



APPENDIX 4-5

**CONSTRUCTION AND
ENVIRONMENTAL
MANAGEMENT PLAN**



DOCUMENT DETAILS

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1.

INTRODUCTION

This Construction and Environmental Management Plan (CEMP) has been prepared by MKO to support the Environmental Impact Assessment Report (EIAR) which accompanies the planning application for the Cunlaghfadda Green Energy Project in Co. Mayo (the Proposed Project), which includes 7 no. wind turbines and all associated infrastructure and works. The Proposed Project is located approximately 5.3km northwest of the town of Claremorris, and 16km southeast of the town of Castlebar. The full description of the Proposed Project is detailed in Chapter 4 of the EIAR.

As detailed in Section 1.1.1 in Chapter 1, for the purposes of this EIAR, the following references are used: 'Proposed Project', 'Proposed Wind Farm', 'Proposed Grid Connection' and 'Site'. Please see Section 1.1.1 of this EIAR for further details. A detailed description of the Proposed Project is provided in Chapter 4 (Description of the Proposed Project) of this EIAR.

The CEMP has been prepared in conjunction with the EIAR and the NIS which accompany the planning application for the Proposed Project to the competent authority. Should the Proposed Project secure planning permission, the CEMP will be updated, in line with all conditions and obligations which apply to any grant of permission. The CEMP should be read in conjunction with the EIAR, NIS and planning drawings. The CEMP will also require updating by the selected contractor in order to identify, assess and satisfy the contract performance criteria as set out by the various stakeholders. The CEMP due to its structure and nature will also require constant updating and revision throughout the construction period as set out below. Therefore, this is a working document and will be developed further prior to and during the construction phase of the Proposed Project.

Triggers for amendments to the CEMP will include:

- Response to any specific requirements arising from conditions attached to a grant of planning permission.
- When there is a perceived need to improve performance in an area of environmental impact;
- As a result of changes in environmental legislation applicable and relevant to the Proposed Project;
- Where the outcomes from auditing establish a need for change;
- Where Work Method Statements identify changes to a construction methodology to address high environmental risk; and
- As a result of an incident or complaint occurring that necessitates an amendment.

This CEMP identifies the key planning and environmental considerations that must be adhered to and delivered during site construction and operation. The Contractor, as appointed by the Project Developer, will be required to implement all of the requirements set out in this CEMP. The CEMP may be updated and revised throughout the construction phase of the Proposed Project, but all future iterations must meet or exceed the standards and requirements set out in this document and the Project Developer must be satisfied that all requirements set out in this document can and will be implemented in full by the appointed contractor.

The CEMP to be prepared by the appointed contractor will be a single, amalgamated document that can be used during the construction phase of the Proposed Project, as a single consolidated point of reference relating to all construction, environmental and drainage requirements for the Planning Authority, developer and contractors alike. The CEMP may evolve over further iterations as the construction works progress, but at all times must meet or exceed the standards and requirements set out in this document. It will be the contractor's current version of the CEMP, which at any point in time, will guide the construction activities on site and the implementation of which will be audited by an Environmental Clerk of Works (ECOW).

1.1

Scope of the Construction and Environmental Management Plan

This CEMP is presented as a guidance document for the construction of the Proposed Project.

The Proposed Project is located within the EIAR Site Boundary or the 'Site' which measures approximately 165 hectares (ha). The Proposed Project layout is illustrated on Figure 2-3 below.

A detailed description of the Proposed Project is provided in Chapter 4 of the EIAR.

This CEMP is divided into ten sections, as outlined below.

Section 1 provides a brief introduction as to the scope of the report.

Section 2 outlines the Site and Proposed Project details, detailing the targets and objectives of this plan along with providing an overview of construction methodologies and management practices that will be adopted throughout the Proposed Project.

Section 3 sets out details of the environmental controls to be implemented on site. Site drainage principles, traffic management, dust control, invasive species management and a waste management plan are also included in this section.

Section 4 sets out a fully detailed implementation plan for the environmental management of the Proposed Project outlining the roles and responsibilities of the project team.

Section 5 outlines the general Health and Safety measures that will be implemented on site during the construction phase of the Proposed Project.

Section 6 outlines the Emergency Response Procedure to be adopted in the event of an emergency in terms of site health and safety and environmental protection.

Section 7 consists of a summary table of all mitigation proposals to be adhered to during the Proposed Project, categorised into three separate headings, 1) pre-commencement measures; 2) construction-phase measures and 3) operational-phase measures.

Section 8 consists of a summary table of all monitoring requirements and proposals to be adhered to during the Proposed Project, categorised into three separate headings, 1) pre-commencement measures; 2) construction-phase measures and 3) operational-phase measures.

Section 9 sets out a programme for the timing of the works.

Section 10 outlines the proposals for reviewing compliance with the provisions of this report.

1.2

Targets and Objectives

The following key targets and objectives will inform the final detailed design should the Proposed Project secure planning permission and proceed to the construction phase. This includes consideration of the buildability of the designs that emerge:

- Ensure construction works and activities are completed in accordance with mitigation and best practice approach presented in the EIAR, NIS and associated planning documentation;
- Ensure construction works and activities have minimal impact/disturbance to local landowners and the local community;

- Ensure construction works and activities have minimal impact on the natural environment;
- Adopt a sustainable approach to construction and, ensure sustainable sources for materials supply where possible; and,
- Provide adequate environmental training and awareness for all project personnel.

The key site objectives are as follows:

- Using recycled materials if possible, e.g. excavated stone and overburden;
- Ensure sustainable sources for materials supply where possible;
- Avoidance of any pollution incident or near miss as a result of working around or close to existing watercourses and having emergency measures in place;
- Avoidance of vandalism;
- Keeping all watercourses free from obstruction and debris;
- Correct implementation of the sustainable drainage system (SuDS) drainage design principles;
- Keep impact of construction to a minimum on the local environment, watercourses, and wildlife;
- Correct fuel storage and refuelling procedures to be followed;
- Good waste management and house-keeping to be implemented;
- Air and noise pollution prevention to be implemented;
- Monitoring of the works and any adverse effects that it may have on the environment. Construction Methods and designs will be altered where it is found there is an adverse effect on the environment;
- Comply with all relevant water quality legislation listed throughout this document; and,
- Ensure a properly designed, constructed and maintained drainage system appropriate to the requirements of the Site is kept in place at all times.

2. SITE AND PROPOSED PROJECT DETAILS

2.1 Site Location

The Site is located within a rural, agricultural setting in Co. Mayo, approximately 5.3km northwest of the town Claremorris, and 16km southeast of the town of Castlebar. The settlement of Mayo Abbey is located approximately 2.3km northwest of the Site.

The Proposed Grid Connection includes for underground 110kV electrical cabling from the proposed onsite 110kV substation, in the townland of Cloonbaul, Co. Mayo to connect into the existing Cloon-Castlebar 110kV Overhead Line (OHL) which runs from the northwest to the southeast adjacent to the site in the townland of Cloonbaul, Co. Mayo. The Proposed Grid Connection will facilitate the connection of the Proposed Wind Farm to the national electricity grid.

The Site measures approximately 165ha and comprises a mix of agri-pastoral land and cutover bog. Existing access is via an existing agricultural entrance off the L1506 local road northeast to southeast orientation; the road will also be upgraded and widened for access to the Site. The Site is also served by a number of existing agricultural roads and tracks. The Grid Reference co-ordinates for the approximate centre of the Site are X528746 Y778058 (ITM).

Current land-use on the Site is predominantly agricultural pastures and rough grazing, with areas of turbary lands used for private peat cutting and private forestry also present. Current land-use along the Proposed Grid Connection comprises of pastures and private land principally used by agriculture. Land-use in the wider landscape comprises a mix of pastoral agriculture and low-density residential.

A full and detailed description of the Proposed Project (i.e. the Proposed Wind Farm and the Proposed Grid Connection) for the purposes of the planning application and the additional elements that form part of the overall project, assessed in the EIAR, is contained in Chapter 4 of the EIAR.

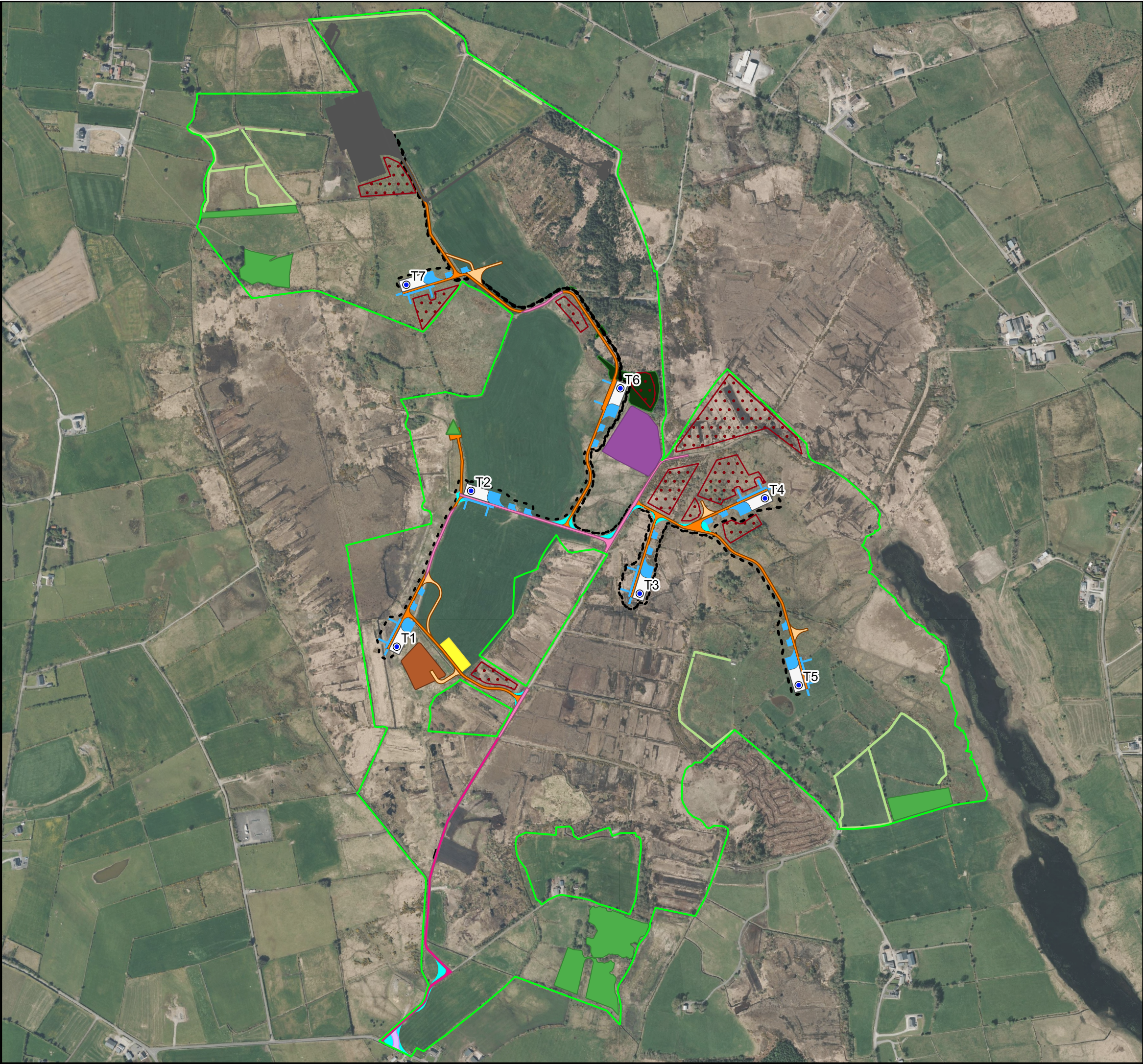
The townlands in which the Proposed Project is located are listed in Table 1-1 in Chapter 1. All townlands are located in Co. Mayo.

2.2

Description of the Proposed Project

A detailed description of the Proposed Project is provided in Chapter 4 (Description of the Proposed Project) of this EIAR.

The Proposed Wind Farm layout is shown in Figure 2-1. The Proposed Grid Connection layout is illustrated on Figure 2-2. Figure 2-3 illustrates the overall layout of the Proposed Project (i.e. the Proposed Wind Farm and Proposed Grid Connection together). Detailed site layout drawings of the Proposed Project are included in Appendix 4-1 to the EIAR.



- Map Legend
- EIAR Site Boundary
 - Proposed Turbines
 - Proposed Turbine Hardstands
 - Temporary Hardstand Areas
 - Proposed Borrow Pit
 - Peat and Spoil Management Areas
 - Proposed Met Mast
 - Proposed Internal Cables
 - Proposed Felling
 - Proposed Upgrade to Existing Access Tracks
 - Proposed New Access Tracks
 - Proposed Upgrade to Public Road
 - Temporary Construction Tracks
 - Temporary Site Entrance
 - Temporary Widening Areas
 - Proposed Passing Bay
 - Proposed Marsh Fritillary Enhancement Areas
 - Proposed Woodland Planting
 - Linear Planting and Enhancement
 - Separate S182a Infrastructure



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Drawing Title
Proposed Wind Farm

Project Title
Proposed Cunlaghfadda Green Energy Project

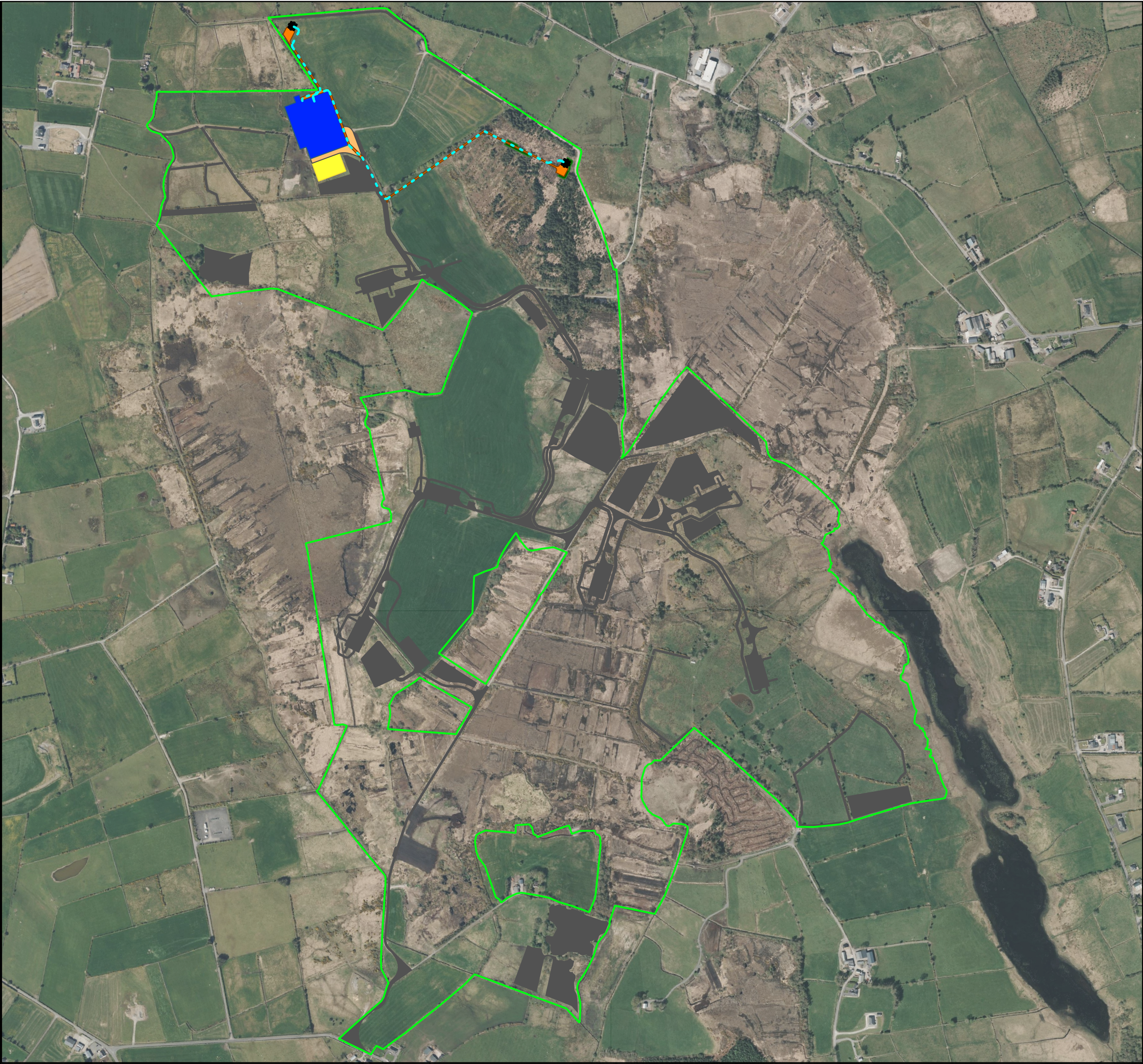
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Map Legend

EIAR Site Boundary

 Proposed 110kV Substation

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Drawing Title

Proposed Grid Connection

Project Title

Proposed Cunlaghfadda Green Energy Project

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Drawing No.

Figure 2-2

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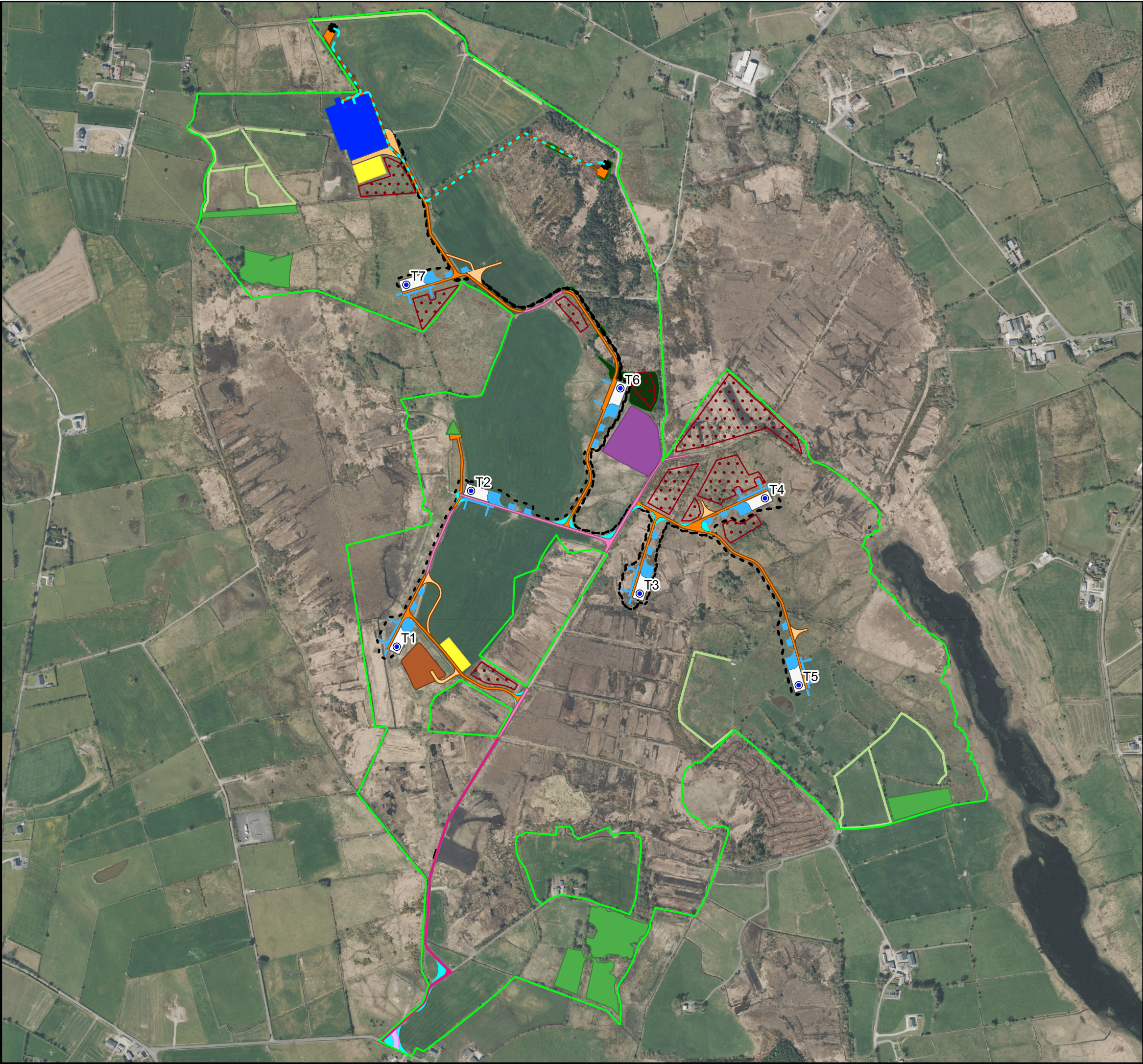
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Map Legend

EIAR Site Boundary

Proposed Turbines

Proposed Turbine Hardstands

Temporary Hardstand Areas

Proposed Borrow Pit

Peat and Spoil Management Areas

Proposed Met Mast

Proposed Internal Cables

Proposed Felling

Proposed 110kV Substation

Proposed Construction Compound

Proposed 110kV Grid Connection Cable Route

Proposed End Masts

Proposed Upgrade to Existing Access Tracks

Proposed New Access Tracks

Proposed Upgrade to Public Road

Temporary Construction Tracks

Temporary Site Entrance

Temporary Widening Areas

Proposed Passing Bay

Proposed Marsh Fritillary Enhancement Areas

Proposed Woodland Planting

Linear Planting and Enhancement

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Drawing Title

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Project Title

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Figure 2-3

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2.3 Construction Management Practices Overview

2.3.1 Introduction

An experienced main contractor will be appointed for the civil works for the construction phase of the Proposed Project. The appointed contractor for the works will be required to comply with this CEMP and any revisions made to this document in the preparation of method statements for the various elements of the construction phase of the Proposed Project. An overview of the proposed Construction Management Practices is provided below.

2.3.2 Overview of Proposed Construction Management Practices

The EIAR includes construction methodologies and management practices for various elements of work to be undertaken as part of the Proposed Project. Detailed construction methodologies are reproduced in the relevant sub-sections but will be superseded by an appointed contractor's construction method statements, which will form part of the CEMP. The following sections also outline the construction and environmental management practices to be deployed during the construction phase. The contractor's construction method statements will be prepared to take account of the detailed engineering, geotechnical and detailed drainage design which will be prepared prior to commencement of construction and all requirements of this CEMP.

Proposed Wind Farm:

- Turbine Foundations,
- Turbine Hardstanding Areas;
- Electrical and Communications Cabling;
- Temporary Construction Compound;
- Meteorological Mast Foundation;
- Site Access Tracks (Upgrade to existing tracks, new permanent access tracks, temporary construction tracks, upgrade to public road L15053, passing bay);
- Site Entrance Management;
- Temporary Security Cabins;
- Borrow Pit;
- Peat and Spoil Management Areas;
- Tree Felling;
- Biodiversity Management and Enhancement Measures;
- Site Drainage System;

Proposed Grid Connection:

- Onsite 110kv Electricity Substation and Control Buildings;
- Temporary Construction Compound;
- New Site Access Tracks and Hardstand Areas;
- Underground Electrical (110kV) and Communication Cabling;
- 2 no. New End Masts.

