development are Imperceptible.
Excavation of Peat/Soils/Subsoils	This rEIAR concluded that the residual effect was a negative, slight to moderate, direct, permanent effect on peat/soils/subsoils. There were no significant effects.	With the implementation of the prescribed mitigation measures, the residual effect on peat/soils/subsoils will be a negative, slight to moderate, direct, likely, permanent effect. There will be no significant effects.	The effects on peat/soils/subsoils from both the Prospective Development and the Existing Development are considered to be not significant. The In-Cumulation effects on peat/soils/subsoils from the Subject Development are Imperceptible.
Contamination due to Hydrocarbons	This rEIAR concluded that the residual effect was, at worst, negative, imperceptible, indirect, short-term effect on peat, subsoils and bedrock. There were no significant effects.	With the implementation of the prescribed mitigation measures, the residual effect on peat/soils/subsoils and bedrock will be a negative, imperceptible, direct, short-term, low unlikely effect. There will be no significant effects.	The effects on peat/soils/subsoils and bedrock from both the Prospective Development and the Existing Development are considered to be not significant. The In-Cumulation effects of hydrocarbon contamination from the Subject Development are Imperceptible.
Contamination due to Wastewater	This rEIAR concluded that the residual effect was, at worst, negative, imperceptible, indirect, short-term effect on peat, subsoils and bedrock. There were no significant effects.	With the implementation of the prescribed mitigation measures, the residual effect on peat/soils/subsoils and bedrock will be a negative, imperceptible, direct, short-term, low unlikely effect. There will be no significant effects.	The effects on peat/soils/subsoils and bedrock from both the Prospective Development and the Existing Development are considered to be not significant. The In-Cumulation effects of wastewater contamination from the Subject Development are Imperceptible.
Erosion of Peat/Soils/Subsoils During Construction	This rEIAR concluded that the residual effect was, at worst, a negative, slight, direct, short-term effect on peat/soils/subsoils. There were no significant effects.	With the implementation of the prescribed mitigation measures, the residual effect on peat/soils/subsoils will be a negative, slight, direct, short-term, likely effect. There will be no significant effects.	The effects on peat/soils/subsoils from both the Prospective Development and the Existing Development are considered to be not significant. The In-Cumulation effects of erosion during construction from the Subject Development are Imperceptible.

Assessment Heading	Existing Development	Prospective Development	Subject Development
Erosion of Peat/Soils/Subsoils During Felling Works	This rEIAR concluded that the residual effect was, at worst, a negative, imperceptible, direct, permanent, likely effect on peat/soils/subsoils. There were no significant effects.	With the implementation of the prescribed mitigation measures, the residual effect on peat/soils/subsoils will be a residual effect will be a negative, imperceptible, direct, permanent, unlikely effect. There will be no significant effects.	The effects on peat/soils/subsoils from both the Prospective Development and the Existing Development are considered to be not significant. The In-Cumulation effects of erosion during felling from the Subject Development are Imperceptible.
Peat Instability	This rEIAR concluded that the residual effect was, was a negative, moderate, direct, permanent effect on peat and land associated with the November 2020 peat slide. There were no significant effects.	With the implementation of the prescribed mitigation measures, the residual effect on peat/soils/subsoils will be a negative, imperceptible, direct, permanent, unlikely effect. There will be no significant effects.	The effects on peat/soils/subsoils from both the Prospective Development and the Existing Development are considered to be not significant. The In-Cumulation effects of peat instability from the Subject Development are Imperceptible.
Effects on Geological Heritage Sites	This rEIAR concluded that the residual effect was, was a negative, imperceptible, direct, long-term effect on the Barnesmore Gap CGS and the Donegal and Inver Bays CGS. There were no significant effects.	With the implementation of the prescribed mitigation measures, the residual effect on geological heritage sites will be negative, imperceptible, direct, long-term effect. There will be no significant effects.	The effects on geological heritage sites from both the Prospective Development and the Existing Development are considered to be not significant. The In-Cumulation effects on geological heritage from the Subject Development are Imperceptible.
Excavation and Reinstatement of Borrow Pits	The rEIAR concluded that the residual effect was, was a at worst, a negative, slight, direct, permanent effect on peat, subsoils and bedrock. There were no significant effects.	With the implementation of the prescribed mitigation measures, the residual effect on peat/soils/subsoils and bedrock will be a negative, irreversible, slight, direct, likely, permanent effect. There will be no significant effects.	The effects on peat/soils/subsoils and bedrock from both the Prospective Development and the Existing Development are considered to be not significant. The In-Cumulation effects from excavation and reinstatement of borrow pits from the Subject Development are Imperceptible.

8.5.7 Cumulative Effects- Subject Development

The potential for cumulative impacts between the Subject Development and other wind energy developments, as well as other relevant non-wind projects and plans (existing, permitted, and proposed), has been assessed in order to determine the overall effect on land, soils and geology. Due to the localised nature of the construction works associated with the Subject Development, which were and will be kept within the Site boundary, there is no potential for cumulative effects with other projects and plans on the land, soils and geology environment.

8.5.8 Transboundary Effects

This section addresses the potential transboundary effects of the Subject Development on the land, soils and geological environment.

