TOBIN

Lissinagroagh Wind Farm

Spoil and Peat Management Plan

Appendix 2-5

BUILT ON KNOWLEDGE

Document Control Sheet	
Document Reference	10955_R_SPMP_001
Client:	FuturEnergy Ireland
Project Reference	10955

Rev	Description	Author	Date	Reviewer	Date	Approval	Date
A	First Issue	MG	08/12/2023	JD	08/01/2023	OF	12/12/2024
B	Second Issue	PMCS	08/04/2026	JD	20/04/2026	OF	23/04/2026

Table of Contents

List of Tables

1. INTRODUCTION

The proposed project, known as Lissinagroagh Wind Farm is located in Leitrim approximately 2km northeast of Manorhamilton.

The proposed project comprises:

- A wind farm containing fourteen (14) wind turbines, an on-site 110 kV electrical substation and other ancillary infrastructure including access roads and drainage;
- A 110 kV underground grid connection to connect the wind farm to the National Grid at the existing ESBN Srananagh substation in Co. Sligo;
- Works required along the public road network between Killybegs, Co. Donegal and the proposed site to facilitate turbine and construction material delivery.

The proposed wind farm site is located in a relatively mountainous area. Operator in the northwest of the site is 360m AOD (above ordinance datum) and Dough Mountain is located within and along the eastern site boundary and has a maximum elevation of 462m AOD. The proposed wind farm site stretches through the valley between these two elevated areas and gently rises to the north. The southern portion of the site is where elevation is lowest at 100-140m AOD. As the site extends northwards through the valley between the two mountains, the elevation rises steadily to 285m AOD. The eastern section of the study area is mapped as elevated mountain dome, while the western section is mapped as mountain ridge, according to GSI physiographic mapping.

The Grid Connection Route (GCR) extends southward from the proposed substation location. The proposed GCR runs from the proposed substation in the west of the proposed wind farm southwest along the public road network for approximately 33.5 km to the existing ESBN 110/220kV Srananagh substation in Co. Sligo.

The land use/activities on the site itself is predominantly forestry plantation with agricultural lands to the northwest and east of the site. Forestry is comprised predominantly of coniferous with limited broadleaf areas. Approximately 800 ha are in Coillte's ownership whilst the remaining comprise third-party owned areas of agricultural grassland, and commercial forest. There is an extensive network of existing internal access roads and track across the proposed wind farm to facilitate the ongoing forestry operations as well as local access to farmlands. The wind farm site is characterised by locally steep topography.

Peat is defined as the partially decomposed remains of plants and soil organisms which have accumulated at the surface of the soil profile. Active peatlands are traditionally described using a simple 2-layer model; the acrotelm including active peat vegetation and catotelm. No active peat was recorded in the footprint of the proposed project.

Peat and peaty soils were encountered mainly to the north and northwest of the site at T1 to T7. No peat (>0.5m) was encountered at the proposed substation. The peaty soil and peat on site is predominantly drained or modified due to historical turf cutting, farming activity and afforestation. It is proposed to manage peat within the site boundaries. There are no indications of peat instability on the wind farm site.

1.1 OBJECTIVE

The role of the Spoil and Peat Management Plan (SPMP) is to demonstrate that the management of peat excavated during construction of the proposed project has been considered and will be treated appropriately during the construction process.

This SPMP also includes a monitoring programme which will be implemented during the construction phase of the proposed project and a contingency plan should peat instability/failure occur at the site. The SPMP acts as a live document arising from information presented during the consenting process, possible planning conditions and the content of which will be updated as work is carried out on site.

The SPMP contains some drainage guidelines for construction works and for management of peat on site. It should be noted that the control of water quality and drainage measures for site is outlined in detail in Chapter 8 (Hydrology and Hydrogeology) of the Environmental Impact Assessment Report (EIAR) and within the Construction and Environmental Management Plan (CEMP), Appendix 2-4 of the EIAR.