2.3.3 Proposed Wind Farm

2.3.3.1 Turbine Foundations

Each wind turbine is secured to a reinforced concrete foundation that is installed below the finished ground level. The size of the foundation will be dictated by the turbine manufacturer, and the final turbine selection will be the subject of a competitive tender process. Different turbine manufacturers use different shaped turbine foundations, ranging from circular to hexagonal and square, depending on the requirements of the final turbine supplier. The turbine foundation transmits any load on the wind turbine into the ground. The maximum horizontal and vertical extent of the turbine foundation will be 25m and 3.5m respectively, which has been assessed in the EIAR.

After the foundation level of each turbine has been formed on competent strata (i.e. bedrock or subsoil of sufficient load bearing capacity), the “Anchor Cage” is levelled, and reinforcing steel is then built up around and through the anchor cage. The outside of the foundation is shuttered with demountable formwork to allow the pouring of concrete and is backfilled accordingly with appropriate granular fill to finished surface level following completion of the foundation.

The formation level of the turbine foundations will be on the lower mineral subsoil or bedrock. They will be formed at a suitable level directed by the Geotechnical Engineer/Designer. The foundations will be constructed as follows:

1. *The extent of the excavation will be marked out and will include an allowance for trimming the sides of the excavation to provide a safe working area and slope batter;*
2. *Where practical, the soil will be stripped over the area of the excavation and stored locally for reuse, the subsoil will be excavated and stored to one side for reuse during the landscaping around the finished turbine;*
3. *No material will be removed from the Site with excavated peat and spoil being transported to the identified peat and spoil management areas or for backfilling the borrow pit within the Site.*
4. *All groundwater and surface water arising from turbine base excavation will be pumped to the dirty water system prior to discharge from the works area;*
5. *Soil excavation shall be observed by a qualified archaeologist in accordance with a scheme of archaeological monitoring to identify any significant remains as they come to light;*
6. *The foundations excavation will be raised to formation level by compacted layers of well graded granular material will be spread and compacted to provide a hard area for the turbine foundation.*

Standard excavated reinforced concrete bases will be completed as follows:

1. *A layer of lean-mix blinding will be laid approximately 75mm thick directly on top of the newly exposed formation, tamped and finished with a screed board to leave a flat level surface. The concrete should be protected from rainfall during curing and all surface water runoff from the curing concrete should be prevented from entering surface water drainage directly;*
2. *High tensile steel reinforcement will be fixed around the anchor cage in accordance with the designer’s drawings & schedules. The foundation anchorage system will be installed, levelled and secured to the blinding using steel box section stools;*
3. *Ductwork will be installed as required, and formwork erected around the steel cage and propped from the backside as required;*

4. *The foundation anchorage system will be checked both for level and line prior to the concrete being installed in the base. These checks will be passed to turbine manufacturer for their approval;*
5. *Concrete will be placed using a concrete pump and compacted when in the forms using vibrating pokers to the levels and profile indicated on the drawings. Upon completion of the concreting works the foundation base will be covered and allowed to cure;*
6. *Steel shutters will be used to pour the circular chimney section;*
7. *Earth wires and drainage pipes will be placed around the base;*
8. *The foundation will be backfilled with a cohesive material, where possible using the material arising during the excavation or imported material and landscaped using the soil set aside during the excavation; and.*
9. *No excavated material will be removed from the Site with excavated peat and spoil being transported to the identified peat and spoil management areas within the Site.*

2.3.3.2 Turbine Hardstanding Areas

Hard standing areas consisting of levelled and compacted hardcore are required around each turbine base to facilitate access, turbine assembly and turbine erection. The hard-standing areas are used to accommodate cranes used in the assembly and erection of the turbine, offloading and storage of turbine components, and provide a safe, level working area around each turbine position. The hard-standing areas are extended to cover the turbine foundations once the turbine foundation is in place. All crane hardstand areas will be designed taking account of the loadings provided by the turbine manufacturer and will consist of a compacted stone structure. The main body of the crane hardstands (i.e permanent footprint not including the blade fingers and turbine foundation) will be constructed in a similar manner to the excavated site roads. The turbine hardstand area will measure approximately 25m x 50m.

The precise sizes, arrangement and positioning of hard standing areas are dictated by turbine suppliers. The proposed hard standing areas are illustrated in the detailed drawings included in Appendix 4-1 of the EIAR. The extent of the required areas at each turbine location may be optimised on-site depending on topography, position of the Site access track, the proposed turbine position and the turbine supplier's exact requirements.

2.3.3.3 Site Entrance Management

Temporary Construction and Turbine Component Entrance

A temporary site entrance will be constructed adjacent to the L-1505, in the southeast of the Site for the duration of the construction phase. See Figure 4-32 of Chapter 4 for further detail. This entrance will facilitate the delivery of the turbine components, abnormal loads and construction traffic. Traffic management measures will be implemented for the duration of the construction phase. This new entrance measures approx. 480m² and was subject to autotrack assessment to identify the turning area required, as described in Chapter 15, Section 15.1 of the Traffic and Transport Assessment. Appropriate sightlines will be established to the east and west of the proposed turbine component entrance for the safe egress of traffic.

This temporary entrance will only be used for the construction phase, with it being reseeded or allowed to revegetate naturally, as appropriate, following the completion of construction. Should this entrance be required during the operational phase for any maintenance works, this entrance can be reinstated, as required.

Operational Entrance

As can be seen in Figure 2-3, the L15053 is located within the Site and will be upgraded during the construction phase of the Proposed Wind Farm. Operational traffic will travel on the L1505, turning on to the L15053 towards the Site for approximately 800m before reaching the proposed operational site entrance in the townland of Cloonbaul, please see Figure 4- 32 of Chapter 4 for further detail.

This operational entrance will be gated using a steel barrier or stock-proof fencing and will be constructed with appropriate sight lines (as detailed in Section 15.1 of this EIAR) in order to safely facilitate the egress and ingress of traffic.

During the operational phase this entrance will be used to facilitate maintenance and monitoring activities on the Site. This operational access will also be used by Eirgrid for maintenance access to the 110kV substation.

2.3.3.4 Meteorological Mast Foundation

One meteorological (met) mast is proposed as part of the Proposed Wind Farm. The met mast will be equipped with wind monitoring equipment at various heights. The proposed met mast will be located at E528428, N778335 (ITM) as shown on the Site layout drawing in Figure 2-1 and the detailed site layout drawings included as Appendix 4-1. The met mast will be a free-standing slender lattice structure 92m in height. It will be constructed on a hard-standing area sufficiently large to accommodate the equipment that will be used to erect the mast. A standard detail of a meteorological mast is shown in Figure 4-8 of Chapter 4 of the EIAR.

The met mast foundation will be formed at a suitable level directed by the Geotechnical Engineer/Designer. The foundation area will be prepared as follows:

- i. The extent of the excavation will be marked out and will include an allowance for trimming the sides of the excavation to provide a safe working area and slope batter;*
- ii. Where practical, the soil will be stripped over the area of the excavation and stored locally for reuse, the subsoil will be excavated and stored to one side for reuse during the landscaping around the finished met mast;*
- iii. No material will be removed from the Site with excavated Peat and spoil being transported to the identified peat and spoil management areas within the Site.*
- iv. All groundwater and surface water arising from met mast base excavation will be pumped to the dirty water system prior to discharge from the works area;*
- v. Soil excavation shall be observed by a qualified archaeologist in accordance with a scheme of archaeological monitoring to identify any significant remains as they come to light;*
- vi. The foundations excavation will be raised to formation level by compacted layers of well graded granular material will be spread and compacted to provide a hard area for the met mast foundation.*

The met mast foundation will then be installed using the standard excavated reinforced concrete bases methodology as detailed above in Section 2.3.3.1.

2.3.3.5 Borrow Pit

It is intended to obtain materials for the construction of the Proposed Wind Farm from the proposed on-site borrow pit. Please see Figure 4-11 in Chapter 4 for details of the proposed borrow pit.

- i. It is proposed to construct the borrow pit so that the base of the borrow pit is below the level of the adjacent section of access track.*

- ii. *Slopes within the excavated granular material formed around the perimeter of the borrow pit will be formed at stable inclinations to suit local conditions, at an angle of 45 degrees.*
- iii. *The stability of the slopes within the borrow pit will be inspected by the Project Geotechnical Engineer upon excavation to ensure stability during construction works and in the long term. This inspection will allow unfavourable conditions to be identified and suitable mitigation measures to be applied.*
- iv. *It will be necessary to construct a buttress along the perimeter of the borrow pit to maximise the storage capacity. The buttress should be constructed of selected granular fill and placed and compacted in suitable layers to form a buttress of sufficient stability to retain the placed peat and spoil. The founding stratum for the buttress will be inspected and approved by the Project Geotechnical Engineer.*
- v. *The height of the buttresses constructed should be greater than the height of the reinstated peat and spoil to prevent any surface peat and spoil run-off. Buttresses up to 3m in height are likely to be required.*
- vi. *Infilling of the peat and spoil will commence at the back edge of the borrow pit and progress towards the borrow pit entrance/rock buttress, allowing the borrow pit to be developed and infilled in cells. The contractor excavating the rock will be required to develop the borrow pit in a way which will allow the excavated peat and spoil to be reinstated safely.*
- vii. *In order to prevent water retention occurring behind the buttress, the buttress will be constructed of coarse boulder fill with a high permeability. The buttress will be constructed of well graded granular rock fill of about 100mm up to typically 500mm in size.*
- viii. *The use of temporary access ramps and long reach excavators during the placement of the excavated peat and spoil will be required.*
- ix. *The surface of the placed peat and spoil will be shaped following backfill using excavators to allow efficient run-off of surface water from the placed arisings towards the perimeter of the borrow pit.*
- x. *As the berms are slightly higher than the retained peat and spoil, drains will be provided at regular intervals through the berms, at the same level as the top of the peat surface, to prevent ponding of water around the edges of the repositories. These drains will be 150mm diameter flexible plastic drainage pipe or equivalent.*
- xi. *A layer of geogrid to strengthen the surface of the placed peat and spoil within the borrow pit will be required.*
- xii. *An interceptor drain will also be installed upslope of the borrow pit. This drain will divert any surface water away from the borrow pit and hence prevent water from ponding and lodging during construction and also when reinstated.*
- xiii. *Temporary control of groundwater within the borrow pit will be required and exact measures will be determined as part of the confirmatory ground investigation programme. A temporary pump and suitable outfall locations will be required during construction.*
- xiv. *A settlement pond will be constructed at the lower side/outfall location of the borrow pit.*
- xv. *The acrotelm will be placed with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the peat and spoil within the borrow pit.*
- xvi. *Supervision by the Project Geotechnical Engineer will be carried out for the development of the borrow pit.*
- xvii. *All the above-mentioned requirements will be implemented by the Contractor during construction.*

Upon removal of the sand and gravel from the borrow pit, it is proposed to reinstate the borrow pit using excavated peat and spoil. The majority of the material backfilled into the borrow pit will be non-

peat spoil. The excavated granular material from the borrow pit will be used in the construction of the infrastructure elements (turbine bases, tracks, etc.) for the Proposed Project.

Two extraction methods have been assessed for breaking out the useful rock below: rock breaking and blasting.

2.3.3.5.1 **Rock Breaking**

Weathered or brittle rock can be extracted by means of a hydraulic excavator and a ripper attachment. This is a common extraction methodology where fragmented rock is encountered as it can be carefully excavated in layers. In areas where stronger rock is encountered and cannot be removed by means of excavating then a rock breaking methodology may be used. Rock breaking equipment comprises a large hydraulic 360-degree excavator with a rock breaker attachment. Given the power required to break out tight and compact stone at depth, the machines are generally large and in the 40-60 tonne size range. Even where rock might appear weathered or brittle at the surface, the extent of weathering can quickly diminish with depth resulting in strong rock requiring significant force to extract it at depths of only a few metres.

A large rock breaking excavator progressively breaks out the solid rock from the ground in the borrow pit area. A smaller rock breaker, in the 30-40 tonne size range, then breaks the rocks down to a size that can then be fed into a crusher.

The extracted, broken rock is loaded into a mobile crusher using a wheeled loading shovel and crushed down to the necessary size of graded stone required for the on-site civil works. The same wheeled loader takes the stone from the crusher conveyor stockpile and stockpiles it elsewhere within the borrow pit, away from the immediate area of the crusher, until it is required elsewhere within the Site.

2.3.3.5.2 **Rock Blasting**

Where blasting is used as an extraction method, a mobile drilling rig is used to drill vertical boreholes into the area of rock that is to be blasted. A drilling rig will drill the necessary number of boreholes required for a single blast in approximately 3 to 4 days. The locations, depth and number of boreholes are determined by the blast engineer. This is a specialist role fulfilled by the blasting contractor.

The blast engineer will arrange for the necessary quantity of explosive to be brought to site to undertake a single blast. The management of explosives on-site and the actual blasting operation will be agreed in advance with and supervised by An Gardaí Síochána. The blast engineer sets the explosives in place in the boreholes, sets the charges, and fires the blast.

A properly designed blast should generate rock of a size that can be loaded directly into a mobile crusher, using the same wheeled loader outlined above. The same method is used for processing the rock generated from a blast, as would be used to process rock generated by rock breaking. Generally, the drilling rig will recommence drilling blast holes for the next blast as soon one blast finished. The potential impacts and control measures associated with noise and vibration from this extraction method are assessed in Chapter 12: Noise and Vibration. Any blasting will be carried out in accordance with the *Guidance on the Safe Use of Explosives in Quarries* (Safety and Health Commission for the Mining and Other Extractive Industries, 2002)¹ and the British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*².

¹https://www.hsa.ie/eng/Publications_and_Forms/Publications/Mines_and_Quarries/Guidance%20on%20the%20Safe%20Use%20of%20Explosives%20in%20Quarries.pdf

²<https://www.thenbs.com/PublicationIndex/documents/details?Pub=BSI&DocID=305965>

2.3.3.6 Underground Electrical (33kV) and Communication Cabling

The transformer in each turbine and the met mast will be connected to the on-site substation through a network of underground electrical and communication cabling. The ground is trenched using a mechanical excavator. The top layer of soil (or track surface) is removed and saved so that it is replaced on completion. The cable ducting will be bedded with suitable material. The cabling will be laid at a depth of approximately 1.2m below ground level; a suitable marker tape is installed between the cabling and the surface (see Plate 4-11 below illustrating an example of a single 33kV cable trench and Plate 4-12 below illustrates an example of a trefoil 33kV cable trench). On completion, the ground will be reinstated. The route of the underground electrical and communication cabling will follow the access tracks as illustrated on the Proposed Wind Farm layout drawings included as Appendix 4-1 of the EIAR. The cabling may be placed on either side of the access track footprint, on both sides of the access tracks and/or within the road. The exact configuration of the underground cabling will be set by the requirements of the electrical designers at detailed design stage.



Plate 2-1 Typical Single Cable Trench View



Plate 2-2 Typical Trefoil Cable Trench View

2.3.4 Proposed Grid Connection

2.3.4.1 Onsite 110kV Electricity Substation and Control Buildings

A detailed drawing of the proposed onsite 110kV substation is shown in Appendix 4-1. Once constructed, electricity on the Cloon- Castlebar 110kV OHL will be transmitted through the proposed substation, hence the 'loop-in/loop-out' nature of the proposed 110kV substation. The proposed onsite 110kV substation will be constructed by the following methodology:

- i. This new substation will be in a compound of circa 125m x 100m plan area secured by a 2.6m high palisade fence.
- ii. The substation compound and drainage will be marked out by a qualified engineer.
- iii. A drainage system will be excavated and installed around the compound area.
- iv. Topsoil and subsoil will be removed from the footprint of the compound using an excavator. The excavated material will be temporarily stored in adjacent berms for later use during reinstatement works.
- v. A layer of geotextile material will be laid over the footprint of the compound.
- vi. Using an excavator, a base layer of Clause 804 material will be laid followed by a 6F2 capping layer which will provide the finished surface.
- vii. Each layer will be compacted using a vibrating roller.
- viii. Earthing cable will be laid underground around the substation for connection to the various electrical components during the electrical fit out phase.
- ix. The construction of an 12,206.8m² substation compound comprising of approx. 437.5m² single storey 110kV substation control building, a 216.4m² IPP building and associated outdoor electrical equipment, including 1 no. 110kV transformer, associated internal access track, 2.6m high station perimeter fencing and concrete post and rail property boundary fence will be built.
- x. Adequate lighting will be installed around the compound on the lighting masts.
- xi. Lightning protection masts of approximate height 18m will be installed to protect the station from direct lightning strikes.
- xii. The electrical installation is expected to take 20 weeks and includes the following:

- a. *Delivery and installation of 33/110kV transformer. These are unusually large and the deliveries will be managed in accordance with regulations governing the movement of large loads.*
- b. *Delivery and installation of all other HV equipment.*
- c. *Wiring and cabling of HV/LV equipment, protection and control cabinets.*
- d. *Commissioning of all newly installed equipment.*



Plate 2-3 Typical 110kV electrical infrastructure



Plate 2-4 Typical 110kV transformer connection

2.3.4.2 **Underground Electrical (110kV) and Communication Cabling**

The underground cabling works will consist of the installation of ducts in an excavated trench to accommodate electrical and fibre communications cables to facilitate a loop connection between the proposed 110kV on-site substation and the existing 110kV Cloon - Castlebar OHL.

The proposed UGC will consist of 2 No. trenches with a minimum of 2m separation distance between each circuit. Each trench will contain 3 No. 160mm diameter HDPE power cable ducts and 3 No. 125mm diameter HDPE communications duct to be installed in an excavated trench, typically 825mm wide by 1,315mm deep, with variations on this design to adapt to bridge crossings, service crossings and watercourse crossings, etc. The power cable ducts will accommodate 3 No. power cables. The communications duct will accommodate a fibre cable to allow communications between the Cunlaghfadda substation and the adjoining Cloon and Castlebar 110kV substations. The ducts will be installed, the trench reinstated in accordance with landowner/ Mayo County Council specification, and then the electrical cabling/fibre cable is pulled through the installed ducts. Construction methodologies to be implemented and materials to be used will ensure that the UGC is installed in accordance with the requirements and specifications of EirGrid and ESB.

The following outlines the methodology to be followed during trenching works:

- i. The Contractor, and their appointed Site Manager, will prepare a targeted Method Statement concisely outlining the construction methodology and incorporating all mitigation and control measures included within the planning application and accompanying reports and as required by planning conditions where relevant;
- ii. All existing underground services shall be identified on site prior to the commencement of construction works;
- iii. Where the cable route intersects with culverts, the culvert will remain in place (where possible) and the ducting will be installed either above or below the culvert to provide minimum separation distances in accordance with ESB and Irish Water specifications;
- iv. Excavated material will be temporarily stockpiled onsite for re-use during reinstatement. Stockpiles will be restricted to less than 2m in height. Stockpiles will be located a minimum of 50m from surface water features and all stockpiling locations will be subject to approval by the Site Manager and Project Ecological Clerk of Works (ECoW);
- v. Excavated material shall be employed to backfill the trench where appropriate and surplus material will be transferred to the spoil deposition area;
- vi. Any earthen (sod) banks to be excavated will be carefully opened with the surface sods being stored separately and maintained for use during reinstatement;
- vii. The excavated trench will be dewatered if required, from a sump installed within the low section of the opened trench. Where dewatering is required, dirty water will be fully and appropriately attenuated, through silt bags, before being appropriately discharged to vegetation or surface water drainage feature;
- viii. Where required, grass will be reinstated by either seeding or by replacing with grass turves;
- ix. No more than a 100m section of trench will be opened at any one time. The second 100m will only be excavated once the majority of reinstatement has been completed on the first;
- x. The excavation, installation and reinstatement process will take an average of 1 no. day to complete a 100m section;



Plate 2-5 Typical 110kV underground duct installation on private land

For the trenching and ducting works the following step by step methodology will apply:

- i. Grade, smooth and trim trench floor when the required 1315mm depth and 825mm width have been obtained.
- ii. Place bedding layer of Cement Bound Granular Mixture B (CBGM B) material in accordance with the specification and compact it so that the compacted thickness is as per the drawings.
- iii. Lay the bottom row of ducts in trefoil formation as detailed on the design drawings. Use spacers as appropriate to establish horizontal duct spacing. Fit a secure cap / bung to the end of each duct run to prevent the ingress of dirt or water.
- iv. Carefully surround and cover ducts with CBGM B in accordance with the design drawings and specifications and thoroughly compact without damaging ducts.
- v. Place cable protection strips on compacted CBGM B directly over the ducts.
- vi. Lay the top row of ducts onto the freshly compacted CBGM B including the cable protection strips above the bottom row of ducts. Place a secure cap at the end of each duct to prevent the ingress of dirt or water.
- vii. Carefully surround and cover ducts with CBGM B material in accordance with the drawing and thoroughly compact without damaging ducts.
- viii. Place red cable protection strip on top of compacted CBGM B over each set of ducts as shown on the drawings.
- ix. Place and thoroughly compact CBGM B material or Clause 804 backfill or soil backfill as specified and place warning tape at the depth shown on the drawings.
- x. For unsurfaced/grass sections, backfill with suitable excavated material to ground level leaving at least 100 mm topsoil or match existing level at the top to allow for seeding or replace turves as per the specification of the local authority or landowner.
- xi. Clean and test the ducts in accordance with the specification by pulling through a brush and mandrel. Install 12 mm polypropylene draw rope in each duct and seal all ducts using robust

duct end seals fitted with rope attachment eyes in preparation for cable installation later. All the works should be witnessed by ESNB Clerk of Works (CoW) as required.