Due to the localised nature of the construction works which are retained within the Site, there is no potential for direct transboundary effects on Northern Ireland from excavation of peat, subsoil, bedrock, erosion of soils/subsoils or impacts to geological heritage.

The was and is potential for indirect transboundary effects on Northern Ireland via the drainage and off-site surface water network, and this hydrological pathway (refer to Chapter 9 Hydrology and hydrogeology for this assessment), and through the downstream impacts from the November 2020 Peat Slide. The November 2020 Peat Slide had a direct, significant effect on land, peat and subsoils within the Wind Farm Site through the movement of peat and subsoils through the Site, and an indirect effect on the banks of the Shruhangarve Stream located within Northern Ireland. An assessment of the potential transboundary effects are presented in Table 8-11 below.

Table 8-11: Assessment of Potential Transboundary Effects of the Existing Development

Assessment Heading	Existing Development	Transboundary Effects
Effects on Land (Land-Take)	Section 8.5.2.1 above concludes that the residual effects were negative, direct, slight to moderate, permanent, likely effect on land (land-take). The effects were localised to the footprint of the Existing Development within the Wind Farm Site and Grid Connection Site, and did not extend outside of the Wind Farm Site and Grid Connection Site boundaries.	There were no Transboundary Effects in terms of land (land-take) as a result of the Existing Development.
Effects from the Excavation of Peat/Soils/Subsoils and Bedrock	Section 8.5.2.2 above concludes that the residual effect was a negative, slight to moderate, direct, permanent effect due to disturbance and relocation within the Wind Farm Site and Grid Connection Site. The effects were localised within the Wind Farm Site and Grid Connection Site, and did not extend outside of the Wind Farm Site and Grid Connection Site boundaries.	There were no Transboundary Effects from the excavation of peat/soils/subsoils as a result of the Existing Development.
Effects from Contamination due to Hydrocarbons	Section 8.5.2.3 above concludes that the residual effects were, at worst, negative, imperceptible, indirect, short-term effects on peat, subsoils and bedrock. Any effects were localised within the Wind Farm Site and Grid Connection Site, and did not extend outside of the Wind Farm Site and Grid Connection Site boundaries.	There were no Transboundary Effects from the contamination of soils/subsoils and bedrock as a result of the Existing Development.
Effects from Contamination due to Wastewater	Section 8.5.2.9 above concludes that the residual effects at worst, a negative, indirect, imperceptible and short-term effects. Any effects were localised within the Wind Farm Site and Grid Connection Site, and did not extend outside of the Wind Farm Site and Grid Connection Site boundaries.	There were no Transboundary Effects from the contamination of soils/subsoils and bedrock as a result of the Existing Development.

Assessment Heading	Existing Development	Transboundary Effects
Effects from the Erosion of Peat/Soils/Subsoils During Construction	Section 8.5.2.4 above concludes that the residual effects at worst, a negative, indirect, imperceptible and short-term effects. Any effects were localised within the Wind Farm Site and Grid Connection Site, and did not extend outside of the Wind Farm Site and Grid Connection Site boundaries.	There were no Transboundary Effects from the erosion of peat/soils/subsoils during construction works as a result of the Existing Development.
Effects from the Erosion of Peat/Soils/Subsoils During Felling Works	Section 8.5.2.5 above concludes that the residual effects were at worst, a negative, imperceptible, direct, permanent, likely effect on soils, subsoils and weathered bedrock. Any effects were localised within the Wind Farm Site, and did not extend outside of the Wind Farm Site boundary.	There were no Transboundary Effects from the erosion of peat/soils/subsoils during felling works as a result of the Existing Development.
Effects from Peat Instability	Section 8.5.2.8 above concludes that the residual effects were negative, moderate, direct, permanent effect on peat and land associated with the November 2020 Peat Slide. Any effects were localised within the Wind Farm Site immediate area of the November 2020 Peat Slide and the slip scars.	There were no Transboundary Effects from peat instability as a result of the Existing Development.
Effects on Geological Heritage Sites	Section 8.5.2.7 above concludes that the residual effects were negative, imperceptible, direct, long-term effect. Any effects were localised within the Wind Farm Site and Grid Connection Site, and did not extend outside of the Wind Farm Site and Grid Connection Site boundaries.	There were no Transboundary Effects on geological heritage sites as a result of the Existing Development.
Effects from the Excavation and	Section 8.5.2.6 above concludes that the residual effect was at worst, a negative, slight, direct, permanent effect on peat, subsoils and bedrock.	There were no Transboundary Effects from the excavation and reinstatement of the borrow pits as a result of the Existing Development.

Assessment Heading	Existing Development	Transboundary Effects
Reinstatement of Borrow Pits	Any effects were localised within the Wind Farm Site, and did not extend outside of the Wind Farm Site boundary.	

8.5.9 Post Construction Monitoring

The monitoring of ground movement in relation to peat stability will be completed during the continued construction phase and the operation phase. The monitoring plan is detailed in Section 11.2 of the PSA (FT, 2026). The monitoring is proposed to provide advance warning of longer-term movements and shall be cited at critical locations. A total of 15 no. locations across the site have been identified for ground monitoring. This monitoring shall consist of a series of wooden posts inserted into the ground to create a straight line and any deviation of the posts would indicate potential movement of peat. The monitoring shall be read at monthly intervals or following heavy rainfall.