The SPMP outlines the overall design approach that has been applied to the proposed project to minimise peatland disruption and aims to ensure that all opportunities to minimise peat disturbance and extraction during construction will be taken. The SPMP identifies appropriate and industry proven methods for the reuse of excess peat to restore the effects of construction activities, without significant environmental or health and safety implications, to reduce the release of carbon and minimise risk in terms of human health.

1.1.1 Guidance

The legislation and guidance regarding the management of peat includes:

- Scottish Environment Protection Agency (SEPA), Regulatory Position Statement – Developments on Peat (2010);
- Scottish Government, Guidance on Developments on Peatland – Site Surveys (2014);
- Floating Roads on Peat, Scottish Natural Heritage (2011); and
- Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste, Scottish Renewables and SEPA (2014).

The following guidance specifically relates to wind farm construction and peatland:

- Investigating the impacts of wind farm development on peatlands in England: Part 1 Final Report (2011);
- Best Practice Guidance to Planning Policy Statement 'Renewable Energy' (2009);
- Wind Farm Developments on Peat Land fact sheet. Scottish Government (2011); and
- Good practice during wind farm construction, A joint publication by Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland (2015).

Many of the publications listed above have been developed by the Scottish Government. The Scottish documents are considered to be best practice in Ireland and are therefore appropriate for use within this SPMP.

The guidance identifies three main stages in the development process and describes what data should be gathered and assessed at each to inform a site specific SPMP:

- Stage 1: Environmental Impact Assessment (EIA);
- Stage 2: Post-consent / pre-construction; and
- Stage 3: Construction.

This SPMP has been prepared in accordance with the principles in the guidance for Stage 1 and proposes that prevention and re-use are the most appropriate means of managing peat excavated during construction at the proposed wind farm site. This report details the methodologies required to assess all potential surplus materials and presents the expected volume of excavated materials and required reuse volumes for reinstatement and restoration purposes.

1.2 PEAT DESCRIPTION

Organic material less than 0.5 m depth is not defined as peat. This is in accordance with guidance from:

- Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland states that *'Peat soil is an organic soil which contains more than 60 per cent of organic matter and exceeds 50 centimetres in thickness'*; and
- The James Hutton Institute define shallow peat as having *'a prescribed depth of organic matter of 50 – 100 cm*[1]*'*

Also, The Forestry Commission use 45 cm as the critical depth for peat to occur (*Understanding the greenhouse gas (GHG) implications of forestry on peat soils in Scotland*, 2010[2]);

- Peat can therefore be classified as organic material over 0.5 m in depth.

Peat can be separated into three main layers: acrotelm (the upper living layer), catotelm (the middle to lower layer) and occasionally amorphous (lower layer) peat:

- Acrotelm peat is the living layer of the peat including the peat turf or turve being a thin, vegetation mat layer. The acrotelm is found within the top layer of peat (often less than 0.5m) depending on the degree of decomposition and fibrous nature of the peat (H1 to H6 on the von post classification scale). The acrotelm is generally of high permeability, decreasing with depth. The water table fluctuates in this layer and conditions vary from aerobic to anaerobic. Material may be fibrous or pseudofibrous (plant remains recognisable), spongy, and when excavated strength is lost but retains integral structure and can stand unsupported when stockpiled >1m.
- Catotelm peat is the dead layer of peat found deeper than acrotelm peat which has some remnant plant structures. Material has high water content and is permanently below the water table (saturated) therefore organic matter decomposes anaerobically. Some plant structures may be recognisable but are highly humified losing most of their characteristics (approximately H6 to H9 on the von post classification scale) and

[1] https://www.hutton.ac.uk/learning/exploringscotland/soils/organicsoils

[2] https://www.forestresearch.gov.uk/publications/understanding-the-greenhouse-gas-ghg-implications-of-forestry-on-peat-soils-in-scotland/

strength. Water flow in the catotelm is slow unless peat structures such as sink holes or peat pipes are present.