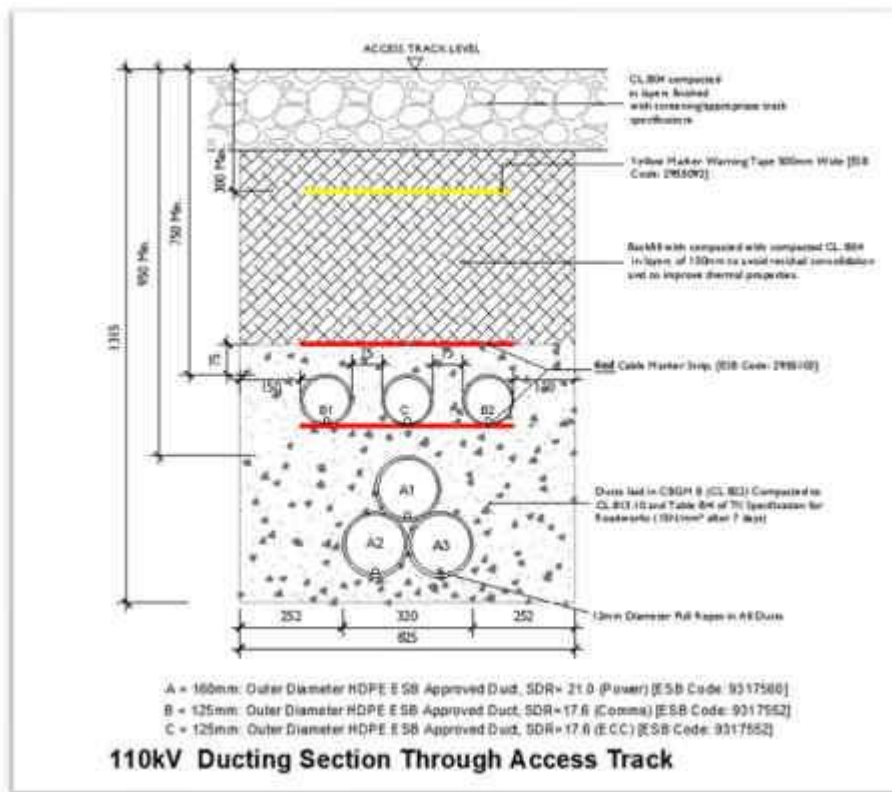


Plate 2-6 Typical single trench in access track

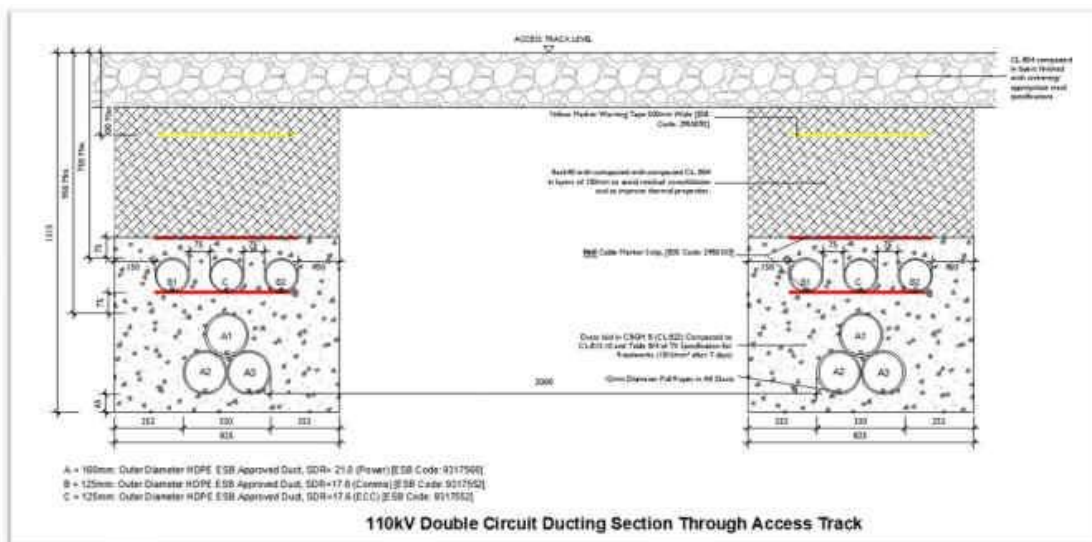


Plate 2-7 Double Circuit Ducting Section

It is proposed to connect the proposed on-site 110kV substation to the existing Cloon- Castlebar 110kV OHL. Two proposed end masts (lattice type towers) will be located immediately beneath the existing OHL. The existing OHL conductor will be terminated at these end masts to facilitate a new loop connection following the proposed c.982m underground grid connection route leading to the on-site 110kV substation. See Appendix 4-2 and Figure 4-12 of Chapter 4 for details.

The following section outlines the construction methodology for the new end mast structures which will be constructed underneath the existing Cloon- Castlebar 110kV OHL:

- i. End Mast sites are scanned for underground services such as cables, water pipes etc. Consultation with the landowners and utility service providers will help to identify hazards and ensure there are no unidentified services in the area.
- ii. For each leg of the 2 No. end masts (8 legs in total) a foundation circa. 4m x 4m x 3m deep is required. To allow for safe construction the excavation will be stepped back which requires additional area to be excavated or shutter piles used if ground material is not suitable for benching. The formation levels (depths) will be checked by the onsite engineer. The excavated material will be temporarily stored close to the excavation and excess material will be used as berms along the site access tracks.
- iii. To aid construction, a concrete pipe is placed into each excavation to allow operatives level the mast at the bottom of the excavation. The frame of the reinforcing bars will be prepared and strapped to a concrete pipe with spacers as required. The reinforcing bars will be lifted into each excavated foundation using the excavator and chains/slings. The base and body section of each mast will then be assembled next to the excavation.
- iv. Concrete trucks will pour concrete directly into each excavation in distinct stages.
- v. A final pour for the mast is the encasing of the mast leg which will be finished 300mm over finished ground level. The leg of the mast is required to be shuttered with metal panels to form the required shape.
- vi. Once the concrete is set after five days the shuttering is removed and if used sheet piles removed.

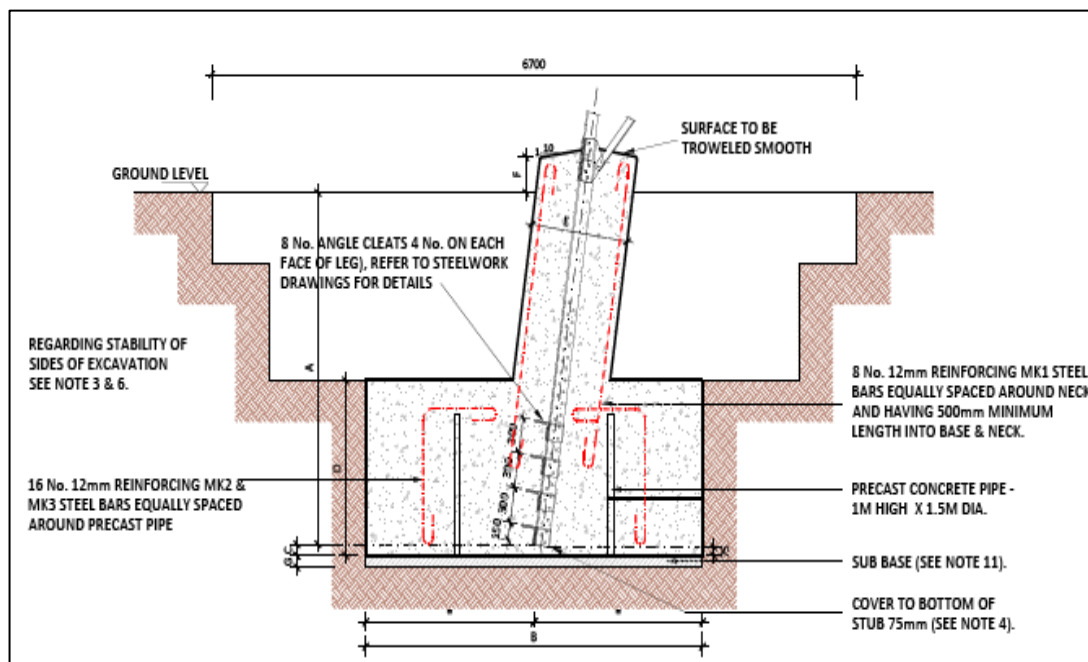


Plate 2-8 New End Mast Foundation



Plate 2-9 Typical 110kV end mast foundation excavation (example image)

- i. The end mast foundations will be backfilled one leg at a time with the material already excavated at the location. The backfill will be placed and compacted in layers. All dimensions will be checked following the backfilling process. All surplus excavated material will be removed from the mast locations and stored in berms for reuse across the construction site.



Plate 2-10 Base of end mast structure backfilled

- i. For the masts located under the existing line, the line will be de-energised by ESB so work can commence on the construction of the masts. Where it is offline the masts will be built without an outage.
- ii. An earth mat consisting of copper or aluminium wire will be laid circa 400mm below ground around the mast. This earth mat is a requirement for the electrical connection of the equipment on the mast structure.

- iii. Once the base section of each mast is completed and the concrete sufficiently cured, it is ready to receive the mast body.
- iv. A hardstand area for the crane will be created by laying geogrid material on the ground surface and overlaying this geogrid with a suitable grade of aggregate.
- v. A physical barrier (Heras Fence Site Boundary) will be put in place to restrict plant from coming too close to the OHL.
- vi. The mast will be constructed lying flat on the ground beside the recently installed mast base.
- vii. The conductor will be moved off centre using a stay wire and weights to anchor the stay wire to ground.
- viii. The mast section will be lifted into place using the crane and guide ropes.
- ix. The body sections will be bolted into position.
- x. The conductor will be centred over the masts and held in place. Once the conductor is secured at both ends it is then cut and attached onto each mast. The section of conductor in between the two masts will be removed and utilised as connector wire for the new masts.
- xi. Down dropper conductors (For Electrical Connections, Insulators, Surge arrestors), shackles and all associated accessories required for transition from line to cable will be installed on the interface masts.
- xii. The circuit will be tested in both directions before the line is re-energised.



Plate 2-11 End Mast under construction



Plate 2-12 Cable end mast

2.3.5 Proposed Project

The following sections outline the construction methodology for elements included as part of both the Proposed Wind Farm and the Proposed Grid Connection, with the construction methodologies being the same for both applications.

2.3.5.1.1 Existing Underground Services

Any underground services encountered along the Proposed Project will be surveyed for level and the ducting will pass over the service provided adequate cover is available. In order to facilitate the installation of an underground grid connection, it will be necessary to relocate existing underground services. In advance of any construction activity, the contractor will undertake additional surveys of the proposed route to confirm the presence or otherwise of any services. If found to be present, the relevant service provider will be consulted with in order to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works.

Water Mains

In advance of any construction activity, the contractor will undertake pre-commencement surveys to confirm the presence or otherwise of any services such as water supply. If found to be present, the relevant service provider will be consulted with in order to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works.

- Scoping consultation with Uisce Eireann identified a water mains that traverses through the North western section of the Site. If the Proposed Project receives a grant of permission, the Applicant commits to liaise with Uisce Eireann to redirect the pipe, with diversion being done before commencement of construction work to maintain water supply during construction, in accordance with Uisce Eireann.
- In the event that any additional water mains are encountered, the water supply will be turned off by the utility so work can commence on diverting the service. The section of existing pipe will be removed and will be replaced with a new pipe along the new alignment of the service. The works will be carried out in accordance with the specifications of the relevant utility provider.

Gas

There are no gas pipelines located within the Site however there are gas pipelines located nearby. A Gas Networks Ireland (GNI) high pressure underground gas pipeline travels in a north to south direction c.340m west of the Site. A medium pressure gas pipeline runs south from the Knockroe Above Ground Installation (AGI) which is located c.212m west of the Site for approx. 430m, and then runs adjacent to the southern section of the EIAR Site Boundary along the L1505. A cathodic protection gas pipeline runs from the Knockroe AGI in an east-west direction towards the EIAR Site Boundary and stops c. 41m near the proposed upgrade to public road (L15053).

The Applicant has been able to achieve a 400m setback from the closest turbines (T1) which exceeds the requirements requested by GNI, as outlined in Section 15.3.3.1 of Chapter 15. There are no turbines located within the designated setback distance of 184m. The proposed road upgrade works to the L15053, proposed temporary site entrance and temporary widening works are adjacent to the medium pressure gas pipeline which is located within the L1505. No crossing of any existing gas pipeline will be required during the construction phase of the Proposed Project.

Due to the nearby presence of gas pipelines, prior to construction the Applicant will engage with GNI via the 'Dial Before You Dig' procedure online. GNI will be contacted on 1800 42 77 47 **before** excavating near the identified gas pipelines.

Furthermore, the following guidance documents will be adhered to during all excavation works associated with the Proposed Project:

- GNI (2020) 'Safety advice for working in the vicinity of natural gas pipelines Guideline No: HSQE/GU/016 Rev 2'
- GNI (2021) 'Code of Practice for Working in the Vicinity of the Transmission Network'
- Health and Safety Authority (2016) 'Code of Practice for Avoiding Danger from Underground Services'
- United Kingdom Onshore Pipeline Operator's Association (UKOPA) (2017) 'UKOPA Good Practice Guide: Requirements for the Siting and Installation of Wind Turbines Installations in the Vicinity of Buried Pipelines (UKOPA/GP/013)'

Underground Cables

If existing low voltage underground cables are found to be present, a trench will be excavated, and new ducting and cabling will be installed along the new alignment and connected to the network on either end. The trench will be backfilled with suitable material to the required specification. Warning strip and marking tape will be laid at various depths over the cables as required. Marker posts and plates will be installed at surface level to identify the new alignment of the underground cable, the underground cables will then be re-energised. The works will be carried out in accordance with the utility standards.

2.3.5.2 Culvert Crossings

All new proposed culverts and proposed culvert upgrades at field drain crossings required for the Proposed Project will be suitably sized for the expected peak flows in the watercourse. 1 no. existing culvert crossings will require upgrading as part of the Proposed Project, this being along the upgrade of the L15053 public road section within the Site. 2 no. new culvert crossings will also be required for the Proposed Project, the first being at the operational site entrance and the second new culvert crossing being along the new access track north of T3. Furthermore, as part of the accommodation works required for the turbine delivery route, an extension of an existing culvert along a small stream on the junction between the L1505 and L1506 will be required.

Some culverts may be installed to manage drainage waters from works areas of the Proposed Project, particularly where the waters have to be taken from one side of an existing access track to the other for discharge. The size of culverts will be influenced by the depth of the track or road sub-base but will have a minimum 900mm diameter. In all cases, culverts will be oversized to allow mammals to pass through the culvert.

Culverts will be installed with a minimum internal gradient of 1% (1 in 100). Smaller culverts will have a smooth internal surface. Larger culverts may have corrugated surfaces which will trap silt and contribute to the stream ecosystem. Depending on the management of water on the downstream side of the culvert, large stone may be used to interrupt the flow of water. This will help dissipate its energy and help prevent problems of erosion. Smaller water crossings will simply consist of an appropriately sized pipe buried in the sub-base of the track at the necessary invert level to ensure ponding or pooling does not occur above or below the culvert and water can continue to flow as necessary.

All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance. Please see Figure 4-27 for details.

2.3.5.3 Site Tracks

To facilitate travel within the Site and to connect the various project components together, existing onsite tracks will need to be upgraded and new access tracks will need to be constructed. The Proposed Project makes use of the existing track network insofar as possible. The proposed site access tracks will be constructed using the methodology summarised below.

2.3.5.3.1 **Upgrading of Existing Access Tracks and Public Road (L15053)– Types A and B**

Approximately 1km of the existing access tracks and 772m of public road (L-15053) will require upgrading for the Proposed Project which will comprise widening of the roadway to a total running width of approximately five metres, with wider sections at corners and the passing bay and the laying of a new surface dressing on the existing section of roadway where necessary. The road upgrade methodology will be undertaken as follows:

- i. *Access track construction will be to the line and level requirements as per design/planning conditions.*
- ii. *For upgrading of all existing excavated access tracks the following guidelines apply:*

- a. *Excavation of the access track will take place to a competent stratum beneath the peat, removing all peat and soft clay and backfilled with suitable granular fill.*
- b. *Benching of the excavation will be required between the existing section of access track and the widened section of access track where the depth of excavation exceeds 500mm.*
- c. *For a founded access track, the surface of the existing access track will be overlaid with up to 300mm of selected granular fill.*
- d. *Access tracks will be finished with a layer of capping across the full width of the track.*
- e. *A layer of geogrid/geotextile may be required at the surface of the existing access track where the existing tracks shows signs of rutting, etc.*
- f. *For excavations in peat, side slopes will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat are encountered then slacker slopes will be required to ensure stability.*
- iii. *For upgrading of existing access tracks constructed using a floated construction technique the following guidelines apply:*
 - a. *The surface of the existing access track should be graded/tidied up prior to the placement any geogrid/geotextile, where necessary (to prevent damaging the geogrid/geotextile).*
 - b. *Where granular fill has been used in the existing access track make-up, a layer of geogrid should be placed on top of the existing access track.*
 - c. *The geogrid may be overlaid with up to 500mm of selected granular fill.*
 - d. *Additional geogrid and granular fill may be required in certain sections of the works, such as where excessive rutting is noted in the existing track (to be confirmed by the designer).*
- iv. *The finished track width will have a running width of approximately 5m, with wider sections on bends, corners and the passing bay.*
- v. *On side long sloping ground any track widening works required will be done on the upslope side of the existing access track, where possible.*
- vi. *At transitions between new floating and existing excavated tracks a length of about 10m shall have all peat excavated and replaced with suitable fill. The surface of this fill shall be graded to accommodate wind turbine construction and delivery traffic.*
- vii. *A final surface layer shall be placed over the existing access track, as per design requirements, to provide a track profile and graded to accommodate wind turbine construction and delivery traffic.*

2.3.5.3.2 New Site Tracks- Types C and D

Approximately 3.7km of new access tracks will be constructed which will comprise an access track with a final running width of approximately five metres, with wider sections at corners and the laying of appropriate surface dressing on the new access track where necessary. It is also proposed to construct 615m of temporary construction tracks and 0.37ha of temporary widening areas at the Site to facilitate the delivery of turbines and abnormal loads. All temporary construction tracks will be constructed as excavated track. Approximately 2.5km of proposed new tracks will be excavated track and approximately 0.7km of proposed new track will be floating track. Approximately 615m of temporary construction tracks will be constructed as new excavated tracks.

Construction of New Excavated Tracks through Peat – Type C

The construction methodology for the proposed new excavated tracks and turbine hardstands is outlined as follows:

- i. *Prior to commencing the construction of the excavated tracks, movement monitoring posts will be installed in areas where the peat depth is greater than 2.0m, and in areas identified within the peat stability risk assessment (see Appendix 8-1 Geotechnical & Peat Stability Assessment, FT, 2025) as requiring monitoring.*

- ii. *Interceptor drains will be installed upslope of the access track alignment to divert any surface water away from the construction area.*
- iii. *Excavation of tracks will be to the line and level given in the design requirements. Excavation will take place to a competent stratum beneath the peat.*
- iv. *Track construction will be carried out in sections of approximately 20m lengths i.e. no more than 20m of track will be excavated without replacement with stone fill. This length will be reduced to 5m in areas identified within the peat stability risk assessments.*
- v. *Excavation of materials with respect to control of peat stability:*
 - a. *Acrotelm (to about 0.3 to 0.4m of peat) will be required for landscaping and will be stripped and temporarily stockpiled for re-use as required. Acrotelm stripping will be undertaken prior to main excavations.*
 - b. *Where possible, the acrotelm will be placed with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation.*
 - c. *All catotelm peat (peat below about 0.3 to 0.4m depth) will be transported immediately on excavation to the designated peat and spoil management areas.*
- vi. *Once excavated, non-catotelm peat will be temporarily stored in localised areas adjacent to excavations for tracks and hardstands before being placed into the permanent peat and spoil management areas or within the borrow pit. All peat and spoil management areas will be upslope of founded tracks/hardstands and will be inspected by the Project Geotechnical Engineer before material is stored in the area. No material is to be sidecast or stored on the in-situ peat on the downslope side of the access tracks.*
- vii. *Excavation side slopes in peat will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate. Should areas of weaker peat be encountered then slacker slopes will be required. Battering of the side slopes of the excavations will be carried out as the excavation progresses.*
- viii. *End-tipping of stone onto the track during the construction/upgrading of the access track will be carefully monitored to ensure that excessive impact loading, which may adversely affect the adjacent peat, is limited.*
- ix. *The excavated access track will be constructed with a minimum of 500mm of selected granular fill. Granular fill to be placed and compacted in layers in accordance with the TII Specification for Road Works.*
- x. *Access tracks will be finished with a layer of capping across the full width of the track.*
- xi. *A layer of geogrid/geotextile may be required at the surface of the competent stratum.*
- xii. *Where slopes of greater than 5 degrees are encountered along with relatively deep peat (i.e. greater than 2m) 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, where possible. This method avoids any unnecessary loading to the adjacent peat and greatly reduces any risk of peat instability.*
- xiii. *Where the above is not possible, a specific Risk Assessment Method Statement (RAMS) from the contractor will be produced, detailing how the downslope works will be undertaken, including that all plant would operate from the already constructed section of track, with no loading of the peat on the downslope slope and limiting the length of ground to be stripped/excavated at any one time. Movement monitoring posts (as described in Appendix 4-3 Peat & Spoil Management Plan, Section 9.1) will also be installed downslope of the works area to allow for ongoing monitoring during the construction works.*
- xiv. *A final surface layer will be placed over the excavated track and graded to accommodate wind turbine construction and delivery traffic.*
- xv. *The construction and upgrading of access tracks in areas of deep peat (greater than 2m) will be inspected on a routine basis (by the Site Manager/Ecological Clerk of Works/Project Geotechnical Engineer) during the works, particularly before/following trafficking by heavy vehicular loads and following intense rainfall events.*

Construction of New Floating Access Tracks over Peat – Type D

The construction methodology for the sections of new floating access tracks is outlined below. This methodology includes procedures that will be included in the construction to minimise any adverse impact on peat stability.

It should be noted that details of geogrid arrangement will be provided by the specialist geogrid provider/designer.

- i. *Prior to commencing floating track construction movement monitoring posts will be installed in areas where the peat depth is greater than 2m.*
- ii. *Base geogrid will be laid directly onto the existing peat surface along the line of the track in accordance with geogrid provider's requirements.*
- iii. *Construction of the track will be in accordance with appropriate design from the designer.*
- iv. *The make-up of the new floated access track is up to 1,000mm of selected granular fill with 2 no. layers of geogrid with possibly the inclusion of a geotextile separator.*
- v. *Granular fill will be placed and compacted in layers in accordance with the TII Specification for Road Works.*
- vi. *Following the detailed design of the floated access tracks it may be deemed necessary to include pressure berms either side of the access track in some of the deeper peat areas. The inclusion of a 2 to 5m wide pressure berm (typically 0.5m in height) either side of the access track will reduce the likelihood of potential bearing failures beneath the access track.*
- vii. *The finished track width will be 5m, with wider sections on bends and corners.*
- viii. *Stone delivered to the floating track construction will be end-tipped onto the constructed floating track. Direct tipping of stone onto the peat will not be carried out.*
- ix. *To avoid excessive impact loading on the peat due to concentrated end-tipping all stone delivered to the floating track will be tipped over at least a 10m length of constructed floating track.*
- x. *Where it is not possible to end-tip over a 10m length of constructed floating track then dumpers delivering stone to the floating track will carry a reduced stone load (not greater than half full) until such time as end-tipping can be carried out over a 10m length of constructed floating track.*
- xi. *Following end-tipping a suitable bulldozer will be employed to spread and place the tipped stone over the base geogrid along the line of the track.*
- xii. *A final surface layer will be placed over the full width of the floating track, as per design requirements, to provide a track profile and graded to accommodate wind turbine construction and delivery traffic.*

2.3.5.4 Temporary Construction Compound

There are two proposed construction compounds; one in the southwest of the Site and forms part of the Section 34 application (Proposed Wind Farm) and one adjacent to the proposed 110kV substation which will be subject to a Section 182A application (Proposed Grid Connection). Both compounds will be constructed in the same manner as follows:

- i. *The area to be used as the compound will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter;*
- ii. *The compound platform will be established using a similar technique as the construction of the substation platform as discussed below in section 4.9.2.1;*
- iii. *A layer of geo-grid will be installed where deemed necessary by the designer and compacted layers of well graded granular material will be spread and lightly compacted to provide a hard area for Site offices and storage containers;*
- iv. *A limited amount of fuel will have to be stored in appropriately bundled containers and a designated area for oil storage will be constructed within the compound.*

- v. Areas within the compound will be constructed as access tracks and used as vehicle hardstandings during deliveries and for parking;
- vi. A bunded containment area will be provided within the compound for the storage of lubricants, oils and site generators etc;
- vii. A waste storage area will be provided within the compound;
- viii. The compound will be fenced and secured with locked gates if necessary; and,
- ix. Upon completion of the Proposed Project, the temporary construction compounds will be decommissioned and allowed to vegetate naturally.

2.3.5.5 Peat and Spoil Management Areas

The following recommendations and best practice guidelines for the placement of peat and spoil in the identified peat and spoil management areas, alongside the site access tracks, and as landscaping around turbines will be adhered to during the construction of the Proposed Project:

- i. Excavated peat/spoil will be placed/spread on the upslope side of sections of access tracks. These locations are shown in Figure 4-28. Excavated spoil will only be placed in areas where there is no/limited peat (<0.3m), such as around the substation and close to T04, T06 and T07.
- ii. The peat placed within the areas shown in Figure 4-29 will be restricted to a maximum height of 1.25m.
- iii. The spoil placed in the areas shown in Figure 4-30 will be restricted to a maximum height of 1.5m.
- iv. The placement of excavated peat will be avoided without first establishing the adequacy of the ground to support the load. The placement of peat and spoil within the peat and spoil management areas will require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works.
- v. Where there is any doubt as to the stability of the peat surface then no material will be placed on to the peat surface. The risk of peat instability is reduced by not placing any loading onto the peat surface.
- vi. It should be ensured that the surface of the placed peat is shaped to allow efficient run-off of surface water. Shaping of the surface of the peat will be carried out as placement of peat within the peat and spoil management progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability in the placed peat.
- vii. Finished/shaped side slopes in the placed peat will be not greater than 1 (v): 4 (h). This slope inclination will be reviewed during construction, as appropriate.
- viii. The acrotelm will be placed on the finished surface with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the placed peat within the peat and spoil management areas.
- ix. Movement monitoring instrumentation will be placed around the areas where peat has been placed. The locations where monitoring is required will be identified by the Project Geotechnical Engineer on Site.
- x. Supervision by the Project Geotechnical Engineer is required for the works.
- xi. An interceptor drain will be installed upslope of the designated peat and spoil management areas to divert any surface water away from these areas. This will help ensure stability of the placed peat and reduce the likelihood of debris run-off.
- xii. All the above-mentioned commitments will be undertaken by the Contractor during construction.

2.3.5.6 Biodiversity Enhancement and Management

A Biodiversity Management and Enhancement Plan (BMEP) has been prepared for the Proposed Project and is included as Appendix 6-4 to the EIAR.

High value habitats were identified during initial habitat surveys of the Site and transition mire and quaking bog and *Molinia* meadow. The Proposed Project has been designed to avoid these areas and

where they are located adjacent to proposed works areas, fencing will be implemented with appropriate signage prohibiting entrance to the areas.

2.3.5.6.1 **Proposed Enhancement Measures**

Planting and Bolstering of Treeline and Hedgerow

The field boundaries within the Site are largely delineated by mature (managed and unmanaged) hedgerow and treeline habitats. It is anticipated approximately 1.256 of linear habitat will be permanently removed to accommodate the Proposed Project, including turbines and associated bat buffers, wind farm roads and other key infrastructure.

It is proposed to plant approximately 2,500m of new and bolstered hedgerow and treeline habitat within the Site. The hedgerow planting areas are depicted on Figure 3-2 of Appendix 6-4 and have been strategically chosen to link up existing areas of bat activity. The hedgerows will be replanted within suitable areas and in consultation with the landowners who are supportive of the hedgerow planting proposals.

Species selected will be indigenous to the local area. The ideal native hedge is made up of approx. 75% hawthorn and 25% of at least four other species (NBDC, 2022). When planting new hedgerows, plants will be closely spaced (a maximum of 50cm apart) and planted in a staggered row. The new hedgerow will need to be protected from poaching by livestock, through the erection of new stockproof fencing where required, which should be at least 1m away from the hedge, and on each side if required.

In the north of the Site, bolstering of an existing treeline is proposed to the west of the area of Annex I *Molinia* meadow. In order to avoid tracking or excessive trampling through the *Molinia* meadow habitat, tree planting activities will be undertaken in this area will be accessed and conducted from the western side of the treeline, through the improved wet grassland in that area, wherever possible. If required to be accessed from the east, no vehicles or machinery will be permitted to drive through the area of *Molinia* meadow, with works and transport being undertaken on foot, and with the appointed ecologist present.

Hedgerow Management and Monitoring

Management measures for hedgerow post replanting include:

- Hedgerows are to be trimmed on a 3 to 5-year rotation to maximise structural diversity and to prevent over-trimming,
- Hedgerows are to reach approx. 2.5m height with an 'A' shape,
- Hedgerows cutting is to be carried out between November and January. This will avoid the bird nesting season (March 1st to August 31st) and will avoid impacts on foraging pollinators,
- It is expected that ivy will self-colonise, and this will be retained where possible,
- Grassy margins will be retained to preserve flowering ground flora and pollinator foraging habitat,
- The use of fertilisers, slurry, herbicides and pesticides will be avoided, in line with NBDC guidance on the management of wind farms for pollinators (NBDC, 2022).

Newly planted hedgerows and planted trees will be inspected following the main growing season (i.e. in September) for the first five years of growth, where the requirement for replacement planting will be assessed. If any trees are dead or damaged these will be replaced using the same species within the next planting season.

Planting of Native Woodland

It is proposed to plant 3.5ha of native trees within the Site as shown on Figure 3-2 of Appendix 6-4 of the EIAR. Over time these areas will establish into native woodland and scrub. Planting and establishment of woodland within the woodland planting areas will follow the recommendations and specifications of the native woodland scheme.

Areas of proposed planting over peaty soils will be composed of downy birch (*Betula pubescens*), Scot's pine (*Pinus sylvestris*), pedunculate oak (*Quercus robur*) and rowan (*Sorbus aucuparia*). Minor species (i.e. less frequent species) will be comprised of grey willow (*Salix cinerea*) and eared willow (*Salix aurita*) where wetter conditions occur locally within the planting areas. It is not proposed to undertake any drainage to facilitate the planting of the woodlands within the Site, with the species chosen tailored to the prevailing conditions on the Site.

Areas of proposed planting over well drained mineral soils will be composed of pedunculate oak (40%), with downy birch (20%), hazel (*Corylus avellana*) (20%) and hawthorn (5%) scattered throughout. Wild cherry (*Prunus avium*) (5%) will be planted in groups of 5 to 10 trees. Minor species (10%) are to comprise at least three of the following, positioned alongside planned woodland edges and glades: holly (*Ilex aquifolium*), spindle (*Euonymus europaeus*), rowan, crab apple (*Malus sylvestris*) and alder (*Alnus glutinosa*).

Trees will be of native origin and will be of advanced nursery stock where possible to allow for a varied age structure within the area of woodland to be created. The areas for planting have been strategically chosen to link up with identified bat commuting corridors within the Site and will provide enhanced habitat foraging area relative to the existing habitats within the Site.

Native Woodland Management and Monitoring

In order to facilitate the successful establishment of the new trees to be planted within the Site, the following measures are proposed:

- New tree planting will be kept weed and litter free until the new plants are established, particularly from ruderal weeds. Healthy growth will be maintained by allowing the plant to occupy as much of the planting areas as possible to allow them to achieve as close their natural form as possible.
- During spring and autumn maintenance periods all trees and plants will be checked and adjusted/replaced as required, soil firmed, and any dead wood present removed back to healthy tissue and mulch added if required. Where tree guards are no longer required these will be removed to avoid damage to the tree.
- During the first growing season, all standard trees/ semi-mature trees will be watered regularly during any prolonged dry periods during the growing season (i.e. in April, May, June, July and August). During the second growing season the trees will be kept well-watered as often as required, particularly during June, July and August.

Newly planted native woodland will be monitored following the main growing season (i.e. in September) for the first five years of growth, where the requirement for replacement planting will be assessed. If any trees are dead or damaged these will be replaced using the same species within the next planting season.

Enhancement of *Molinia* Meadow Habitats

The Proposed Project has been designed such that existing areas of *Molinia* meadow and breeding marsh fritillary habitat have been avoided and retained. It is further proposed to enhance the existing area of degraded *Molinia* meadow habitat to the southeast of Turbine 6, comprising 1.16ha. This area is illustrated in Figure 3-2 of Appendix 6-4 of the EIAR. It is proposed to manage this area to encourage greater floral species diversity and assist it to revert back to higher quality *Molinia* meadow habitat.

These enhancement measures will also serve to create an additional area of suitable breeding habitat, in *Good Condition* as per NBDC guidelines, for marsh fritillary butterfly¹. This area lies within 300 metres of the area of confirmed breeding habitat for marsh fritillary and will therefore create additional ‘stepping stone’ habitat which is key for the survival of the meta populations of the species and to increase its distribution across the landscape.

It is proposed to implement a suitable management regime in the *Molinia* meadows/marsh fritillary enhancement areas via grazing. The aim will be to create an uneven patchwork of short and long vegetation by the end of the grazing period. The habitat enhancement measures will commence at the start of the operational stage to reduce disturbance to livestock from construction and to avoid any potential access issues. On a broader scale, the aim is to create a connected network of grasslands suitable for marsh fritillary within the Site.

Molinia Meadow Management and Monitoring

It is proposed to implement a suitable management regime in the *Molinia* meadows/marsh fritillary enhancement areas via grazing. The aim will be to create an uneven patchwork of short and long vegetation by the end of the grazing period.

The following management measures are proposed:

- Sheep grazing is unsuitable for habitat enhancement as they avoid grazing of *Molinia* and will graze selectively for flowers. Grazing by traditional breeds³ of cattle or horses, or donkeys are more commonly used for habitat enhancement purposes, as they are less selective grazers than sheep. The vegetation structure created by the grazing of cattle is the most suitable to the enhancement of habitat for marsh fritillary butterfly, as their grazing behaviour leaves both tufts of ungrazed vegetation and short grazed areas (Byrne and Moran, 2018; Initiative for Nature, Conservation Cymru, 2021; Martin *et al.*, 2023; Northern Ireland Environment Agency, 2020; Phelan *et al.*, 2021).
- A low stocking level of 0.2-0.4LU/ha is recommended⁴. However, the stocking rate is to be subject to monitoring and altered as required. The goal is to have a structured sward between 12 and 25cm in height.
- An additional area within the same field within the site comprising 2.03ha of wet grassland habitat to the south of the habitat enhancement area will also be available for grazing to avoid issues with overstocking the area for habitat enhancement.
- Supplementary feeding (if required), and water trough placement is to be provided only on the additional area of wet grassland to the south of the habitat enhancement area to prevent excessive poaching and nutrient enhancement within the area of *Molinia* meadow to be enhanced.
- Due to the wet nature of the Site, and the small area available for conservation grazing, grazing should be limited to spring and summer. This can be revised if necessary following the monitoring of the management measure proposed.
- Mowing will be avoided in this area, unless recommended following monitoring of the proposed management regime. Mowing can be utilised as a once-off option for rehabilitation of overgrown areas but is not a viable long-term management option as it removes variations in sward height required to create a suitable habitat structure for marsh fritillary butterfly (Phelan *et al.*, 2021).

³ Ireland has nine native traditional breeds recognised by the Department of Agriculture, Food and the Marine (DAFM): the Connemara pony, Kerry bog pony, Irish Draught horse, Galway sheep, Old Irish Goat, and the cattle breeds Kerry, Dexter, Droimeann and Irish Moiled cattle.

⁴ Irish Native Rare Breed Society: Conservation Grazing Stocking Rates and Timing. Accessed at: <https://inrbs.ie/conservation-grazing-stocking-rates-and-timing/>

- No fertiliser, slurry or pesticide usage will be permitted in the habitat enhancement area. Herbicide use will be avoided, unless required as part of invasive species management.
- No reseedling with perennial rye grass will be permitted in the habitat enhancement area.
- Field operations such as rush or scrub control should only be carried out November to February when caterpillars are in hibernation and less subject to disturbance, and outside of bird nesting season.

A site-specific monitoring and evaluation programme will be implemented to ensure that the success of the proposed measures remains long-term. The proposed management actions will be conveyed to each of the landowners and management alterations implemented as required to achieve the targets of the management plan. Measures may include:

- Alterations to stocking densities, and/or timing of grazing.
- Removal of scrub in areas of excessive scrub encroachment.
- Propagation of devil's bit scabious plant through seed collection or green hay strewing from areas where the plant is present on the Site to establish more plants throughout the Site if required. Seed collection will be undertaken outside of areas with marsh fritillary larval webs present.

Monitoring surveys will also include presence/absence surveys for marsh fritillary. Further detail on the monitoring proposals can be found in Appendix 6-4 of the EIAR.

2.3.5.7 Tree Felling and Scrub Removal

Tree felling will be required within and around the Proposed Project infrastructure footprint to allow for the construction of the turbine bases, access tracks, underground cabling, and the other ancillary infrastructure. Further details on tree felling required within and around the development footprint is detailed in Chapter 6 of this EIAR.

Approximately 0.7 hectares of conifer plantation (WD4) will be felled to accommodate Proposed Project infrastructure. Of this, 0.6 ha relates to the Proposed Wind Farm infrastructure, and 0.1 ha relates to the Proposed Grid Connection infrastructure.

Approximately 2.5ha of scrub and mosaics of scrub will be permanently lost to facilitate the Proposed Project. Approximately 1,256 linear metres of hedgerows and treeline will also be permanently removed to facilitate the construction of access tracks and ancillary infrastructure, and to achieve the required bat foraging buffers from the proposed turbines.

Figure 4-26 in Chapter 4 shows the extent of the commercial forestry, native woodland, as well as scrub loss and linear habitat loss to be permanently felled/removed as part of the Proposed Project.

The 0.7ha of commercial forestry felling required as part of the Proposed Project will be the subject of a Limited Felling Licence (LFL) application to the Forest Service in accordance with the Forestry Act 2014 and the Forestry Regulations 2017 (SI 191/2017) and as per the Forest Service's policy on granting felling licenses for wind farm developments. The policy requires that a copy of the planning permission for the Proposed Project be submitted with the felling licence application; therefore, the felling licence cannot be applied for until such time as planning permission is obtained for the Proposed Project.

2.3.5.7.1 Forestry Replanting

In line with the Forest Service's published policy on granting felling licences for wind farm developments, areas cleared of forestry for access tracks, and any other wind farm-related uses will have to be replaced by replanting at an alternative site or sites. The Forest Service policy requires

replacement or replanting on a hectare for hectare basis for the felling carried out as part of the Proposed Project.

The identified 0.7ha of commercial forestry that will be permanently felled for the Proposed Project will be replaced or replanted on a hectare for hectare basis as a condition of any felling licence that will be issued in respect of the Proposed Project. Replanting is a requirement of the Forestry Act and is primarily a matter for the statutory licensing processes that are under the control of the Forest service. The replacement of the felled forestry as part of the Proposed Project may occur on any lands, within the State benefitting from Forest Service Technical Approval⁵ for afforestation, should the Proposed Project receive planning permission. Under the Forestry Regulations 2017, all applications for licences for afforestation require the prior written approval (technical approval) of the Minister for Agriculture, Food and the Marine. Before the Minister can grant approval, he/she must first determine if the project is likely to have significant effects on the environment (for EIA purposes) and shall assess if the development, individually or in combination with other plans or projects is likely to have a significant effect on a European site (for Habitats purposes).

The Applicant commits to replanting the 0.7ha of conifer plantation, outside the hydrological catchments within which the Site is located. On this basis, it is reasonable to conclude that there will be no cumulative effects associated with the replanting of 0.7ha of conifer plantation. Therefore, the forestry replanting is not considered further in the impact assessment chapters of this EIAR. In addition, the Applicant commits to not commencing the Proposed Project until both a felling and afforestation licence(s) is in place and, therefore, this ensures the afforested lands are identified, assessed and licenced appropriately by the relevant consenting authority.

As identified in Section 4.4.1.8 below, approximately 2.5km of linear habitat will be replanted as part of the Proposed Project. The 3.6ha loss of scrub habitat will be offset by the proposed native woodland replanting identified in Section 4.4.1.8 below; please see Appendix 6-2 Bat Survey Report and Appendix 6-4 BMEP for further information.

3. ENVIRONMENTAL MANAGEMENT

3.1 Introduction

This CEMP includes all best practice measures required to construct the Proposed Project. The drainage proposals will be developed further prior to the commencement of construction however, any such improvements will be in line with the principles set out here and will also be in full compliance with the planning consent and mitigation measures as presented in the EIAR, Natura Impact Statement (NIS) and all other relevant planning documents. The following sections give an overview of the drainage design principles, dust and noise control measures and a waste management plan for the Site.

3.2 Protecting Water Quality

3.2.1 Good Environmental Management During Construction

Timing of works can strongly influence the potential for damaging the freshwater environment. Operations during wetter periods of the year pose a significantly greater risk of causing erosion and

⁵ All proposed forestry developments where the area involved is greater than 0.1 hectare must receive the prior written approval of the Forest Service. The application for approval is known as Pre-Planting Approval – Form 1.

siltation, which can be particularly severe following major rainfall or snowmelt events. Traditionally, wind farm construction undertaken during the drier summer months would result in significantly less erosion and siltation. Construction activities in the hydrological buffer zones shall be avoided during or after prolonged rainfall or an intense rainfall event and work will cease entirely near watercourses when it is evident that water quality is being impacted.

3.2.2 Site Drainage Principles

The site drainage features have been outlined in Chapter 4, Section 4.6 of the EIAR in addition to the drainage design and management for the Proposed Project. The protection of the watercourses within and surrounding the Site, and downstream catchments that they feed is of utmost importance in considering the most appropriate drainage proposals for the Site. Two distinct methods will be employed to manage drainage water within the Site. The first method involves 'keeping clean water clean' by avoiding disturbance to existing drainage features, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations, construction areas and temporary storage areas. The second method involves collecting any drainage waters from works areas within the Site that might carry silt or sediment, and nutrients, to route them towards new proposed silt traps and settlement ponds (or stilling ponds) prior to controlled diffuse release into the existing drainage network. There will be no discharge of untreated or unattenuated water to the existing hydrological features (forestry and agricultural drains or natural watercourses).

A detailed drainage design for the Proposed Project will be prepared prior to the commencement of construction to be by the Project Hydrologist to incorporate these site drainage principles and carry forward into the construction phase of the Proposed Project.

3.2.3 Legislation and Best Practice Guidance

The drainage design presented in the EIAR and planning application documents has been prepared based on experience of the project team of other renewable energy sites in similar environments, and the number of best practice guidance documents.

There is no one guidance document that deals with drainage management and water quality controls for wind farm and other renewable energy developments. However, a selection of good practice approaches have been adopted in preparation of this CEMP, and these are taken from the various best practice guidance documents listed below. These relate to infrastructure and operational works on sites, road design, water quality controls for linear projects, road drainage and management of geotechnical risks. To achieve best practice in terms of water protection through construction management, the detailed drainage design and all drainage management proposals shall be prepared in accordance with guidance contained in the following:

- Forestry Commission (2011): Forests and Water UK Forestry Standard Guidelines, Fifth Edition. Publ. Forestry Commission, Edinburgh;
- Circular Letter PL 1/2017: Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive);
- Environmental Protection Agency (2022): Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- Institute of Geologists Ireland (2013) Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements;
- DoE/NIEA (2015): Wind farms and groundwater impacts - A guide to EIA and Planning considerations”;
- OPW (2009) The Planning System and Flood Risk Management;
- National Roads Authority (2008) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;

- Wind Energy Development Guidelines for Planning Authorities, 2006 (the Guidelines (DoEHLG, 2006)) and the Draft Revised Wind Energy Development Guidelines (the Draft Guidelines (DoEHLG, 2019));
- Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Watercourses;
- Good Practice During Wind Farm Construction (Scottish Natural Heritage, 2010);
- CIRIA (Construction Industry Research and Information Association) Guidance on 'Control of Water Pollution from Linear Construction Projects' (CIRIA Report No. C648, 2006);
- Wind Farms and Groundwater Impacts: A guide to EIA and Planning considerations (DoE/NIEA, April 2015);
- Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London, 2001;
- Land Types for Afforestation (Forest Service, 2016b);
- Forest Protection Guidelines (Forest Service, 2002);
- Forest Operations and Water Protection Guidelines (Coillte, 2013);
- Forestry and Water Quality Guidelines (Forest Service, 2000b); and,
- Forests and Water, Achieving Objectives under Ireland's River Basin Management Plan 2018-2021 (DAFM, 2018).
- Institute of Environmental Management & Assessment (IEMA) (2022) A New Perspective on Land and Soil in Environmental Impact Assessment

3.2.4 Site Drainage Design and Management

The proposed site drainage features for this Site are outlined in Section 4.7 of the EIAR. As this CEMP is a working document and is presented as an Appendix to the EIAR, the drainage measures are not included in this document. When the final CEMP report is prepared, and presented as a standalone document, all drainage measures will be included in that document. These drainage proposals will be developed further prior to the commencement of construction as part of the detailed drainage design. The following sections give an outline of drainage management arrangements in terms of pre-construction, construction, operational and decommissioning phases of the Proposed Project.

3.2.4.1 Pre-Construction Drainage

Prior to commencement of works in sub-catchments across the Site, main drain inspections will be competed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on a catchment-by-catchment basis as the construction works develop across the Site, as works in all areas will not commence simultaneously.

Drainage and associated pollution control measures will be implemented onsite before the main construction works commence. Where possible drainage controls will be installed during seasonally dry ground conditions. This will reduce the possibility of impact on surface waters by suspended sediment released during construction and entrained in surface run-off. Avoidance of sensitive hydrological features where possible, by application of suitable buffer zones. There is 1 no. EPA mapped watercourse within the Site- this being the Meander River. A 50m buffer has been applied to this watercourse as is considered best practise. It should be noted that the closest turbine to this watercourse is T5 which exceeds this buffer and is located c.372m southwest at its closest point. Drumady Lough and Lough Nambrackkeagh are also located in close proximity to the Site and a self-imposed buffer zone of 100m has been put in place for these lakes (Note that some works are proposed within the delineated 100m lake buffer zone and additional mitigation measures are prescribed in Chapter 9, Section 9.5.2.3 for these works).

The routes of any natural drainage features will not be altered as part of the Proposed Project. Turbine locations have been selected to avoid natural watercourses. There will be no direct discharges to natural watercourses. All discharges from the proposed works areas or from interceptor drains will be made

over vegetated ground at an appropriate distance from watercourses. Buffer zones around the existing natural drainage features have informed the layout of the Proposed Project and are indicated on the drainage design drawings.