The best management option to minimise potential surplus peat is to prevent its production. Therefore, the design of the proposed project has aimed to minimise peat excavation. Discussion of design considerations to avoid deeper areas of peat is included in Appendix 8-4: Peat Stability Risk Assessment and Chapter 3: Consideration of Alternatives of this EIAR.

SEPA has provided a hierarchy of management approaches in which the effectiveness of the approach to peat management is optimised at development sites as summarised below (SEPA 2010, SEPA 2012):

1. Prevention: avoiding generating excess peat during construction (e.g., by avoiding peat areas or by using construction methods that do not require excavation);
2. Re-use: use peat produced on site in habitat restoration of hardstanding or landscaping;
3. Recycling/recovery/treatment: modify peat produced on site for use as fuel, or as a compost/soil conditioner, or dewater peat to improve its mechanical properties in support of re-use; and
4. Storage: temporarily store peat on-site (for example, during short periods in the construction phase) and then re-use.

In relation to the SEPA guidance the following has been applied to the design and construction of the proposed project:

1. Reuse of material is proposed for landscaping and restoration of borrow pits;
2. Recycling/recovery is not appropriate on this site; and
3. Temporary storage and reuse are proposed on shallow gradients (<3 degrees and outside of borrow pits).

1.2.1 Peat Conditions on Site

The proposed wind farm site was assessed for peat vegetation in desktop review of maps and plans, site walkovers by ecologists and hydrologists in 2020 to 2025; and in 2021/2025 intrusive site investigation in terms of peat depth probing and coring across the proposed wind farm site and access track routes.

Peat, where present on the proposed wind farm site, is characterised by drained peatland i.e. degraded blanket bog (Plate 1). The land cover for the proposed wind farm site comprises of coniferous forestry and rough grassing in the surrounding area (Plate 3). Areas of turf cutting are evident with historical turf cutting within the site and active turf cutting in a number of turbary areas. The peat where present is relatively dry and overlies glacial subsoils i.e. clayey till and weathered bedrock. Areas of silty gravel and sandy till are evident as shown in Plate 2 below.

Plate 1 Peaty topsoil layer overlying shallow bedrock (Saddle hill area)

Plate 2 Peaty podzol topsoil layer over glacial till (near T10)

Plate 3 Gley-like soils to the centre and south of the proposed windfarm – near BP3

In Ireland, upland blanket bog tends to either completely conceal the underlying bedrock substrate or in areas of rugged geology, fills the hollows between areas of upstanding rock outcrop to form a discontinuous cover of highly variable peat depth. Review of peat landslide locations indicates that peat instability is overwhelmingly reported in the former setting rather than in areas of rock outcrop. Based on the site walkovers, peatland is generally filling the hollows and is discontinuous in most areas.

Based on a review of the peat probe data, the areas where excavation are <0.5m are very limited on south of the proposed wind farm site. It should be noted that the peat probe data appears to overestimate the depth of peat by 0.2 m to 0.5 m where the underlying soils comprise of soft glacial tills. Results from the SI confirm the peat on the proposed wind farm site has a relatively low moisture content and high shear vane strength values. The peat is fibrous and relatively easy to manage. No evidence of instability was noted on the proposed wind farm site. Turves (peaty topsoils) will be used to reinstate the borrow pits.

1.2.2 Construction Activities Covered by Spoil and Peat Management Plan

The proposed project is described in Chapter 2, Description of the Proposed Project. The proposed wind farm site is located northeast of Manorhamilton. The proposed wind farm site (Figure 1-2 of this EIAR) has an area of 911 ha and comprises an elongated land parcel approximately 5 km long in the north/south direction and is approximately 4 km wide in an east/west direction at the widest point.

The land use/activities on the proposed wind farm site are primarily commercial forestry, with some areas of open peatland/heathland that is grazed. Limited areas of peat were found to the south of the proposed wind farm site.