3.2.4.2 Construction Phase Drainage

The key principles of drainage design that will be implemented and adhered to as part of the Proposed Project are as follows:

- Keep clean water clean by intercepting it where possible, upgradient of works areas, and divert it around the works areas for discharge as diffuse overland flow or for rewetting of land.
- Collect potentially silt-laden runoff from works areas via downgradient collector drains and manage via series of avoidance, source, in-line, treatment and outfall controls prior to controlled diffuse release as overland flow or for rewetting of land.
- No direct hydraulic connectivity from construction areas to watercourses or drains connecting to watercourses.
- Where possible, maintain 50-metre watercourse (rivers and streams) buffer applied to the wind turbines.
- Where possible, maintain 100-metre lake buffer applied to the wind turbines.
- No alteration of natural watercourses.
- Maintain the existing hydrology of the Site.
- Blocking of existing manmade drainage as appropriate.
- Daily inspection and recording of surface water management system by on-site Environmental Clerk of Works and immediate remedial measures to be carried out as required and works temporarily ceased if a retained stormwater/sediment load is identified to have the potential to migrate from the Site.
- Use of siltbuster or equivalent system if required.

Runoff control and drainage management are key elements in terms of mitigation against impacts on surface water bodies. Two distinct methods will be employed to manage drainage water within the Site. The first method involves 'keeping clean water clean' by avoiding disturbance to existing drainage features, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations, construction areas and temporary storage areas. The second method involves collecting any drainage waters from works areas within the Site that might carry silt or sediment, and nutrients, to route them towards new proposed silt traps and settlement ponds (or stilling ponds) prior to controlled diffuse release into the existing drainage network. There will be no discharge of untreated or unattenuated water to the existing hydrological features (forestry and agricultural drains or natural watercourses).

The Proposed Drainage Design is included as Appendix 4-4 of the EIAR.

The Project Hydrologist will complete a detailed drainage design and maintenance plan before construction commences and will attend the Site to set out and assist with micro-siting of proposed drainage controls as outlined in Section 4.6 of the EIAR. The drainage system will be excavated and constructed in conjunction with the road and hard standing construction. Drains will be excavated, and settlement ponds constructed to eliminate any suspended solids within surface water running off the Site.

Drainage infrastructure within the Proposed Project will include:

- Source controls:
 - Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sand bags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems.

- Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas.
- In-Line controls:
 - Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems.
- Treatment systems:
 - Temporary sumps and ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems.

It should be noted that within the Site, an extensive network of forestry, peat and agricultural drains already exist, and these will be integrated and enhanced as required and used within the Proposed Wind Farm drainage system. The integration of the existing forestry drainage network and the Proposed Wind Farm network is relatively simple. The key elements being the upgrading and improvements to existing water treatment elements, such as in line controls and treatment systems, including silt traps, settlement ponds and buffered outfalls.

The main elements of interaction with existing drains will be as follows:

- Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Site drainage into the existing site drainage network. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion;
- Silt traps will be placed in the existing drains upstream of any streams where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area;
- Runoff from individual turbine hardstanding areas will be not discharged into the existing drain network but discharged locally at each turbine location through settlement ponds and buffered outfalls onto vegetated surfaces;
- Buffered outfalls which will be numerous over the Site will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the Site; and,
- Drains running parallel to the existing roads requiring widening will be upgraded, widening will be targeted to the opposite side of the road. Velocity and silt control measures such as check dams, sand bags, oyster bags, flow limiters, weirs, baffles, silt fences will be used during the upgrade construction works. Regular buffered outfalls will also be added to these drains to protect downstream surface waters.

There are no proposed watercourse crossings proposed as part of the Proposed Project, with the closest proposed infrastructure being located c. 375m away from the closest watercourse. Setbacks from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures to be properly installed and operate effectively. The proposed buffer zone will:

- Avoid physical damage to watercourses, and associated release of sediment;
- Avoid excavations within close proximity to surface watercourses;
- Avoid the entry of suspended sediment from earthworks into watercourses; and,
- Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone;

All of the Proposed Project works will be supervised by the Environmental Clerk of Works (ECoW) supported by the Project Hydrologist.

Best practice and practical experience on other similar projects suggests that in addition to the drainage plans that are included in the EIAR, there are additional site-based decisions and plans that can only be made in the field through interaction between the Site Construction Manager, the Project Hydrologist and the Project Geotechnical Engineers. Further details on Roles and Responsibilities are outlined within Section 4.1 of this CEMP.

In relation to decisions that are made on site it is important to stress that these will be implemented in line with the associated drainage controls and mitigation measures outlined in Section 7 of this CEMP, and to ensure protection of all watercourses.

The Project Hydrologist/Design Engineer will complete a site drainage and maintenance plan before construction commences and will attend the Site to set out and assist with micro-siting of proposed drainage controls as outlined in Chapter 4, Section 4.6 of the EIAR. The drainage system will be excavated and constructed in conjunction with the road and hard standing construction. Drains will be excavated, and stilling ponds constructed to eliminate any suspended solids within surface water running off the Site.

3.2.4.3 Operational Phase Drainage

The Project Hydrologist will inspect and review the drainage system after construction has been completed to provide guidance on the requirements of an operational phase drainage system. This operational phase drainage system will have been installed during the construction phase in conjunction with the road and hardstanding construction work as described in Section 2.3.3.2 and Section 2.3.3.4 above and in Section 4.6 of the EIAR.

The drainage system will be monitored in the operational phase until such a time that all areas that have been reinstated become re-vegetated and the natural drainage regime has been restored.

The drainage system will not be altered upon decommissioning. Measures which will be implemented to ensure no impacts upon the drainage system during decommissioning will be outlined within the Decommissioning Plan (Appendix 4-6 to the EIAR) and fully agreed with the local authority prior to any decommissioning works.

3.2.4.4 Preparative Site Drainage Management

The detailed drainage design will specify all materials and equipment necessary to implement the drainage measures effectively, which will be brought on site in advance of any works commencing.

An adequate quantity of straw bales, clean stone, terram, stakes, etc. will be kept on site at all times to implement the detailed drainage design measures as necessary. The detailed drainage measures will be installed prior to, or at the same time as the works they are intended to drain.

3.2.4.5 Pre-emptive Site Drainage Management

The works programme for the groundworks part of the construction phase of the Proposed Project will also take account of weather forecasts and predicted rainfall. Large excavations, large movements of overburden or large-scale overburden or soil stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.

3.2.4.6 Reactive Site Drainage Management

In line with the requirements of the EIAR, the final drainage design prepared for the Proposed Project prior to commencement of construction will provide for reactive management of drainage measures. The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously by the ECoW or supervising hydrologist on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. This may require the installation of additional check dams, interceptor drains or swales as deemed necessary on-site. The drainage design may have to be modified on the ground as necessary, and the modifications will draw on the various features outlined above in whatever combinations are deemed to be most appropriate to situation on the ground as a particular time.

In the event that works are giving rise to siltation of watercourses, the ECoW or supervising hydrologist will stop all works in the immediate area around where the siltation is evident. The source of the siltation will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing.

3.2.4.7 Cable Trench Drainage

Cable trenches are typically constructed in short, controlled sections, thereby minimising the amount of ground disturbed at any one time and minimising the potential for drainage runoff to pick up silt or suspended solids. Each short section of trench is excavated, ducting installed and bedded, and backfilled with the appropriate materials, before work on the next section commences.

To efficiently control drainage runoff from cable trench works areas, excavated material is stored on the up-gradient side of the trench and is temporarily sealed/smoothed over, using the back of the excavator bucket. Should any rainfall cause runoff from the excavated material, the material is therefore collected and contained in the downgradient cable trench. Excess subsoil is removed from the cable trench works area immediately upon excavation, and in the case of the Proposed Project, would be transported to one of the on-site designated spoil management areas or used for landscaping and reinstatement of other areas elsewhere on-site. Along sections of the Proposed Grid Connection underground cabling route that are further removed from the Site it may be more practical to transport excess excavated material to a nearby licenced facility.

On steeper slopes, silt fences, as detailed in Section 4.7.4.12 of the EIAR will be installed temporarily downgradient of the cable trench works area, or on the downhill slope below where excavated material is being temporarily stored to control run-off.

3.2.4.8 Rainfall Forecasting and Monitoring

Accurate forecasting and monitoring of rainfall is critical to the successful pre-emptive and reactive site drainage management as outlined in the subsections above.

Rainfall forecasts will be obtained for the nearest forecast reference point available via the [www.yr.no](https://www.yr.no/en/forecast/daily-table/5-397000/Ireland/Claremorris) weather forecasting website: <https://www.yr.no/en/forecast/daily-table/5-397000/Ireland/Claremorris>.

The reference location will be that of Claremorris, Co. Mayo.

Construction personnel will be required to check the forecasted rainfall for the days ahead and plan for or suspend planned works accordingly. The forecasted rainfall should be recorded for reference and comparison with the rainfall levels to be recorded on-site.

Actual rainfall will be monitored on site, ideally via an automated rain gauge with regular recording intervals recommended by the Project Hydrologist and a means of alerting the construction personnel of rainfall trigger levels. Any recorded rainfall data should be available on site at all times for review by the ECoW, Project Hydrologist or any regulatory authorities. The appointed contractor will be required to outline their proposed means of recording rainfall on site to the satisfaction of the ECoW and the Project Hydrologist prior to commencement of works.

3.2.5 Refuelling, Fuel and Hazardous Materials Storage

Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles. On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. Heavy plant and machinery will be refuelled on-site by a fuel truck that will come to the Site as required on a scheduled and organised basis. Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area in the construction compound when not in use.

All refuelling will be carried out outside designated watercourse buffer zones. Only designated trained and competent operatives will be authorised to refuel plant on-site. Mobile measures such as drip trays and fuel absorbent mats will be used during refuelling operations as required. All plant and machinery will be equipped with fuel absorbent material and pads to deal with any event of accidental spillage.

The following mitigation measures are proposed to avoid release of hydrocarbons at the Site:

- Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles.
- All plant will be inspected and certified to ensure that they are leak free and in good working order prior to use at the Site.
- On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site.
- Heavy plant and machinery will be refuelled on-site by a fuel truck, with spill kits kept onboard, that will come to the Site as required on a scheduled and organised basis.
- Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area in the construction compound when not in use.
- Only designated trained operatives will be authorised to refuel plant on-site;
- Refuelling or maintenance of machinery will not occur within the delineated hydrological buffer zones;
- Fuels stored on the Site will be minimised;
- Any diesel or fuel oils stored at the temporary construction compound will be banded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; and,
- An emergency plan for the construction phase to deal with accidental spillages will be contained within Section 6.1.4 below. Spill kits will be available to deal with accidental spillages

3.2.6 Cement Based Products Control Measures

Concrete and other cement-based products are highly alkaline and corrosive and can have significant negative impacts on water quality. They generate very fine, highly alkaline silt (pH 11.5) that can physically damage fish by burning their skin and blocking their gills.

The following mitigation measures are proposed to avoid release of cement leachate from the Site:

- No batching of wet-concrete products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place;

- Where possible pre-cast elements for culverts and concrete works will be used;
- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined concrete washout ponds;
- Weather forecasting will be used to plan dry days for pouring concrete; and,
- The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event; and,
- At proposed turbine foundations, sand blinding, DPM, and lean-mix blinding are used to vertically contain the concrete. While the concrete is contained laterally by temporary/permanent shuttering. The concrete cures within 72hrs.

The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area, or a Siltbuster-type concrete wash unit or equivalent. This type of Siltbuster unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids will be removed off-site by an appropriately authorised waste collector for disposal at an authorised waste facility. Where temporary lined impermeable containment areas are used, such containment areas are typically built using straw bales and lined with an impermeable membrane. Two examples are shown below in Plate 3-1.



Plate 3-2 Typical concrete wash out areas

3.2.7 Tree Felling Drainage Measures

As discussed in Section 2.3.3.11 above, tree felling will be required within and around Proposed Project footprint to allow for the construction of the proposed turbines, access tracks, underground cabling, and the other ancillary infrastructure. The felling will not be undertaken simultaneously with construction groundworks. Keyhole felling to facilitate construction works will take place prior to groundworks commencing. A Harvest Management Plan is included as Appendix 4-4.

During tree felling there is a potential to generate silts and sediments in surface water runoff due to tracking of machinery and disturbance of the ground surface etc, however mitigation is provided in Chapter 9 Water with regard surface water quality protection for this activity which is summarised below. Also, prior to the commencement of tree felling for subsequent road construction the following key temporary drainage measures will be installed:

- All existing land and forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps;
- Clean water interceptor drains will be installed upgradient of the works areas;
- Check dams/silt fence arrangements (silt traps) will be placed in all existing that have surface water flows; and,

- A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.

Before the commencement of any felling works, an Environmental Clerk of Works (ECoW) shall be appointed to oversee the keyhole and extraction works. The ECoW shall be experienced and competent, and shall have the following functions and operate their record using a Schedule of Works Operation Record (SOWOR), as proposed in the planning application:

- Attend the Site for the setup period when drainage protection works are being installed and be present onsite during the remainder of the forestry keyhole felling works.
- Prior to the commencement of works, review and agreement of the positioning by the Operator of the required Aquatic Buffer Zones (ABZs), silt traps, silt fencing (see below), water crossings and onsite storage facilities for fuel, oil and chemicals (see further below).
- Be responsible for preparing and delivering the Environmental Tool Box Talk (TBT) to all relevant parties involved in site operations, prior to the commencement of the works.
- Conduct daily and weekly inspections of all water protection measures and visually assess their integrity and effectiveness in accordance with Section 3.4 (Monitoring and Recording) and Appendix 3 (Site Monitoring Form (Visual Inspections)) of the Forestry & Freshwater Pearl Mussel Requirements.
- Take representative photographs showing the progress of operation onsite, and the integrity and effectiveness of the water protection measures.
- Collect water samples for analysis by a 3rd party accredited laboratory, adhering to the following requirements:
- Surface water samples shall be collected upstream and downstream of the keyhole felling at suitable sampling locations.
- Sampling shall be taken from the stream / riverbank, with no in-stream access permitted.
- The following minimum analytical suite shall be used: pH, EC, TSS, BOD, Total P, Ortho-P, Total N, and Ammonia.
- Review of operator's records for plant inspections, evidence of contamination and leaks, and drainage checks made after extreme weather conditions.
- Prepare and maintain a contingency plan.
- Suspend work where potential risk to water from siltation and pollution is identified, or where operational methods and mitigation measures are not specified or agreed.
- Prepare and maintain a Water Protection Measure Register. This document is to be updated weekly by the ECoW.

To protect watercourses, the following measures will be adhered to during all keyhole/tree felling activities.

- All relevant measures, best practice methods and requirements set out in Chapter 9 of the EIAR will be adhered to including Forestry & Water Quality Guidelines, Forest Harvesting & the Environment Guidelines and the Forest Protection Guidelines.
- Machine combinations (i.e. handheld or mechanical) will be chosen which are most suitable for ground conditions and which will minimise soils disturbance;
- All machinery will be operated by suitably qualified personnel;
- Checking and maintenance of roads and culverts will be on-going through any felling operation. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during felling works;
- Machines will traverse the Site along specified off-road routes (referred to as racks);
- The location of racks will be chosen to avoid wet and potentially sensitive areas;
- Brash mats will be 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 can occur. Brash mat renewal should take place when they become heavily used and worn. Provision should be made for brash mats along all off-

- road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall;
- Silt fences will be installed at the outfalls of existing drains downstream of felling areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any felling works and will provide surface water settlement for runoff from work areas and will prevent sediment from entering downstream watercourses. Accumulated sediment will be carefully disposed of at pre-selected spoil repository areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground;
 - In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed onsite during construction;
 - Double silt fencing will also be put down slope of felling areas which are located in close proximity to streams and/or relevant watercourses;
 - Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded;
 - Timber will be stacked in dry areas, and outside watercourse buffer zones. Check dams and silt traps will be emplaced on the down gradient side of timber storage/processing sites;
 - Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff;
 - All refuelling will be completed outside of the designated 50m hydrological buffer zones. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and,
 - Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors.

Table 3-1 Minimum Buffer Zone Widths (Forest Service, 2000)

Average slope leading to the aquatic zone		Buffer zone width on either side of the aquatic zone	Buffer zone width for highly erodible soils
Moderate	(0 – 15%)	10 m	15 m
Steep	(15 – 30%)	15 m	20 m
Very steep	(>30%)	20 m	25 m

3.3

Archaeological Management

This section of the CEMP provides an outline of the mitigation measures outlined in Chapter 14 Archaeological, Architectural and Cultural Heritage of the EIAR for the construction phase of the Proposed Project.

There are no UNESCO World Heritage Sites or National Monuments located within or along the proposed footprint of the Proposed Project.

There are no recorded archaeological sites, or groups of sites, within the Proposed Project footprint or the Turbine Delivery Route accommodation areas. There are 94 no. archaeological sites, or groups of sites, within the 5km study area of the Proposed Wind Farm. None are located within the 50m study areas of the Proposed Grid Connection or the Turbine Delivery Route accommodation areas.

One National Monument is located within 10km of the Proposed Wind Farm, comprising a round tower (AH95). There are three sites that possess Preservation Orders within the 10km study area of the Proposed Wind Farm. These consist of a round tower, previously noted above (AH95, PO No. 77/1939) in Balla townland, c. 6.5km northwest of T7, which is also a National Monument (NM No. 403); a crannog (AH96, PO No. 10/1987) in Derry townland, c. 9.1km east-northeast of T4; and a rath (AH97, PO No. 6/1957) in Gallgort townland, c. 9.2km west-southwest of T1.

A total of 20 structures are listed in the National Inventory of Architectural Heritage (NIAH) within the 5km study area of the Proposed Wind Farm. None are located within the 50m study areas of the Proposed Grid Connection or Turbine Delivery Route accommodation areas. The closest consists of Cappagh House, located c. 1.7km to the south of T5.

Prior to the commencement of construction, a programme of archaeological test trenching will be carried out at greenfield locations of the Site, including the location of the proposed turbine hardstands, proposed temporary construction compounds, proposed borrow pit, along the proposed access tracks and along the underground cabling route. This work will be carried out under licence to the National Monuments Service of the DoHLGH. Dependent on the results of the testing assessment, further mitigation may be required, such as preservation by record or in-situ and/or archaeological monitoring. Any further mitigation will require agreement from the DoHLGH.

Where archaeological test trenching is not possible, such as areas dominated by forestry and bog, archaeological monitoring of topsoil stripping will be carried out. This work will be carried out under licence to the National Monuments Service of the DoHLGH. If archaeological remains are identified during the course of these works further mitigation may be required, such as preservation by record or in-situ. Any further mitigation will require agreement from the DoHLGH.

An upstanding drystone wall is located within the footprint of proposed Turbine Delivery Route accommodation works, and will be removed during construction of the proposed project. The remains will be subject to a detailed photographic and written record prior to the construction of the proposed project, carried out by a suitably qualified archaeologist. Following the delivery of the turbine components the wall will be reinstated.

Where direct effects have been identified to townland boundaries as part of the construction of the Proposed Project, works will be subject to archaeological monitoring, to include a full record of the sections of townland boundaries that are removed. This work will be carried out under licence to the National Monuments Service of the DoHPLG.

3.4

Traffic Management

This section of the CEMP provides an outline of the traffic management proposals for the construction phase of the Proposed Project. In the event planning permission is granted, the final Traffic Management Plan will address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned.

3.4.1 Turbine and Materials Transport Route

3.4.1.1 Proposed Wind Farm

The Port of Galway has been selected and assessed to facilitate turbine delivery to the Site. Vehicles delivering large turbine components and other abnormal loads to the Site will depart from Galway Port and travel northwest through Galway City along the R339 and R336 Regional Roads before reaching the N6 National Road at the Bothar na dTreabh/Tuam Road junction. The delivery vehicles will continue west along the N6/M6 Motorway before merging onto the M17 at the M6/M17/M18 intersection through the Rathmorrisy Interchange. From here, the delivery vehicles will continue north on the M17 and N17 Tuam bypass. The delivery vehicles will continue on the N17, travelling through Claremorris town on the L1519 before turning east onto the L1506. The delivery vehicles will travel on the L1506 for approximately 2.5 km before turning north onto the L1505, followed by taking a turn on to the L15053 towards the proposed Site entrance. The proposed route is shown in Chapter 4, Figure 4-33.

3.4.1.2 Proposed Grid Connection

The Proposed Grid Connection consists of underground 110kV electrical cabling from the proposed onsite 110kV substation, in the townland of Cloonbaul, Co. Mayo to connect into the existing Cloon-Castlebar 110kV Overhead Line (OHL) which runs from the northwest to the southeast adjacent to the site in the townland of Cloonbaul, Co. Mayo. The Proposed Grid Connection will facilitate the connection of the Proposed Wind Farm to the national electricity grid. The OHL will be broken with 2 no. new end masts (lattice-type towers) to facilitate the connection to the proposed onsite substation via the underground electricity cabling. The Proposed Grid Connection is located entirely within private land.

The footprint of the proposed onsite 110kV substation compound measures approximately 12,206.8m² in area and will include 2 no. control buildings and the electrical substation components necessary to consolidate the electrical energy generated by each wind turbine, and export that electricity from the proposed onsite 110kV substation to the national grid.

The proposed onsite 110kV substation compound will include steel palisade fencing (approximately 2.6 metre high or as otherwise required by ESB), and internal fences will also segregate different areas within the main substation.

The Proposed Grid Connection infrastructure is illustrated in Figure 2-2. The construction methodology for the Proposed Grid Connection is outlined in Section 2.3.4 above.

Before works commence, updated surveying will take place along the proposed cabling route, with all existing culverts and services identified, as detailed in Section 4.8.2.4 of the EIAR. All relevant bodies i.e., ESB, Mayo County Council, GNI etc. will be contacted and all up to date information for all existing services sought. Structural bridge surveys will be carried out, and the current proposals will be subject to detailed design prior to construction.

3.4.2 Traffic Mitigation Measures During the Construction Stage

The successful completion of the Proposed Project will require significant coordination and planning and a comprehensive set of mitigation measures will be put in place before and during the construction stage of the Proposed Project in order to minimise the effects of the additional traffic generated by the Proposed Project. The range of measures will include the following which are also set out in Chapter 15 of the EIAR.

A detailed Traffic Management Plan (TMP), incorporating all the mitigation measures set out within this CEMP along with Chapter 15 of the EIAR, will be finalised and detailed provisions in respect of traffic management agreed with the roads authority and An Garda Síochána prior to construction works commencing on Site. The detailed TMP will include the following:

- **Traffic Management Coordinator** – A competent Traffic Management Co-ordinator will be appointed for the duration of the development, and this person will be the main point of contact for all matters relating to traffic management.
- **Delivery Programme** – A programme of deliveries will be submitted to Mayo County Council in advance of deliveries of turbine components to the Site. Liaison with the relevant local authorities, TII and MMaRC (Motorway Maintenance and Renewals Contracts) will be carried out where required regarding requirements such as delivery timetabling. The programme will ensure that deliveries are scheduled in order to minimise the demand on the local network and minimise the pressure on the access to the Site.
- **Information to locals** – Locals in the area will be informed of any upcoming traffic related matters e.g. temporary lane/road closures (where required) or delivery of turbine components at night, via letter drops and posters in public places. Information will include the contact details of the Project Co-ordinator, who will be the main point of contact for all queries from the public or local authority during normal working hours. An "out of hours" emergency number will also be provided.
- **A Pre and Post Construction Condition Survey** – Where required by the local authority, a pre-condition survey of roads associated with the Proposed Project can be carried out immediately prior to construction commencement to record an accurate condition of the road at the time. A post construction survey will be carried out after works are completed to ensure that any remediation works are carried out to a satisfactory standard. Where required the timing of these surveys will be agreed with the local authority. All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.
- **Liaison with the relevant local authority** - Liaison with Mayo and Galway County Council and An Garda Síochána, will be carried out during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required. Once the surveys have been carried out and "prior to commencement" status of the relevant roads established, (in compliance with the provisions of the CEMP), the Roads section will be informed of the relevant names and contact numbers for the Project Developer/Contractor Site Manager as well as the Site Environmental Manager.
- **Implementation of temporary alterations to road network at critical junctions** – at locations highlighted in Section 15.1.9. In addition, in order to minimise the impact on the existing environment during turbine component deliveries the option of blade adaptor trailers will be used. .
- **Identification of delivery routes** – These routes will be agreed with Mayo County Council and adhered to by all contractors.
- **Delivery times of large turbine components** - The TMP will include the option to deliver the large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage.

- **Travel plan for construction workers** – While the assessment above has assumed the worst case in that construction workers will drive to the Site, the construction company will be required to provide a travel plan for construction staff, which will include the identification of routes to / from the Site and identification of an area for parking.
- **Additional measures** - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including wheel washing facilities on site and sweeping / cleaning of local roads as required. These are set out in the CEMP which is contained in Appendix 4-5.
- **Re-instatement works** - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.

3.5 Dust Control

Construction dust can be generated from many on-site activities such as excavation and backfilling. The extent of dust generation will depend on the type of activity undertaken, the location, the nature of the dust, i.e., soil, sand, peat, etc. and the weather. In addition, dust dispersion is influenced by external factors such as wind speed and direction and/or, periods of dry weather. Construction traffic movements also have the potential to generate dust as they travel along the haul route.

In periods of extended dry weather, dust suppression may be necessary within the Site, along haul roads and along the public road corridor, proposed new roads in private agricultural land, and proposed upgrades to existing private track associated with the Proposed Grid Connection underground cabling route to ensure dust does not cause a nuisance. If necessary, water will be taken from stilling ponds in the Site's drainage system and will be pumped into a bowser or water spreader to dampen down the relevant areas to prevent the generation of dust. Silty or oily water will not be used for dust suppression, as this would generate polluted runoff or more dust. Water bowser movements will be carefully monitored, as the application of too much water may lead to increased runoff.

Proposed measures to control dust include:

- Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored by the Ecological Clerk of Works (ECoW) to avoid, insofar as reasonably possible, increased runoff.
- All plant and materials vehicles shall be stored in dedicated areas within the Site.
- Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas.
- Turbines and construction traffic will be transported to the Site on specified haul routes only.
- The agreed haul route road adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary.
- The roads adjacent to the Site proposed new entrance will be checked weekly for damage/potholes and repaired as necessary.
- The transportation of materials from the borrow pit around the Site will be covered by tarpaulin or similar covered vehicles where necessary.
- The transportation of construction materials from locally sourced quarries to the Site will be covered by tarpaulin where necessary.
- If necessary, excavated material will be dampened prior to transport to the spoil management areas.
- Approximately 5 dust monitoring gauges will be deployed across the Site to detect any exceedances of acceptable dust levels.

- Waste material will be transferred to a licensed/permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal.
- The MRF facility will be local to the Proposed Project to reduce the amount of emissions associated with vehicle movement.
- The ECoW will regularly monitor adjacent marsh fritillary larval web areas on a daily basis for potential signs of dust deposition or any other habitat degradation. Dust level thresholds and weather will also be monitored in line with all proposed mitigation as set out in above.
- If any signs of habitat degradation are noted, the dust-producing works will be immediately halted and further mitigation to protect larval web areas from dust will be implemented in advance of resuming work.
- The ECoW will have power to halt construction works if required as outlined above.

When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper. The site roads will be well finished with compacted hardcore, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt. A road sweeper will be available if any section of the public road requires cleaning due to construction traffic associated with the Proposed Project.

3.6 Noise Control

The operation of plant and machinery, including construction vehicles, is a source of potential impact that will require mitigation at all locations within the Site.

The following proposed measures to control noise will be implemented in full include:

- Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- Establishing channels of communication between the contractor/developer, Local Authority and residents;
- Appointing a site representative responsible for matters relating to noise and vibration; and
- Monitoring typical levels of noise and vibration during critical periods and at sensitive locations.

Section 8 of BS5228-1:2009+A1:2014 as outlined in Chapter 12 (Noise & Vibration) of the EIAR, further recommends a number of simple control measures as summarised below that will be employed onsite:

- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract.
- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.
- Any plant, such as generators or pumps, which is required to operate outside of general construction hours will be surrounded by an acoustic enclosure or portable screen as appropriate.
- During the course of the construction programme, supervision of the works ensuring compliance with the limits detailed in Table 12-1 of Chapter 12 using methods outlined in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise.
- The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs and 19:00hrs Monday to Saturday. However, to ensure that optimal use is made of good

weather periods or at critical periods within the programme (i.e. concrete pours, turbine component deliveries) it could occasionally be necessary to work out of these hours.

An assessment of the construction phase noise levels has been undertaken in accordance with best practice guidelines and procedures as outlined in Section 12.6.2 of the EIAR. Please see Section 12.6.2.1.1 of the EIAR for further details.

3.7

Invasive Species Management

A baseline invasive species survey was carried out at the Site to identify the presence and location of any invasive species (listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) by a suitably qualified ecologist. As outlined in Chapter 6 of the EIAR, Japanese knotweed was recorded in the southernmost section of the Site, with multiple occurrences identified within the proposed construction footprint of the Proposed Project and the rest of the identified Japanese knotweed located within the adjacent cut over bog and wet grassland. Stands of Japanese knotweed ranged throughout the site from well-established large stands to medium sized patches and newly emerging young shoots.

Large, well established stands were identified primarily within the cut over bog habitat to the east and west of the local road (L15053) located in the south of the Site. Medium stands of Japanese knotweed occurred scattered throughout the wet grassland and cut over bog habitat. Newly emerging shoots and small regenerating patches were recorded more widely across the survey area, particularly around the margins of larger infestations and along the L15053 road.

A number of small stands and emerging shoots occur along both sides of the L15053, which is proposed for upgrade as part of the development, as shown in Figure 3-1 of Appendix 6-5 Invasive Species Management Plan. While these occurrences are not large, their location places them directly within the proposed construction footprint within the required 7 metre biosecurity buffer zone. The larger stands located further into the wet grassland and cutover bog habitats lie outside of the area of works and also outside of the 7 metre buffer zone and will not be directly affected by the Proposed Project. Given the presence of Japanese knotweed within the construction footprint and buffer zone, mitigations and strict biosecurity measures will be required to prevent accidental spread during works.

The measures that are set out in the Invasive Species Management Plan (ISMP) will ensure that the proposed works will not result in the spread or dispersion of Japanese knotweed or any other species listed on the 'First Schedule' of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374 of 2024) and 'Third Schedule' of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011). The Invasive Species Excavations within 7 m of Japanese knotweed will be supervised by a qualified ecologist and carried out in dry conditions to prevent spread. Works will progress from the outer edge of the exclusion zone inward, with continuous checks for rhizomes. Material confirmed as knotweed-free may be reused or removed from site, while contaminated material will be stockpiled within the exclusion zone for further treatment. All machinery and personnel working in contaminated areas will be thoroughly cleaned before leaving to prevent spreading rhizomes, and all works will follow established biosecurity measures. It should be noted that the ISMP is a live document and is subject to review following the undertaking of detailed pre-commencement surveys prior to the commencement of the construction phase of the project. No works will be undertaken without having first undertaken detailed pre-commencement surveys for invasive species listed on the schedules outlined above.

3.7.1

Site Management

Careful preparation and planning of the works is crucial to successful treatment of invasive species. The following list of guidelines, which is not exhaustive, shall be followed by all on-site personnel. Only those who have been inducted into biosecurity measures on-site may enter the contaminated zones within the works areas. Should any risk of contaminated material escaping be observed by the site

supervisor, the management plan for the Site must be amended by an appropriately qualified person to mitigate against the risk.

3.7.2 Establish Good Site Hygiene

The following measures are proposed to establish good site hygiene to ensure the control of any potential spread of invasive species during construction works:

- A risk assessment and method statement will be provided by the Contractor prior to commencing works.
- Fences will be erected around areas of infestation, as confirmed by test pits, and warning signs shall be erected.
- A designated wash-down area will be created, where power-washed material from machinery can be contained, collected and disposed of with other contaminated material. This area will contain a washable membrane or hard surface.
- Stockpile areas will be chosen to minimise movement of contaminated soil.
- Stockpiles will be marked and isolated.
- Contaminated areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery. Root barrier membranes will be protected by a layer of sand above and below and topped with a layer of hardcore.
- The use of vehicles with caterpillar tracks within contaminated areas will be avoided to minimise the risk of spreading contaminated material.
- An ECoW/suitably qualified ecologist will be on site to monitor and oversee the implementation of invasive species management plans.

Plant and equipment which is operated within an area for the management of materials in contaminated areas will be decontaminated prior to relocating to a different works area. The decontamination procedures will take account of the following:

- Personnel may only clean down if they are familiar with the plant and rhizome material and can readily identify it.
- Decontamination will only occur within designated wash-down areas.
- Vehicles will be cleaned using stiff-haired brush and pressure washers, paying special attention to any areas that might retain rhizomes e.g. wheel treads and arches.
- All run-off will be isolated and treated as contaminated material. This will be disposed of in already contaminated areas.

3.8 Waste Management

This section of the CEMP provides a waste management plan (WMP) which outlines the best practice procedures during the excavation and construction phases of the project. The WMP will outline the methods of waste prevention and minimisation by recycling, recovery, and reuse at each stage of construction of the Proposed Project. Disposal of waste will be seen as a last resort.

3.8.1 Legislation

The Waste Management Act 1996 and its subsequent amendments provide for measures to improve performance in relation to waste management, recycling and recovery. The Act also provides a regulatory framework for meeting higher environmental standards set out by other national and EU legislation.

The Act requires that any waste related activity has to have all necessary licenses and authorisations. It will be the duty of the Waste Manager on the Site to ensure that all contractors hired to remove waste from the Site have valid Waste Collection Permits. It will then be necessary to ensure that the waste is

delivered to a licensed or permitted waste facility. The hired waste contractors and subsequent receiving facilities must adhere to the conditions set out in their respective permits and authorisations.

The Department of the Environment provides a document entitled, *'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects'* (2021). It is important to emphasise that no demolition will take place at this Site, however, this document was referred to throughout the process of completing this WMP. The European Commission *'EU Construction & Demolition Waste Management Protocol'* (2024) has also been consulted in the preparation of this CEMP.

3.8.2 Waste Management Hierarchy

The waste management hierarchy sets out the most efficient way of managing in the following order:

Prevention and Minimisation

The primary aim of the WMP will be to prevent and thereby reduce the amount of waste generated at each stage of the project.

Reuse of Waste

Reusing as much of the waste generated on site as possible will reduce the quantities of waste that will have to be transported off site to recovery facilities or landfill.

Recycling of Waste

There are a number of established markets available for the beneficial use of Construction waste such as using waste concrete as fill for new roads.

At all times during the implementation of the WMP, disposal of waste to landfill will be considered only as a last resort.

3.8.3 Construction Phase Waste Management

3.8.3.1 Description of the Works

The turbines and meteorological mast will be manufactured off-site and delivered to the Site where on site erection will occur.

The turbine and meteorological mast foundations will consist of stone from the onsite borrow pit and licensed quarries and a concrete base which will contain reinforcing steel. These concrete foundations will be shuttered with steel formwork specifically designed for the works and re-usable off site on similar projects.

The new site access tracks and existing tracks/roads for upgrade will be constructed with rock sourced from the onsite borrow pit and local quarries. The onsite electrical substation and control buildings will be constructed on a concrete foundation with the buildings constructed with concrete masonry blocks with a timber roof structure and roof tile or slate covering. The roof structure will be made up of prefabricated roof trusses manufactured off site to minimise timber cutting on site. The construction of the underground electrical cabling will consist of excavating sections of a trench, laying the ducting and cabling and backfilling.

The waste types arising from the construction phase of the Proposed Project are outlined in Table 3-2 below.

Table 3-2 Expected waste types arising during the Construction Phase

Material Type	Example	EW Code
Cables	Electrical wiring	17 04 11
Cardboard	Boxes, cartons	15 01 01
Composite packaging	Containers	15 01 05
Metals	Copper, aluminium, lead, iron and steel	17 04 07
Inert materials	Sand, stones, plaster, rock, blocks	17 01 07
Mixed municipal waste	Daily canteen waste from construction workers, miscellaneous	20 03 01
Plastic	PVC frames, electrical fittings	17 02 03
Plastic packaging	Packaging with new materials	15 01 02
Tiles and ceramics	Slates and tiles	17 01 03
Wooden packaging	Boxes, pallets	15 01 03
Tarmac/Bitumen	Road surfacing along the Proposed Grid Connection underground cabling route	17 03 02

Hazardous wastes that may occur on site during the construction phase of the Proposed Project may include oil, diesel fuel, chemicals, paints, preservatives etc. All hazardous wastes will be stored in bunded containers/areas before being collected by an authorised waste contractor and brought to an EPA licensed waste facility. As mentioned above, hazardous wastes will be kept separate from non-hazardous wastes so that contamination does not occur.

3.8.3.2 Waste Arising and Proposals for Minimisation, Refuse and Recycling of Construction Waste

Construction waste will arise on the project mainly from excavation and unavoidable construction waste including material surpluses and damaged materials and packaging waste.

Appropriate measures will be taken to ensure excess waste is not generated during construction, including:

- Ordering of materials will be on an 'as needed' basis to prevent over supply to the Site. Co-ordination is required with suppliers enabling them to take/buy back surplus stock;
- Purchase of materials pre-cut to length to avoid excess scrap waste generated on-site;
- Request that suppliers use least amount of packaging possible on materials delivered to the Site;
- Ensuring correct storage and handling of goods to avoid unnecessary damage that would result in their disposal;
- Ensuring correct sequencing of operations;
- Use reclaimed materials in the construction works.

Hazardous waste will be kept separate from all other construction waste to prevent contamination and removed appropriately.

3.8.3.3 Waste Arising from Construction Activities

All waste generated on site will be contained in waste skips at a waste storage area on site. This waste storage area will be kept tidy with skips clearly labelled to indicate the allowable material to be disposed of therein.

The expected waste volumes generated on site are unlikely to be large enough to warrant source segregation at the Site. Therefore, all wastes streams generated on site will be deposited into a single waste skip. This waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal.

The waste generated from the turbine erection will be limited to the associated protective covers which are generally reusable. Considering the specialist nature of this packaging material the majority will be taken back by suppliers for their own reuse. Any other packaging waste generated from the turbine supply will be deposited into the on-site skips and subsequently transferred to the MRF.

It is not envisaged that there will be any waste material arising from the materials used to construct the site roads as only the quantity of stone necessary will be sourced from local quarries and brought on site on an 'as needed' basis.

Site personnel will be instructed at induction that under no circumstances can waste be brought to site for disposal in the on-site waste skip. It will also be made clear that the burning of waste material on site is forbidden.

3.8.3.4 Waste Arising from Decommissioning

The design life of the proposed renewable energy development is 35 years after which time a decision will be made to determine whether or not the turbines will be replaced by new turbines or if decommissioning will occur. The lengthy time frame between the completion of the construction phase and decommissioning will result in the only materials remaining on site at that time will be infrastructural material such as the turbine foundations, turbines and the granular material used to construct roads. When the Site is decommissioned, cranes will disassemble each turbine tower and all equipment. The associated components will be removed from site for re-use, recycling or waste disposal. Any structural elements that are not suitable for recycling will be disposed of in an appropriate manner. All lubrication fluids will be drained down and put aside for appropriate collection, storage, transport and disposal. Any materials which cannot be re-used or recycled will be disposed of by an appropriately licenced contractor.

The waste types arising from the decommissioning of the Proposed Project are outlined in Table 3-3 below.

Table 3-3 Expected Waste types arising during the Decommissioning Phase

Material Type	Example	EW Code
Cables	Electrical wiring	17 04 11
Metals	Copper, aluminium, lead, iron and rebar	17 04 07
Inert materials	Crushed stone, concrete	17 01 07

Lubricating Oils/Fluids	Oils used within wind turbines	13 02 04
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3.8.3.5 Reuse

Many construction materials can be reused a number of times before they have to be disposed of:

- Concrete can be reused as aggregate for roads or cable trench backfilling material.
- Plastic packaging etc. can be used to cover materials on site or reused for the delivery of other materials.

3.8.3.6 Recycling

If a certain type of construction material cannot be reused onsite, then recycling is the most suitable option. The opportunity for recycling on site will be restricted to the associated packaging from the wind turbines.

All waste that is produced during the construction phase including dry recyclables will be deposited in the on-site skip initially and sent for subsequent segregation at a remote facility. The anticipated volume of all waste material to be generated at the development is low which provides the justification for adopting this method of waste management.

3.8.3.7 Implementation

3.8.3.7.1 Roles and Responsibilities for Waste Management

Prior to the commencement of the development a Construction Waste Manager will be appointed by the Contractor. The Construction Waste Manager will be in charge of the implementation of the objectives of the plan, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on the development adheres to the management plan

3.8.3.7.2 Training

It is important for the Construction Waste Manager to communicate effectively with colleagues in relation to the aims and objectives of the waste management plan. All employees working on site during the construction phase of the project will be trained in materials management and thereby, should be able to:

- Distinguish reusable materials from those suitable for recycling;
- Ensure maximum segregation at source;
- Co-operate with site manager on the best locations for stockpiling reusable materials;
- Separate materials for recovery; and
- Identify and liaise with waste contractors and waste facility operators.

3.8.3.7.3 Record Keeping

The Waste Management Plan (WMP) will provide systems that will enable all arisings, movements and treatments of construction waste to be recorded. This system will enable the contractor to measure and record the quantity of waste being generated. It will highlight the areas from which most waste occurs and allows the measurement of arisings against performance targets. The WMP can then be adapted with changes that are seen through record keeping.

The fully licensed waste contractor employed to remove waste from the Site will be required to provide documented records for all waste dispatches leaving the Site. Each record will contain the following:

- Consignment Reference Number
- Material Type(s) and EWC Code(s)
- Company Name and Address of Site of Origin
- Trade Name and Collection Permit Ref. of Waste Carrier
- Trade Name and Licence Ref. of Destination Facility
- Date and Time of Waste Dispatch
- Registration no. of Waste Carrier vehicle
- Weight of Material
- Signature of Confirmation of Dispatch detail
- Date and Time of Waste Arrival at Destination
- Site Address of Destination Facility

3.8.3.8 Waste Management Plan Conclusion

The WMP will be properly adhered to by all staff involved in the Proposed Project which will be outlined within the induction process for all site personnel. The waste hierarchy will always be employed when designing the plan to ensure that the least possible amount of waste is produced during the construction phase. Reuse of certain types of construction wastes will cut down on the cost and requirement of raw materials therefore further minimising waste levels.

This preliminary WMP has been prepared to outline the main objectives that are to be adhered to for the preparation of a more detailed WMP to be completed after the planning phase of the Proposed Project.

4. ENVIRONMENTAL MANAGEMENT IMPLEMENTATION

4.1 Roles and Responsibilities

The Project Developer will appoint a design team to prepare the detailed design for the Proposed Project prior to the commencement of construction and ensure all planning and environmental obligations are met. The developer will appoint a Project Contractor who will be responsible for the construction of the Proposed Project in accordance with this CEMP which will be updated by the contractor as required during the construction phase of the Proposed Project. Any updated CEMP must meet or exceed the standards and requirements set out in this document.

The Environmental Clerk of Works (ECoW) will be nominated by the Project Developer to oversee the Project Contractor's effective implementation of the Proposed Project's environmental requirements and obligations, as captured in the CEMP. The ECoW will be responsible for monitoring the works of the Project Contractor from an environmental perspective on behalf of the Project Developer. For the sake of expediency, the ECoW will report their ongoing audit findings, monitoring results and site observations to both the Project Developer and the Project Contractor, having been nominated by the developer to fulfil the role.

The ECoW will have the power to halt the works, should the need arise and will be supported by the developer to ensure the contractor adheres to such an instruction.

The ECoW will also have to call upon the Project Ecologist, Project Hydrologist, or other members of the Project Developer's design team, as required, to oversee the contractor's works on-site.

An organogram structure for the construction stage roles is as outlined below.

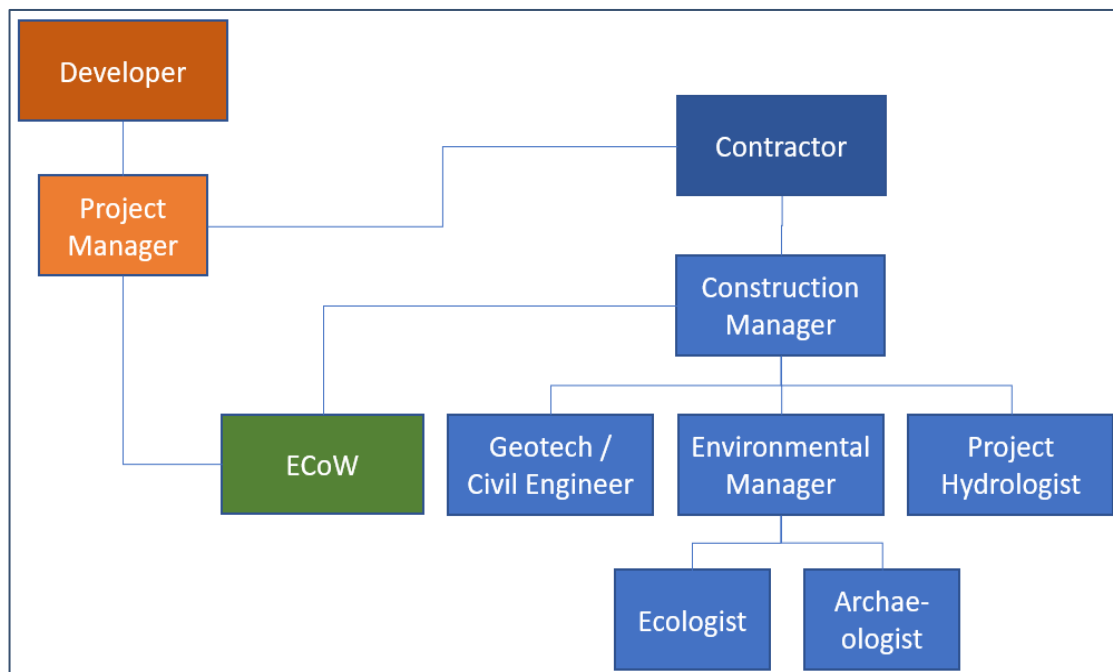


Plate 4-1 Proposed Project Organogram

Any requirement of the granted permission, for the works to be supervised by an engineer with professional indemnity insurance, who upon completion of the works, shall certify the said works, will

be adhered to. Such an engineer will be appointed to oversee and supervise the construction phase of the Proposed Project.