2. CONSTRUCTION ACTIVITIES

Peat management of the construction activities are covered individually in this report. The topography of the proposed wind farm site can be described as gradual to steeply rising ranging in elevation from 170 m to 380 m Above Ordnance Datum (AOD) with the eastern part of the site bordering Dough Mountain (462m). The northern turbines are situated within the Coillte property at elevations between 280 m and 350 m AOD generally in undulating terrain. The southern turbines are located between 170 m and 260m AOD. No peat was encountered along the TDR access road. To the north of the site, peat depths are varied.

The proposed wind farm site is covered with thick glacial deposits with drumlins/ribbed moraines, to the south the site resulting in local variations in topography. Very limited peat and peaty topsoil Podzols, peaty podzols) were encountered to the south of the proposed wind farm site.

2.1 EXCAVATIONS OF PEAT FOR INFRASTRUCTURE FOUNDATIONS

The material encountered in the trial pits excavated at each proposed turbine location was soft to stiff generally firm with depth - see Table 7-7, Chapter 7 (Soils and Geology) of the EIAR. Deeper excavations to more competent material will be required to construct the proposed turbine foundations.

During proposed turbine construction, peaty soils and peat will be excavated to the substrate to make room for the concrete turbine foundation, and for a small working area surrounding the foundation footprint. Typically, turbine bases are 28 m in diameter with detailed foundation design being dictated by the local ground conditions and the requirements of the turbine supplier.

Volume calculations provide an estimation of fill that will be required for all the proposed turbine foundations. Excavation of peat and subsoil will be required for construction of works for the installation of access roads. This will result in a permanent removal and relocation of cutover peat and subsoil.

The calculated volume of peaty soils is 101,911 m^3. In order to utilise and reuse the peaty soils, the construction works will be sequenced as follows:

- Construction works to commence to the south and centre of the site i.e. T6 to T14, substation, TDR access road and southern compounds;
- Construction of clear span bridges Br3-Br11 to the south of the site and access to substation;
- Construction material from BP2 and BP3 and external quarries will be utilised to construct T6 to T14;
- Construction of bridge across to T1 and Northern construction compounds;
- Stripping of peat and soils for T1/T5 and placement in BP1-BP3; and
- Reinstatement of borrow pits in a phased basis.

Peat or peaty soil will all be relocated within the proposed wind farm site. Due to the proposed phasing of the works, the southern section of the proposed wind farm site and upgrades to the

southern roads will be constructed first. The borrow pits will be available to accept material at the later stages of the construction works.

The proposed excavations will be battered at a 1:2 to 1:3 gradient. Once excavated, the proposed turbine foundation is installed, occupying a foundation footprint, approximately 28 m in diameter. The works at one turbine base require excavation through shallow peat to a competent founding stratum. This will be confirmed at detailed design stage following additional ground investigation.

Borrow Pits and deposition areas

Bedrock is present underlying the gravelly till. An initial walkover of the proposed wind farm site was undertaken, in September 2022 and a review of the wind farm site investigations has been carried out. There are three areas considered for the borrow pit locations. With a excavation in the area, material up to 8.0 m bgl. A summary of potential volumes is included in **Error! Reference source not found.**.

Table 2-1: Borrow Pit - Potential Material Volumes and Summary of the Area Characteristics

Borrow Pit Ref No.	Material Type	Depth minus Overburden	Potential Volume (m^3)[3]	Ecological/Other Constraints
BP1	Class1/2 soils, Sandstone bedrock	(3 m – 1 m) 2 m of available material	21,600 m^3 Overburden 13,500 m^3	No significant constraints, average 0.5 m peat/soft sediment encountered
BP2	Sandstone bedrock	(8 m – 1.5 m) 6.5 m of available material	174,720 m^3 Overburden 50,400 m^3	No significant constraints, average <0.5m peat / soft sediment encountered
BP3	Class1/2, Sandstone bedrock	(6 m – 1.5 m) 4.5 m of available material	51,847 m^3 Overburden 21,603 m^3	No significant constraints, no peat encountered

Similarly, hardstanding for cranes and other infrastructure foundations on the proposed wind farm site are to be founded on material underlying peat deposits which will also require excavation through peat. A crane hardstanding is required adjacent to each proposed turbine for the purpose of turbine installation and maintenance. Each crane pad has an area of 25 m x 40 m and will require the full excavation of peat (where present) to substrate and replacement

[3] Conservatively assumes 80% usage for bedrock

with rock is required to provide a suitably stable surface for turbine component handling. Once excavated, peat will be re-used to batter the edges of platforms grading the bases into the local topography.

Full excavation of peat (where present) to substrate and replacement with rock is required to provide a suitably stable surface for turbine placement. Once excavated, peat will be re-used to batter the edges grading the bases into the local topography.

2.2 Excavations for the Underground Cable

The proposed wind farm site will connect to the grid via an underground cable along onsite access tracks and the public road corridor.

It is proposed to excavate the trenches for the underground cable at a uniform level in peat or overburden material. The trenches will typically be 600 mm wide and 1250 mm deep with variations on this design to adapt to bridge crossings, culvert crossings, service crossings and watercourse crossings, etc.

2.3 Construction of New Tracks

2.3.1 Track Construction Types

To provide access within the site and to connect the proposed wind turbines and associated infrastructure new tracks will need to be constructed. The identification of the access track layout is an iterative procedure. While the majority of tracks on the proposed wind farm site will be constructed on mineral soil, there are some locations where construction on peat and peaty soils will be required.

The track construction preliminary design has considered the following key factors:

- Requirement to minimise disruption to peat/soil hydrology;
- Minimise excavation arisings;
- Serviceability requirements for construction and wind turbine delivery and maintenance vehicles; and
- Buildability considerations.

Whilst the above key factors are used to determine the proposed track design, the actual construction technique employed for a particular length of track will be determined on the prevailing ground conditions encountered along that length of track.

Proposed access tracks will be constructed to enable the construction works to take place and to provide access to turbine locations and infrastructure of the proposed wind farm site. The proposed tracks will be constructed using unbound crushed aggregates and incorporate drainage to maintain the performance of the pavement during wet weather. All of the tracks will be constructed as founded tracks. Founded tracks are excavated down to and constructed up from a competent geological stratum with adequate cross drainage to prevent water accumulation on the upgradient side. Ground investigations in the form of peat probing and trial pitting has been carried out along the proposed access routes to inform the depth of excavation and upfill required for the access tracks.

2.4 General Access Track Construction Techniques

Prior to the construction of any access tracks on the proposed wind farm site a detailed design will need to be carried out. Given the topography and relatively shallow peat on the proposed wind farm site, excavated access tracks are deemed an appropriate construction technique for the majority of the proposed wind farm site.

This methodology includes procedures that are to be included in the construction phase to minimise any adverse impact on peat stability. The methodology is not intended to cover all aspects of construction such as drainage and environmental considerations.

- Interceptor drains will be installed upslope of the access track alignment to divert any surface water away from the construction area;
- Proposed excavation of tracks shall be to the line and level given in the design requirements. Excavation will take place to a competent stratum beneath the peat (as agreed with the proposed wind farm site designer);
- Track construction will be carried out in sections of approximately 50 m lengths; i.e. no more than 50 m of access track will be excavated without re-placement with stone fill unless otherwise agreed with the resident engineer on the proposed wind farm site;
- All excavated peat shall be placed/spread alongside the excavations;
- Side slopes in peat shall be not greater than 1 (v): 2 or 3 (h). This slope inclination will be reviewed during construction, as appropriate. Battering of the side slopes of the excavations will be carried out as the excavation progresses;
- The surface of the finished excavated access track will be finished above current ground level;
- A layer of geogrid/geotextile may be required at the surface of the competent stratum (to be confirmed by the designer);
- Where slopes of greater than 5 degrees are encountered along with relatively deep peat (i.e. greater than 1 m) and where it is proposed to construct the access track perpendicular to the slope contours it is best practice to start construction at the bottom of the slope and work towards the top. This method avoids any unnecessary loading to the adjacent peat and greatly reduces risk of peat instability; and
- A final surface layer shall be placed over the excavated track, as per design requirements, to provide a track profile and graded to accommodate wind turbine construction and delivery traffic.