4.1.1 Construction Manager

The Project Contractor will be required to nominate a Construction Manager who will have responsibility for the organisation and execution of environmental requirements outlined in this CEMP or any further versions thereof. The Construction Manager will have an assigned deputy who will fulfil the role of Environmental Manager. To implement the CEMP, the Construction Manager with the assistance of the Environmental Manager will be required to:

- Implement all Proposed Project design requirements to minimise environmental risk;
- Implement all CEMP requirements and measures to minimise environmental risk;
- Ensure any site personnel responsible for directing works on site are familiar with all requirements of the CEMP;
- Propose revisions to the Proposed Project's CEMP for approval of the Project Developer, project design team and ECoW, only where any such revisions meet or exceed the standards and requirements set out in this document;
- Ensure that all environmental standards are achieved during the construction phase of the Proposed Project;
- Promptly implement any remedial action required to rectify and close-out any non-compliant items identified by the ECoW;
- Ensure immediate notification of environmental incidents are issued to the ECoW, the Project Developer and the relevant authorities, initially by phone and as soon as is practicable by e-mail;
- Identify environmental training requirements and arrange relevant training for all levels of site-based staff/workers.
- Ensure that all construction activities are planned and performed such that minimal risk to the environment is introduced.

4.1.2 Site Environmental Clerk of Works

The Project Developer will be required to engage a qualified Environmental Engineer, Environmental Scientist, or equivalent, with experience in wind farm construction to fulfil the role of Environmental Clerk of Works (ECoW) to oversee the construction works and audit the implementation of the CEMP. The ECoW will report to the Project Developer and Project Contractor but will liaise closely with the Construction Manager in relation to the Project Contractor's day-to-day implementation of the CEMP on site. The responsibilities and duties of the ECoW will include the following:

- Review/approval of the CEMP and supporting environmental documentation and review/approval of contractor method statements;
- Undertake environmental monitoring, inspections and reviews to ensure the works are carried out in compliance with the CEMP by the Project Contractor;
- Manage the water quality monitoring programme and turbidity monitors;
- Maintain a live Actions List and accompanying map outlining any corrective actions across the Site requiring attention or action by the contractor;
- Confirm for the Project Contractor that pre-commencement requirements have been met to allow construction activities to commence;
- Highlight for the contractor, any abandonment triggers that are occurring and inform the contractor that works are to cease;
- Generate environmental reports as required to show environmental data trends and ensure environmental records are maintained throughout the construction period;
- Advise site management/contractor/sub-contractors on:
 - Prevention of environmental pollution and improvement to existing working methods;

- Changes in legislation and legal requirements affecting the environment;
- Suitability and use of plant, equipment and materials to prevent pollution;
- Environmentally sound methods of working and systems to identify environmental hazards;
- Assist the contractor in coordinating the required inputs and site visits from the Project Ecologist or Project Hydrologist to support the ECoW role;
- Ensure immediate notification of any environmental incidents are issued to the Construction Manager and Project Developer;
- Support the investigation of incidents of significant, potential or actual environmental damage and ensure corrective actions are carried out, recommend means to prevent recurrence and communicate incident findings to relevant parties.
- Liaise with the Project Design Team and attend meetings to report on audit findings.
- Support the contractor who will be responsible for providing toolbox talks and site induction content to ensure the requirements of the CEMP are delivered on site.
- The geotechnical design requirements of the Proposed Project are not within the remit of the ECoW.

The level, detail and frequency of reporting expected from the ECoW for the Construction Manager, Developer's Project Manager, and any Authorities or other Agencies, will be agreed by all parties prior to commencement of construction, and may be further adjusted as required during the course of the Proposed Project.

4.1.3 Project Ecologist/Ornithologist

The Project Ecologist/ Ornithologist will be available to support the ECoW on matters relating to the protection of sensitive habitats and species encountered prior to or during the construction phase of the Proposed Project. The Project Ecologist will not be full time on site but will undertake pre-commencement surveys and visit the Site as required. The responsibilities and duties of the Project Ecologist/Ornithologist will include the following:

- Undertake a pre-construction transect/walkover bird survey to ensure that significant effects on breeding birds will be avoided.
- Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Site.
- Oversee management of ornithological and ecological issues during the construction period and advise on ornithological issues as they arise.
- Provide guidance to contractors to ensure legal compliance with respect to protected species onsite.
- Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress.

4.1.4 Project Hydrologist

The Project Hydrologist is part of the design team that will prepare the detailed drainage design for the construction phase of the Proposed Project, but will also support the ECoW in monitoring, overseeing and auditing the effective implementation of the detailed drainage design by the Project Contractor. The Project Hydrologist will not be full time on site but will be required to visit as necessary to oversee the implementation of their drainage design.

The responsibilities and duties of the Project Hydrologist will include the following:

- Preparation of detailed drainage design before construction commences;
- Input to the CEMP in respect of drainage design and water quality management;
- Attend site to support ECoW and oversee and audit the effective implementation of the detailed drainage design;

- Complete ongoing inspection and monitoring of the development, particularly in areas of drainage control in support of the ECoW in monitoring the effectiveness of the drainage design as it is implemented on-site.

4.1.5 **Project Archaeologist**

The Project Archaeologist will report to the Environmental Manager/ECoW and is responsible for archaeological monitoring of the Site during the construction phase. This will include monitoring of site investigations and excavation works as well as the monitoring and metal detection of spoil during construction.

If new archaeological material is detected during the pre-construction re-inspection, testing or monitoring, the project archaeologist will be responsible for ensuring they are preserved by record (archaeologically excavated) and therefore permanently removed with a full record made.

4.1.6 **Project Geotechnical Engineer/Civil Engineer**

The Geotechnical Engineer will report to the Construction Manager and is responsible for inspection and review of geotechnical aspects associated with construction of the Proposed Project. The Geotechnical Engineer will not be full time on site but will visit site at least once a month during the construction phase civil works and on a weekly basis during site preparation/groundworks.

The responsibilities and duties of the Geotechnical Engineer will include the following:

- Visit site regularly, or at least once a month during the construction phase, to complete geotechnical audits and reviews and report any issues to the Construction Manager;
- Ensuring that identified hazards are listed in the Geotechnical Risk Register and that these are subject to ongoing monitoring; and,
- Ongoing inspection and monitoring of the Proposed Project, particularly in temporary stockpile areas, through all phases of construction (including pre, during and post construction) and ensure construction is carried out as specified in the EIAR, NIS and in relevant planning conditions.

4.2 **Water Quality and Monitoring**

4.2.1 **Pre-Construction Baseline Monitoring**

Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement of felling and construction at the Site.

Analysis will be for a range of parameters with relevant regulatory limits along with Environmental Quality Standards (EQSs) and sampling will be undertaken at designated locations as outlined in Figure 9-6 of the EIAR.

Baseline sampling will be completed on at least two occasions, and these should ideally coincide with low flow and high flow stream conditions. The high flow sampling event will be undertaken after a period of sustained rainfall, and the low flow event will be undertaken after a dry spell.

4.2.2 **Construction Phase Monitoring**

4.2.2.1 **Daily Visual Inspections**

An inspection and maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works. Daily visual inspections of drains and outfalls will also be

performed during the construction period to ensure suspended solids are not entering streams and rivers on site, to identify any obstructions to channels and to allow appropriate maintenance of the drainage regime. Should the suspended solids levels measured during construction be higher than the existing levels, the source will be identified, and additional mitigation measures implemented. Any excess build-up of silt levels at dams, the settlement pond, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed.

Inspection sheets and photographic records will be kept on site. Inspection points will include the in-situ field monitoring point locations and the laboratory analysis sampling points. Inspection points will depend on works being completed within the catchment upstream of the identified monitoring locations. Visual inspections will also be completed after major rainfall events, i.e. after events of >25mm rainfall in any 24-hour period and data including photographs will be collected by visual inspections and independently assessed by the Project Hydrologist who will monitor and advise on the records being received.

The following periodic inspection regime will be implemented:

- Daily general visual inspections of site operations and inspections of all drainage infrastructure within the Site and in the surrounding area by the ECoW or a suitably qualified and competent person as delegated by the ECoW;
- Inspections to include all elements of drainage infrastructure to ensure the system is operating correctly and to identify and maintenance that is required. Any changes, such as discolouration, odour, oily sheen or litter will be noted and corrective action will be implemented. High risk locations such as settlement ponds will be inspected daily. Daily inspections checks will be completed on plant and equipment, and whether materials such as straw bales or oil absorbent materials need replacement;
- Event based inspections by the ECoW as follows:
 - >10 mm/hr (i.e. high intensity localised rainfall event);
 - >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day);
 - or,
 - Rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week).
- Monthly site inspections by the Project Hydrologist/ ECoW during construction phase;
- Quarterly site inspections by the Project Hydrologist/ ECoW after construction for a period of one year following the construction phase; and,
- A written record will be maintained or available on-site within this CEMP which will be maintained on-site during the construction phase.

4.2.2.2 Continuous Turbidity Monitoring

Turbidity monitors or sondes can be installed where required at locations surrounding the Site. The sondes will provide continuous readings for turbidity levels in the watercourse. This equipment will be supplemented by daily visual monitoring at their locations as outlined in the sections below.

4.2.2.3 Laboratory Analysis

Baseline laboratory analysis of a range of parameters with relevant regulatory limits and EQSs will be undertaken as per water monitoring programme for the Proposed Project. This will not be restricted to just these locations around the proposed renewable energy development site with further sampling points added as deemed necessary by the ECoW in consultation with the Project Hydrologist and Site Manager.

4.2.2.4 Field Monitoring

Field chemistry measurements of unstable parameters, (pH, conductivity, temperature) will be taken at the surface water monitoring locations, as per water monitoring programme for the Proposed Project. These analyses will be carried out by either the ECoW or the Project Hydrologist. In-situ field monitoring will also be completed after major rainfall events, i.e. after events of >25mm rainfall in any 24-hour period. The Project Hydrologist will monitor and advise on the readings collected by in-situ field monitoring.

4.2.2.5 Monitoring Parameters

The analytical determinants of the monitoring programme (including limits of detection and frequency of analysis) will be as per S.I. No. 272 of 2009 European Communities Environmental Objectives (Surface Waters) Regulations and European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009. The likely suite of determinants will include:

- > pH (field measured)
- > Electrical Conductivity (field measured)
- > Temperature (field measured)
- > Dissolved Oxygen (field measured)
- > Alkalinity (pH measured)
- > Total Phosphorus
- > Chloride
- > Nitrate
- > Nitrite
- > Total Nitrogen
- > Ortho-Phosphate
- > Total Ammonia N
- > Biochemical Oxygen Demand
- > Total Suspended Solids
- > True Colour
- > Dissolved organic carbon

4.2.3 Construction Phase Drainage Inspections & Maintenance

Drainage performance will form part of the civil works contract requirements. During the construction phase, the Project Contractor will be responsible for the effectiveness of drainage measures. This responsibility extends to drainage maintenance, to ensure that the installed drainage measures continue to perform as intended by the detailed drainage design. Silt fences, check dams, level spreaders and other drainage measures likely to form part of the detailed drainage design, require regular maintenance to ensure they continue to function effectively, and the Project Contractor is entirely responsible for this maintenance.

Regular inspections of all existing and installed drainage measures should be undertaken by the Project Contractor, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water within the system. The contractor will devise a system of recording the findings of these inspections. Any excess build-up of silt levels at check dams, the settlement ponds, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed. For this reason, the drainage measures installed on-site should be inspected at least weekly by the contractor and maintained as required during the construction phase of the Proposed Project to ensure good performance.

The ECoW will monitor the effectiveness of the on-site drainage during changing weather, ground or drainage conditions encountered on site, through their regular visual inspections of on-site watercourses and water monitoring programme. Where it appears that additional drainage measures will be required to ensure the drainage system remains effective, the ECoW will notify the contractor, the developer and project design team including the Project Hydrologist. The ECoW's role in this regard does not replace the need for the weekly (at least) inspections of the drainage system's measures by the Project Contractor.

4.2.4 Surface Water Monitoring Reporting

Visual inspection and laboratory analysis results of water quality monitoring shall assist in determining requirements for any necessary improvements in drainage controls and pollution prevention measures implemented on site.

It will be the responsibility of the ECoW to present the ongoing results of water quality and weather monitoring at or in advance of regular site meetings.

Reports on water quality will consider all field monitoring and visual inspections, and results of laboratory analysis completed for that period. Reports will describe how the results compare with baseline data as well as previous reports on water quality. The reports will also describe whether any deterioration or improvement in water quality has been observed whether any effects are attributable to construction activities and what remedial measures, or corrective actions have been implemented. Any proposed alteration to sampling frequency will be agreed with the Planning Authority in advance.

4.3 Environmental Awareness and Training

4.3.1 Environmental Induction

The Environmental Induction will be integrated into the general site induction on a case-by-case basis for each member of staff employed on-site depending on their assigned roles and responsibilities on site.

Where necessary, the Environmental Induction will as a minimum include:

- A copy of the Environmental Management Site Plans and discussion of the key environmental risks and constraints;
- An outline of the CEMP structure;
- A discussion of the applicable Works Method Statement;
- The roles and responsibilities of staff, including contractors, in relation to environmental management; and,
- An outline of the environmental Incident Management Procedure.

4.3.2 Toolbox Talks

Toolbox talks would be held by the ECoW or Construction Manager at the commencement of each day, or at the commencement of new activities. The aims of the toolbox talks are to identify the specific work activities that are scheduled for that day or phase of work. In addition, the necessary work method statements and sub plans would be identified and discussed prior to the commencement of the day's activities. The toolbox talks will include training and awareness on topics including:

- On-site Ecological Sensitivities;
- Buffers to be upheld – watercourses, archaeology, ecology;
- Sediment and Erosion Control;
- Good site practice;

- > On-site Traffic Routes and Rules;
- > Keeping to tracks – vehicle rules;
- > Strictly adhering to the development footprint;
- > Fuel Storage;
- > Materials and waste procedures

Site meetings would be held on a regular basis involving all site personnel. The objectives of site meetings is to discuss the coming weeks activities and identify the relevant work method statements and sub plans that will be relevant to that week's activities. Additionally, any non-compliance identified during the previous week would also be discussed with the aim to reduce the potential of the same noncompliance reoccurring.

During construction of the Proposed Project, all staff will be made aware of and adhere to the Health & Safety Authority's *'Guidelines on the Procurement, Design and Management requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013'*. This will encompass the use of all necessary Personal Protective Equipment and adherence to Health and Safety Plan.

5. HEALTH AND SAFETY

Construction of the Proposed Project will necessitate the presence of a construction site and travel on the local public road network to and from the Site. Construction sites and the machinery used on them pose a potential health and safety hazard to construction workers if site rules are not properly implemented. The Proposed Project will be constructed in accordance with all relevant Health and Safety Legislation, including:

- Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005);
- Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2016 (S.I. No. 36 of 2016);
- S.I. No. 528/2021 - Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021 and
- Safety, Health and Welfare at Work (Work at Height) Regulations 2006 (S.I. No. 318 of 2006).

The following measures below are also detailed in Chapter 18 Schedule of Mitigation and outlined in Table 7-1 and 8-1 below.

- A Health and Safety Plan covering all aspects of the construction process will address the Health and Safety requirements in detail. This will be prepared on a preliminary basis at the procurement stage and developed further at construction stage.
- All hazards will be identified, and risks assessed. Where elimination of the risk is not feasible, appropriate mitigation and/or control measures will be established. The contractor will be obliged under the construction contract and current health and safety legislation to adequately provide for all hazards and risks associated with the construction phase of the project. Safepass registration cards are required for all construction, delivery and security staff. Construction operatives will hold a valid Construction Skills Certificate Scheme card where required. The developer is required to ensure a competent contractor is appointed to carry out the construction works. The contractor will be responsible for the implementation of procedures outlined in the Safety and Health Plan. Public safety will be addressed by restricting Site access during construction. Fencing will be erected in areas of the Site where uncontrolled access is not permitted.
- The suitability of machinery and equipment for use near power lines will be risk assessed.
- All staff will be trained on operating voltages of overhead electricity lines running over the Site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the Site will be made aware of the location of overhead electricity lines before they come on to Site.
- Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire.
- When activities must be carried out beneath overhead lines, e.g., component delivery or substation construction, a Site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works. Overhead line proximity detection equipment will be fitted to machinery when such works are required.
- Information on safe clearances will be provided to all staff and visitors.
- Signage indicating locations and health and safety measures regarding overhead lines
- All staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021'. This will

encompass the use of all necessary Personal Protective Equipment and adherence to Health and Safety Plan.

- All staff will operate relevant machinery as per requirements of the Machinery Directive 2006/42/EC

The scale and scope of the project necessitates that a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Health & Safety Authority's *'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013'*. The PSDP appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to):

- Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the project;
- Where possible, eliminate the hazards or reduce the risks;
- Communicate necessary control measures, design assumptions or remaining risks to the PSCS so they can be dealt with in the Safety and Health Plan;
- Ensure that the work of designers is coordinated to ensure safety;
- Organise co-operation between designers;
- Prepare a written Safety and Health Plan;
- Prepare a safety file for the completed structure and give it to the client; and
- Notify the Authority and the client of non-compliance with any written directions issued.

The PSCS appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to):

- Development of the Safety and Health Plan for the construction stage with updating where required as work progresses;
- Compile and develop safety file information.
- Reporting of accidents / incidents;
- Weekly Site meeting with PSCS;
- Coordinate arrangements for checking the implementation of safe working procedures. Ensure that the following are being carried out:
 - Induction of all Site staff including any new staff enlisted for the project from time to time;
 - Toolbox talks as necessary;
 - Maintenance of a file which lists personnel on Site, their name, nationality, current Safe Pass number, current Construction Skills Certification Scheme (CSCS) card (where relevant) and induction date;
 - Report on Site activities to include but not limited to information on accidents and incidents, disciplinary action taken and PPE compliance;
 - Monitor the compliance of contractors and others and take corrective action where necessary; and
 - Notify the Authority and the client of non-compliance with any written directions issued.

6. EMERGENCY RESPONSE PLAN

6.1 Overview

The Emergency Response Plan (ERP) is presented in this section of the CEMP. It provides details of procedures to be adopted in the event of an emergency. The ERP includes details on the response required and the responsibilities of all personnel in the event of an emergency. The ERP will require updating and submissions from the contractor/PSCS and suppliers as the project progresses. Where sub-contractors that are contracted on site are governed by their own emergency response procedure a bridging arrangement will be adopted to allow for inclusion of the sub-contractor's ERP within this within this document.

This is a working document that requires updating throughout the various stages of the Proposed Project.

6.1.1 Roles and Responsibilities

The chain of command during an emergency response sets out who is responsible for coordinating the response. The Site Supervisor/Construction Manager will lead the emergency response which makes him responsible for activating and coordinating the emergency response procedure. The other site personnel who can be identified at this time who will be delegated responsibilities during the emergency response are presented in Figure 6-1. In a situation where the Site Supervisor/ Construction Manager is unavailable or incapable of coordinating the emergency response, the responsibility will be transferred to the next person in the chain of command outlined in Figure 6-1. This will be updated throughout the various stages of the Proposed Project.

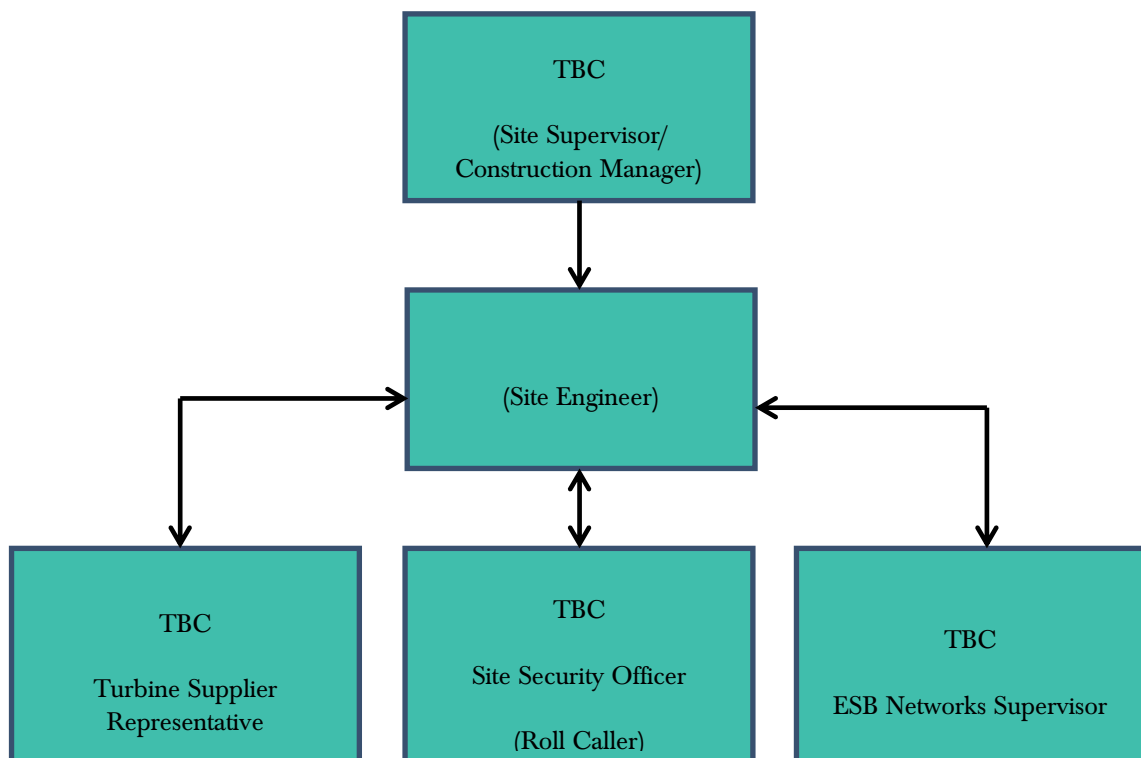


Plate 6-1 Emergency Response Procedure Chain of Command

6.1.2 Hazard Identification

In order to establish the type and scale of potential emergencies that may occur, the following hazards have been identified as being potential situations that may require an emergency response in the event of an occurrence.

Table 6-1 Hazards associated with potential emergency situations

Hazard	Emergency Situation
Construction Vehicles: Dump trucks, tractors, excavators, cranes etc.	Collision or overturn which has resulted in operator or third-party injury.
Abrasive wheels/Portable Tools	Entanglement, amputation or electrical shock associated with portable tools.
Contact with services	Electrical shock or gas leak associated with an accidental breach of underground services.
Fire	Injury to operative through exposure to fire.
Falls from heights including falls from scaffold towers, scissor lifts, ladders, roofs and turbines.	Injury to operative after a fall from a height.
Sickness	Illness unrelated to site activities of an operative e.g., heart attack, loss of consciousness, seizure.
Turbine Specific Incident	This will be included when the upon agreement and section of the final turbine type.
Siltation of watercourses, Fuel Management and Spill Control	Run-off to watercourses causing pollution.