Access tracks to the proposed wind farm site require careful monitoring to ensure that there is no significant standing water forming, which would lead to potholes in the surface. If areas of track are causing concern, repairs will be carried out in favourable, preferably dry, conditions, to ensure that there is no saturation of the surface of the track.

3. EXCAVATION AND STORAGE OF ARISINGS

The handling, storage and re-use of excavated materials are of importance during the construction phase of the proposed project. The majority of the site is on forestry lands with some areas under agricultural production. It is intended that peat soils (101,911 m^3) will be placed at the borrow pit areas.

Any surplus soil and topsoil excavated material will be reused, either in profiling/landscaping or constructing berms close to the excavation areas. The proposed wind farm site has been extensively drained and afforested resulting in well drained and extensively trafficked peat and soils.

3.1.1 Excavation & Storage of Arisings Methodology

This methodology includes procedures that are to be included in the proposed construction phase to minimise any adverse impact on peat and soil stability. The methodology is not intended to cover all aspects of construction such as drainage and environmental considerations.

Prior to any excavations, the Principal Contractor will produce a detailed Method Statement identifying where and how excavated peat will be used in reinstatement or landscaping works. Specific requirements for the excavation, handling, storage and reinstatement of peat will be outlined in a detailed Method Statement. The Principal Contractor will consider potential impacts on downstream receptors and the potential for instability issues with the excavated material.

Some of the requirements to be contained within this are outlined below. The majority of the proposed wind farm site comprises bare peat with some areas where revegetation is occurring. Areas of peat within the footprint of excavation will have the top layer of vegetation stripped prior to construction by an experienced specialist contractor. Underlying peat or bare peat will then be removed.

Classification of excavated materials will depend on their identified re-use in reinstatement works. At the proposed wind farm site it is anticipated that the material to be excavated will comprise peat and mineral subsoil.

3.2 SUMMARY OF EXCAVATED PEAT VOLUMES ON SITE

A summary of the excavated peat volumes calculated for the proposed wind farm site is provided in Table 3-1. The quantity of peat to be excavated has been estimated based on high-level volumetric calculations using peat probe data, providing a conservative figure for planning purposes. Peat probe data can overestimate peat depths as the total probed depth may include underlying non-peat mineral soils due to the testing method, meaning the actual volume of peat material requiring storage in borrow pits will likely be significantly less than calculated. Due to the significantly lower density of peat (typically 0.1–0.2 tonnes/m^3) compared to bedrock (1.92 tonnes/m^3), a greater volume of peat can be accommodated in borrow pits using the same mass removed.

Table 3-1: Excavation Volume Summary[4]

	Average Peat or Peaty topsoil depth	Hardstand area m^2	Total m^3
Substation	0.0	24,281	0
T1	1.0	7,765	7765
T2	1.6	7,765	12424
T3	0.3	7,765	2329.5
T4	0.9	7,765	6988
T5	0.4	7,765	3106
T6	0.4	7,765	3106
T7	0.3	7,765	2329.5
T8	1.0	7,765	7765
T9	0.8	7,765	6212
T10	0.2	7,765	1553
T11	0.2	7,765	1553
T12	0.3	7,765	2329.5
T13	0.3	7,765	2329.5
T14	0.4	7,765	3106
Roads	0.2	43,725	8745
Borrow Pit 1	0.5	13,500	6750
Borrow Pit 2	0.5	33,600	16800
Borrow Pit 3	0.0	14,402	0
Compound 1	0.1	16800	1,680
Compound 2	0.3	16800	5,040
			101,911

3.2.1 Peat Excavation Method

Areas of peat on the proposed wind farm site are shallow or not present to the south with variable peat depths to the north. The following methodologies for excavation of peat are recommended:

- Specific requirements for the excavation, handling, storage and reinstatement of peat will be outlined in this Method Statement. The Contractor will consider potential impacts on downstream hydrological receptors and also the potential for instability issues with the excavated material. The contractor will implement the mitigation measures set out in the Land and Soils chapter (Chapter 7).
- Areas of peat will have the top layer of vegetation stripped off as turf prior to construction by an experienced specialist contractor. When excavating areas of peat, excavated turfs will be as intact as possible.
- Excavated soils and turfs will be handled so as to avoid cross contamination between distinct horizons and ensure reuse potential is maximised.
- Care will be taken when stripping and removing topsoil and peat turfs and appropriate storage methods used on the proposed wind farm site, i.e. excavated material will be stored in separate horizons and vegetation rich top layers will be stored vegetation side up.

[4] Assuming full replacement

- Classification of excavated materials will depend on their identified re-use in reinstatement works. At the proposed wind farm site, it is anticipated that the material to be excavated will comprise peat (which may be sub-divided into peaty soils, peat and mineral soils (subsoil and topsoil)).

3.2.2 Temporary Storage

Temporary storage of excavated soils will only occur where peat thickness is minimal or absent. It is proposed that any temporary onsite stockpiles of soil, rock and other excavated material shall be removed and utilised in the site reinstatement programme to infill any excavated areas which will then be mounded and capped with sod prior to the completion of works.

The majority of the peat on site is located to the north of the site. Based on the volume of peaty soils/peat encountered at T1 to T5, a total of 32,613 m^3 will require excavation from these proposed turbine bases. The peat soils will be transported to the borrow pit/deposition area. Peat material will be used to reinstate the borrow pit areas.

Mineral soil, may be temporarily stored on the proposed wind farm site. In this case, the following good practice applies:

- Excavated material will not be stored adjacent to turbine bases, on or adjacent to slopes (>5 degrees gradient), or in areas of peat.
- Diffuse drainage lines and locally steep slopes should be avoided for peat storage; and
- Stored upper turves (incorporating vegetation) will be organised and stored according to soil type.

For borrow pits and compounds (with longer term storage requirements), the following applies:

- Peat generated from crane pad locations will be transported directly to its allocated restoration location, to minimise the volume being stockpiled with the possibility of drying out;
- Stored peat will be stored and placed at the borrow pit below the current land profile to promote stability;
- Monitoring of areas of peat storage during wet weather; and
- No permanent stockpiles will be left on the proposed wind farm site after the completion of the construction phase works.

Transport

- Movement of peaty soils will be kept to a minimum once excavated, and therefore it is preferable to transport peat planned for reinstatement to its destination at the time of excavation;
- Carefully evaluate potential restoration sites, such as borrow pits, and agree phasing as appropriate with the ECoW, landowners and relevant consultees; and
- Undertake restoration and revegetation work as soon as possible.
- Spoil will be deposited, in layers of 0.50 m and will not exceed a total thickness of 1.5m.

After completion of the turbine base reinstatement works all remaining stockpiles are to be removed for permanent disposal at the proposed borrow pit areas within the proposed wind farm site.

3.2.3 Excavated Rock and Glacial subsoils

Stone and soil material will be excavated during proposed construction. This will be used under and around key infrastructure including the proposed turbines, substation, site roads, hardstands and construction compounds. By sourcing stone from the onsite borrow pits, the volume of traffic that will occur on public roads in the area will be significantly reduced. Stone from offsite sources will be used for surface dressing, while stone sourced onsite will be used for the initial capping layer. Further information on the proposed traffic volumes and impacts are discussed in Chapter 16 of this EIAR (Traffic & Transportation).

Hardstands and site roads will be constructed to be above the existing ground level. The lower layer (approx. 400 mm) of this will be lower grade stone, with the top 150 mm being a higher quality compacted aggregate. The surplus excavated material (101,911 m^3) will be used to complete the backfilling of the borrow pit. Approximately, 120,608 m^3 of rock material will be required. The calculated quantity of available material from the borrow pits equates to 248,167 m^3, with sufficient storage capacity for the excavated material.

3.3 General Recommendations for Good Construction Practice

The recommendations of the PSRA are incorporated into this document and summarised below. The following outlines an overview of the tasks for the proposed construction phase:

- Client's Geotechnical Engineer to provide a Geotechnical Induction to all contractor supervisory staff.
- Client to appoint a Site Geotechnical Supervisor to carry out supervision of the proposed wind farm site works as required. The Site Geotechnical Supervisor will be required to inspect that works are carried in accordance with the requirements of the PSRA, identifying new risks and ensuring all method statements for works are in place and certified.
- Retain a Site Geotechnical Folder which contains all the information relevant to the geotechnical aspects of the proposed wind farm site including but not limited to risk register, site investigation information, method statements etc.
- Contractor to develop a Method Statement for the works to be carried out in each of the PSRA areas in compliance with the required mitigating measures.
- Client's Geotechnical Engineer/Site Geotechnical Supervisor to approve the method statement.
- Contractor to provide toolbox talks and on-site supervision prior to and during the works.
- Daily sign off by supervising staff on completed works.
- Implementation of emergency plan and unforeseen event plan by the contractor.

3.3.1 Operation and Maintenance Phase:

The following outlines an overview of the tasks for the proposed operation and maintenance phase:

- Communication of residual stability risk to appropriate site operatives.
- Ongoing monitoring of residual risks and maintenance if required. Such items would consist of regular inspection of drains and culverts to prevent blockages and inspections

of specific areas such as settlement ponds and access roads after a significant rainfall event.

- Routine inspection of the proposed wind farm site by contractor to include an assessment of ground stability conditions (e.g. cracking, excessive track settlement, disrupted surface, closed-up drains) and drainage conditions (e.g. blocked drains, absence of water in previously flowing drains, springs, etc).
- An identified feature will be assessed and added to the Risk Register

3.3.2 Decommissioning Phase:

All above proposed ground infrastructure will be disassembled and remaining infrastructure will remain in place, therefore very limited excavations will be required for decommissioning.

4. MONITORING

To monitor possible peat/soil movements, it is proposed to install sighting posts upslope and downslope of the access track at staggered intervals at locations where the peat depth is greater than 1.0m. Details of sighting posts are given below. Areas adjacent to the access roads at T1 to T5 should be fenced off to allow for the reestablishment of peatland and heath habitats along the access road and avoid peat hagging or erosion due to sheep grazing. The fenced area should be monitored on a biannual basis.

4.1.1 Excessive Movement

Where there is excessive movement or continuing peat movement recorded at a monitoring location or identified at any location within the proposed wind farm site but no apparent signs of distress to the peat (e.g. cracking, surface rippling) then the following shall be carried out.

- All activities (if any) shall cease within the affected area;
- Increased monitoring at the location shall be carried out. The area will be monitored, as appropriate, until movements have ceased; and
- Re-commencement of activities shall only start following a cessation of movement and agreement with all parties.

4.1.2 Onset of Peat Slide

Due to the drained cutaway nature of the proposed wind farm site, the risk of a regional scale landslide is low/negligible as detailed in the PSRA. In the event of a localised peat movement the following measures will be put in place. Where the onset or actual detachment of peat (e.g. cracking, surface rippling) then the following shall be carried out:

- On alert of a peat slide incident, all activities (if any) in the area will cease and all available resources will be diverted to assist in the required mitigation procedures, as outlined in the Peat Stability Risk Assessment (Appendix 7-1).
- Where considered possible, actions outlined in the Peat Stability Risk Assessment (Appendix 7-1), will be taken to prevent a peat slide reaching any watercourse. This will take the form of the construction of check barrages on land; and
- All relevant authorities will be notified if a peat slide event occurs on the proposed wind farm site.

For localised peat slides which have essentially come to rest, the area will be stabilised initially by rock infill, if required. The failed area and surrounding area will then be assessed by the engineering staff and stabilisation procedures implemented. The area will be monitored, as appropriate, until movements have ceased.

www.tobin.ie