In the event of an emergency situation associated with, but not restricted to, the hazards outlined in Table 6-1 the Site Supervisor/Construction Manager will carry out the following:

- Establish the scale of the emergency situation and identify the number of personnel, if any, have been injured or are at risk of injury.
- Where necessary, sound the emergency siren/foghorn that activates an emergency evacuation on the Site. The Site Supervisor/Construction Manager must proceed to the assembly point if the emergency poses any significant threat to their welfare and if there are no injured personnel at the scene that require assistance. The Site Supervisor/Construction Manager will be required to use their own discretion at that point. In the case of fire, the emergency evacuation of the Site should proceed, without exception. The Site evacuation procedure is outlined in Section 6.1.3.
- Make safe the area if possible and ensure that there is no identifiable risk exists with regard to dealing with the situation e.g., if a machine has turned over, ensure that it is in a safe position so as not to endanger others before assisting the injured.
- Contact the required emergency services or delegate the task to someone. If delegating the task, ensure that the procedures for contacting the emergency services as set out in Section 6.3 is followed.
- Take any further steps that are deemed necessary to make safe or contain the emergency incident e.g., cordon off an area where an incident associated with electrical issues has occurred.

- Contact any regulatory body or service provider as required e.g., ESB Networks the numbers for which as provided in Section 6.3.
- Contact the next of kin of any injured personnel where appropriate.

6.1.3 Site Evacuation/Fire Drill

A site evacuation/fire drill procedure will provide basis for carrying out the immediate evacuation of all site personnel in the event of an emergency. The following steps will be taken:

- Notification of the emergency situation. Provision of a siren or foghorn to notify all personnel of an emergency situation.
- An assembly point will be designated in the construction compound area and will be marked with a sign. All site personnel will assemble at this point.
- A roll call will be carried out by the Site Security Officer to account for all personnel on site.
- The Site Security Officer will inform the Site Supervisor/Construction Manager when all personnel have been accounted for. The Site Supervisor/Construction Manager will decide the next course of action, which be determined by the situation that exists at that time and will advise all personnel accordingly.

All personnel will be made aware of the evacuation procedure during site induction. The Fire Services Acts of 1981 and 2003 require the holding of fire safety evacuation drills at specified intervals and the keeping of records of such drills.

6.1.4 Spill Control Measures

Every effort will be made to prevent an environmental incident during the construction and operational phase of the Proposed Project. Oil/fuel spillages are one of the main environmental risks that will exist on the Site which will require an emergency response procedure. The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. The following steps provide the procedure to be followed in the event of such an incident:

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident.
- Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill.
- If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses or sensitive habitats.
- If possible, clean up as much as possible using the spill control materials.
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the ECoW immediately giving information on the location, type and extent of the spill so that they can take appropriate action.
- The ECoW will inspect the Site and will assist by providing any advice possible to ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.
- The Construction Manager will notify the appropriate regulatory body such as Mayo County Council, Inland Fisheries Ireland (IFI), National Parks and Wildlife Service (NPWS), etc. if deemed necessary.

The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. Environmental incidents are not limited to just fuel spillages. Therefore, any environmental incident must be investigated in accordance with the following steps.

- The ECoW must be immediately notified.
- If necessary, the Construction Manager will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident.
- The details of the incident will be recorded on an Environmental Incident Form which will provide information such as the cause, extent, actions and remedial measures used following the incident. The form will also include any recommendations made to avoid reoccurrence of the incident.
- If the incident has impacted on an ecologically sensitive receptor, such as a sensitive habitat, protected species or designated conservation site (pSPA or cSAC), the ECoW will liaise with the Project Ecologist.
- If the incident has impacted on a sensitive receptor such as an archaeological feature the ECoW will liaise with the Project Archaeologist.

A record of all environmental incidents will be kept on file by the ECoW and the Project Contractor. These records will be made available to the relevant authorities such as Mayo County Council, IFI, NPWS, etc. if required. The ECoW will be responsible for any corrective actions required as a result of the incident e.g. an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the Project Contractor as appropriate.

6.2 Contacting the Emergency Services

6.2.1 Emergency Communications Procedure

In the event of requiring the assistance of the emergency services the following steps will be taken:

Stay calm. It is important to take a deep breath and not get excited. Any situation that requires 999/112 is, by definition, an emergency. The dispatcher or call-taker knows that and will try to move things along quickly, but under control.

Know the location of the emergency and the number you are calling from. This may be asked and answered a couple of times but do not get frustrated. Even though many emergency call centres have enhanced capabilities meaning they are able to see your location on the computer screen they are still required to confirm the information. If for some reason you are disconnected, at least emergency crews will know where to go and how to call you back.

Wait for the call-taker to ask questions, then answer clearly and calmly. If you are in danger of assault, the dispatcher or call-taker will still need you to answer quietly, mostly "yes" and "no" questions.

If you reach a recording, listen to what it says. If the recording says your call cannot be completed, hang up and try again. If the recording says all call takers are busy, WAIT. When the next call-taker or dispatcher is available to take the call, it will transfer you.

Let the call-taker guide the conversation. He or she is typing the information into a computer and may seem to be taking forever. There is a good chance, however, that emergency services are already being sent while you are still on the line.

Follow all directions. In some cases, the call-taker will give you directions. Listen carefully, follow each step exactly, and ask for clarification if you do not understand.

Keep your eyes open. You may be asked to describe victims, suspects, vehicles, or other parts of the scene.

Do not hang up the call until directed to do so by the call taker.

Due to the remoteness of the Site it may be necessary to liaise with the emergency services on the ground in terms of locating the Site. This may involve providing an escort from a designated meeting point that may be located more easily by the emergency services. This should form part of the site induction to make new personnel and sub-contractors aware of any such arrangement or requirement if applicable.

6.3 Contact Details

A list of emergency contacts is presented in Table 6-2. A copy of these contacts will be included in the Site Safety Manual and in the site offices and the various site welfare facilities.

Table 6-2 Emergency Contacts

Contact	Telephone no.
Emergency Services – Ambulance, Fire, Gardaí	999/112
Doctor – Claremorris Primary Care Centre	094 937 8500
Hospital – Mayo University Hospital – Castlebar, Co. Mayo	094 902 1733
ESB Emergency Services	1800 372 999
Gas Networks Ireland Emergency	1800 20 50 50
Gardaí – Claremorris Garda Station	094 937 2080
Health and Safety Co-ordinator - Health & Safety Services	TBC
Health and Safety Authority	0818 289 389
Inland Fisheries Ireland (IFI)	0818 347 424
Project Supervisor Construction Stage (PSCS): TBC	TBC
Project Supervisor Design Stage (PSDS): TBC	TBC
Client: Cunlaghfadda Green Energy	086 852 5000

7.1 Procedure for Personnel Tracking

All operatives on site without any exception will have to undergo a site induction where they will be required to provide personal contact details which will include contact information for the next of kin.

In the event of a site operative becoming in an emergency situation where serious injury has occurred and hospitalisation has taken place, it will be the responsibility of the Site Manager or next in command if unavailable to contact the next of kin to inform them of the situation that exists.

7.2 Induction Checklist

Table 6-3 provides a list of items highlighted in this ERP which must be included or obtained during the mandatory site induction of all personnel that will work on the Site. This will be updated throughout the various stages of the Proposed Project.

Table 6-3 Emergency Response Plan Items Applicable to the Site Induction Process

ERP Items to be included in Site Induction	Status
All personnel will be made aware of the evacuation procedure during site induction	
It may be necessary to liaise with and assist the emergency services on the ground in terms of locating the Site. This may involve providing an escort from a designated meeting point that may be located more easily by the emergency services. This should form part of the site induction to make new personnel and sub-contractors aware of any such arrangement or requirement if applicable.	
All operatives on site without any exception will have undergone a site induction where they will be required to provide personal contact details which will include contact information for the next of kin.	

8.

MITIGATION PROPOSALS

All mitigation measures relating to the pre-commencement, construction and operational phases of the Proposed Project are set out in the various sections of the Environmental Impact Assessment Report (EIAR), NIS prepared as part of the planning application to Mayo County Council.

This section of the CEMP groups together all of the mitigation measures presented in the above sections. The Mitigation Measures are presented in the following pages and are also outlined within Chapter 18 Schedule of Mitigation and Monitoring Measures. Decommissioning Phase mitigation measures are not included in the table below, however, can be viewed in Appendix 4-6 (Decommissioning Plan) of the EIAR.

By presenting the mitigation proposals in the below format, it is intended to provide an easy to audit list that can be reviewed and reported on during the future phases of the Proposed Project. The tabular format in which the below information is presented, can be further expanded upon during the course of future project phases to provide a reporting template for site compliance audits

Table 8-1 Proposed Mitigation Measures

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
ELAR Chapter 4 – Description of the Proposed Project					
Pre-Construction Phase					
MM1	Environmental Management	Chapter 4	➤ All proposed activities on the Site will be provided for in a Construction and Environmental Management Plan (CEMP). A CEMP has been prepared for the Proposed Project and is included in Appendix 4-5 of this EIAR. ➤ The CEMP sets out the key environmental considerations to be considered by the contractor during construction of the Proposed Project. The CEMP includes details of drainage, peat and spoil management, waste management, and details the mitigation and monitoring measures to be implemented in order to comply with the environmental commitments outlined in the EIAR and NIS. ➤ The contractor will be contractually obliged to comply with all such measures. In the event planning permission is granted for the Proposed Project, the CEMP will be updated prior to the commencement of the development, to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned and will be submitted to the Planning Authority for approval.		
MM2	Surface Water Quality	Appendix 4-5	➤ Water quality field testing and laboratory analysis will be undertaken prior to commencement of felling and construction at the site. ➤ Analysis will be for a range of parameters with relevant regulatory limits along with Environmental Quality Standards (EQSs) and sampling will be undertaken at designated locations. ➤ Baseline sampling will be completed on at least two occasions, and these should ideally coincide with low-flow and high-flow stream conditions. The high-flow sampling event will		

			be undertaken after a period of sustained rainfall, and the low-flow event will be undertaken after a dry spell.		
MM3	Drainage Design	Chapter 4 Appendix 4-5	➤ The Project Hydrologist will complete a detailed drainage design and maintenance plan before construction commences and will attend the site to set out and assist with micro-siting of proposed drainage controls.		
MM4	Preparative Site Drainage Management	Chapter 4 Appendix 4-5	➤ All materials and equipment necessary to implement the drainage measures detailed in Chapter 4, will be brought onsite in phases as they are required during the construction phase ➤ A sufficient number of straw bales, clean drainage stone, terram, stakes, etc., will be kept on site at all times to implement the drainage design measures as necessary. The drainage measures detailed in the above will be installed prior to, or at the same time as the works they are intended to drain. ➤ The works programme for the groundworks part of the construction phase of the Proposed Project will also take account of weather forecasts, and predicted rainfall. ➤ Large excavations, large movements of overburden or large-scale overburden or soil stripping will be suspended or scaled back if heavy rain is forecast. ➤ The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.		
MM5	Drainage Inspection	Appendix 4-5	Prior to commencement of works in sub-catchments across the site, main drain inspections will be completed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on a catchment-by-catchment basis as the construction works develop across the site, as works in all areas will not commence simultaneously.		
MM6	Earthworks	Appendix 4-5	➤ Avoid physical damage (river/stream banks and river/stream beds) to watercourses and the associated release of sediment; ➤ Avoid soil disturbance and compaction within close proximity to surface watercourses; ➤ Avoid the entry of suspended sediment from works into watercourses; and,		

			➤ Avoid the entry of suspended sediment from the drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.		
MM7	Traffic Management	Chapter 4, 15 Appendix 4-5 Appendix 15-2	➤ A detailed Traffic Management Plan (TMP), incorporating all the mitigation measures set out within the CEMP along with Chapter 15 Material Assets of the EIAR, will be finalised and detailed provisions in respect of traffic management agreed with the Roads Authority and An Garda Síochána prior to construction works commencing on-site. ➤ Prior to the TMP being finalised, a full dry run of the transport operation along the potential routes will be completed using vehicles with attachments to simulate the dimensions of the wind turbine transportation vehicles. This dry run will inform the TMP for agreement with the relevant Authorities.		
MM8	Waste Management	Chapter 4 Appendix 4-5	Prior to the commencement of the development, a Construction Waste Manager will be appointed by the Contractor. The Construction Waste Manager will be in charge of the implementation of the objectives of the plan, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on the development adheres to the management plan.		
MM9	Tree Felling Drainage	Chapter 4	Keyhole felling to facilitate construction works will take place prior to groundworks commencing. Prior to the commencement of tree felling for subsequent access track construction the following key temporary drainage measures will be installed: ➤ All existing dry forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps; ➤ Clean water diversion drains will be installed upgradient of the works areas; ➤ Check dams/silt fence arrangements (silt traps) will be placed in all existing forestry drains that have surface water flows and also along existing forestry trackside drains; and,		
MM10	Ecological Clerk of Works (ECoW)	Chapter 4	➤ Before the commencement of any felling works, an Environmental Clerk of Works (ECoW) shall be appointed to oversee the keyhole and extraction works. The ECoW shall be experienced and competent, and shall have the following functions and operate their record		

			using a Schedule of Works Operation Record (SOWOR), as proposed in the planning application: ➤ Attend the Site for the setup period when drainage protection works are being installed and be present onsite during the remainder of the forestry keyhole felling works. ➤ Prior to the commencement of works, review and agreement of the positioning by the Operator of the required Aquatic Buffer Zones (ABZs), silt traps, silt fencing (see below), water crossings and onsite storage facilities for fuel, oil and chemicals (see further below). ➤ Be responsible for preparing and delivering the Environmental Tool Box Talk (TBT) to all relevant parties involved in site operations, prior to the commencement of the works. ➤ Take representative photographs showing the progress of operation onsite, and the integrity and effectiveness of the water protection measures. ➤ Collect water samples for analysis by a 3rd party accredited laboratory, adhering to the following requirements: ➤ Surface water samples shall be collected upstream and downstream of the keyhole felling at suitable sampling locations. ➤ Prepare and maintain a contingency plan. ➤ Prepare and maintain a Water Protection Measure Register. This document is to be updated weekly by the ECoW.		
MM11	Drainage Swales	Chapter 4	➤ Drainage swales will be installed in advance of any main construction works commencing. The material excavated to make the swale will be compacted on the downslope edge of the drain to form a diversion dike. ➤ Drainage swales will be installed downgradient of any works areas to collect surface flow runoff where it might have come into contact with exposed surfaces and picked up silt and sediment. ➤ Swales will intercept the potentially silt-laden water from the excavations and construction areas of the site and prevent it reaching natural watercourses.		
MM12	Archaeological Management	Appendix 4-5	Prior to the commencement of construction, a programme of archaeological test trenching will be carried out at greenfield locations of the Site, including the location of the proposed turbine hardstands, proposed temporary construction compounds, proposed borrow pit, along the proposed access tracks and along the underground cabling route. This work will be carried out under licence to the National Monuments Service of the DoHLGH. Dependent on the results		

			of the testing assessment, further mitigation may be required, such as preservation by record or in-situ and/or archaeological monitoring. Any further mitigation will require agreement from the DoHLGH. Where archaeological test trenching is not possible, such as areas dominated by forestry and bog, archaeological monitoring of topsoil stripping will be carried out. This work will be carried out under licence to the National Monuments Service of the DoHLGH. If archaeological remains are identified during the course of these works further mitigation may be required, such as preservation by record or in-situ. Any further mitigation will require agreement from the DoHLGH.		
MM13	Underground Cabling	Appendix 4-5	Before works commence, updated surveying will take place along the proposed cable route, with all existing culverts identified. All relevant bodies i.e. ESB, Mayo County Council, etc. will be contacted and all up to date drawings for all existing services sought.		
MM14	Noise Control	Appendix 4-5	Selection of plant with low inherent potential for generation of noise and/ or vibration where practical		
MM15	Health and Safety Plan	Appendix 4-5	A Health and Safety Plan covering all aspects of the construction process will address the Health and Safety requirements in detail. This will be prepared on a preliminary basis at the procurement stage and developed further at construction stage.		
MM16	Auditing	Appendix 4-5	An Environmental audit will first be carried out prior to the construction phase of the Proposed Project to ensure the implementation of pre-construction mitigation measures, completion of baseline studies and implementation of pre-construction felling mitigation measures.		
MM17	Floating Access Tracks over Peat	Appendix 4-3	Where floating access tracks are proposed, a proposed methodology is presented, however a detailed design will be carried out prior to construction commencing on Site. A confirmatory stability analysis should be carried out by the designer where it is proposed to install floating access tracks over the peat prior to any construction work commencing on Site.		

MM18	Excavation of materials with respect to control of peat stability:	Appendix 4-3	➤ Acrotelm (to about 0.3 to 0.4m of peat) will be required for landscaping and will be stripped and temporarily stockpiled for re-use as required. Acrotelm stripping will be undertaken prior to main excavations. ➤ Where possible, the acrotelm will be placed with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation. ➤ Acrotelm peat (peat below about 0.3 to 0.4 m depth) will be transported immediately on excavation to the designated placement areas or borrow pit areas.		
MM19	Engineering Construction Design	Appendix 4-3	➤ A detailed engineering construction design must be carried out by the appointed construction stage designer prior to any construction work commencing on the Site. This must take account of the consented project details and any conditions imposed by that consent. This must include a detailed peat stability assessment to account for any changes in the environment which may have occurred in the time leading up to the commencement of construction.		
MM20	Site Preparations	Chapter 4	➤ Prior to beginning construction work the contractor will scan the proposed route with a cable avoidance tool (CAT) scanner, carry out visual inspection of the area and may carry out further below ground surveys if deemed necessary. ➤ If any previously unidentified services are discovered by the site engineer, the appropriate crossing methodology will be implemented in consultation with the relevant service provider. ➤ In some instances, it may be necessary to relocate existing underground services such as water mains or existing cables. In advance of any construction activity, the contractor will undertake additional surveys of the proposed route to confirm the presence or otherwise of any previously unidentified services. ➤ As stated above, if previously unidentified services are found, the relevant service provider will be consulted with in order to determine the appropriate crossing methodology. ➤		
MM21	Existing Built Services, eg gas and water mains	Chapter 15	➤ Prior to construction, the Applicant will engage with GNI via the 'Dial Before You Dig' procedure online. GNI will be contacted on 1800 42 77 47 before excavating near the identified medium-pressure pipeline adjacent to the temporary site entrance. Furthermore, the 'Safety advice for working in the vicinity of natural gas pipelines' guidance document		

			and the GNI ‘Code of Practice’ standards will be adhered to during all proposed works in vicinity of gas pipelines. ➤ The Applicant will also carry out further consultation in the pre-construction phase and construction phase with GNI to ensure that no new gas pipelines have been implemented. ➤ In advance of any construction activity, the contractor will undertake pre-commencement surveys to confirm the presence or otherwise of any services such as water supply. If found to be present, the relevant service provider will be consulted with in order to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works. ➤ Scoping consultation with Uisce Eireann identified a water mains that traverses through the Site. If the Proposed Project receives a grant of permission, the Applicant commits to liaise with Uisce Eireann to redirect the pipe, with diversion being done before commencement of construction work to maintain water supply during construction, in accordance with Uisce Eireann. ➤ In the event that any additional water mains are encountered, the water supply will be turned off by the utility so work can commence on diverting the service. The section of existing pipe will be removed and will be replaced with a new pipe along the new alignment of the service. The works will be carried out in accordance with the specifications of the relevant utility provider. ➤		
Construction Phase					
MM22	Refuelling	Chapter 4, 8, 9 Appendix 4-5	➤ Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles. ➤ All plant will be inspected and certified to ensure that they are leak free and in good working order prior to use at the Site. ➤ On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. ➤ Heavy plant and machinery will be refuelled on-site by a fuel truck, with spill kits kept onboard, that will come to the Site as required on a scheduled and organised basis. ➤ Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area in the construction compound when not in use		

			➤ Only designated trained operatives will be authorised to refuel plant on-site; ➤ Refuelling or maintenance of machinery will not occur within the delineated hydrological buffer zones; ➤ Fuels stored on the Site will be minimised; ➤ Any diesel or fuel oils stored at the temporary construction compound will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; and, ➤ An emergency plan for the construction phase to deal with accidental spillages will be identified. Spill kits will be available to deal with accidental spillages. ➤ Mobile bowser, drip kits, qualified personnel will be used where refuelling is required. ➤ The temporary construction compounds on site will include a bunded refuelling and containment area for the storage of lubricants, oils and site generators etc, ➤ Mobile measures such as drip trays and fuel absorbent mats will used during refuelling operations as required. ➤ Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage; ➤ The transformer within the proposed 110kV onsite substation will be bunded appropriately to the volume of oils likely to be stored and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; ➤ The plant used during construction will be regularly inspected for leaks and fitness for purpose.		
MM23	Concrete-Based Products Deliveries and Management	Chapter 4, 9 Appendix 4-5	➤ Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in concrete delivery trucks. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching. ➤ Before leaving the site, washing of the delivery truck will be minimised and restricted to designated wash out areas. Wash out will be restricted to the concrete lorry's chute only. Concrete lorries will be washed out fully at the off-site batching plant, where facilities are already in place. ➤ The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area, or a		

			Siltbuster-type concrete wash unit or equivalent. This type of Siltbuster (or similar) unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids will be removed off-site by an appropriately authorised waste collector for disposal at an authorised waste facility. ➤ Where temporary lined impermeable containment areas are used, such containment areas are typically built using straw bales and lined with an impermeable membrane. ➤ The areas are covered when not in use to prevent rainwater collecting. In periods of dry weather, the areas can be uncovered to allow much of the water to be lost to evaporation. At the end of the concrete pours, any of the remaining liquid contents will be tankered off-site to an appropriately authorised facility as necessary. Any residual solid contents that will have been cleaned down from the chute will have solidified and can be broken up and disposed of along with other construction waste, as noted above, by an appropriately authorised waste collector for disposal at an authorised waste facility. ➤ Alternatively, a Siltbuster-type concrete wash unit or equivalent may be used. This type of Siltbuster unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids can be disposed of off-site at an appropriate waste facility. ➤ Concrete trucks will not be washed out on the site but will be directed back to their batching plant for washout. ➤ Site access tracks will initially be constructed with a subgrade and compacted with the use of a roller to allow concrete delivery trucks access all areas where the concrete will be needed. The final wearing course for the access tracks will not be provided until all turbine foundations have been poured. No concrete will be transported around the Site in open trailers or dumpers so as to avoid spillage while in transport. All concrete used in the construction of turbine foundations will be pumped directly into the shuttered formwork from the delivery truck. If this is not practical, the concrete will be pumped from the delivery truck into a hydraulic concrete pump or into the bucket of an excavator, which will transfer the concrete to the location where it is needed. ➤ The arrangements for concrete deliveries to the Site will be discussed with suppliers before work starts, agreeing routes, prohibiting on-site washout and discussing emergency procedures. ➤ Clearly visible signage will be placed in prominent locations close to concrete pour areas specifically stating washout of concrete lorries is not permitted on the Site.		
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			➤ Due to the volume of concrete required for each turbine foundation, and the requirement for the concrete pours to be continuous, deliveries may be carried out outside normal working hours to limit the traffic impact on other road users, particularly peak period school and work commuter traffic. ➤ ➤ The following mitigation measures are proposed to avoid release of cement leachate from the Site: ➤ No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and, where possible, emplacement of pre-cast elements will take place; ➤ Where possible pre-cast elements for culverts and concrete works will be used; ➤ Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined concrete washout ponds; ➤ Weather forecasting will be used to plan dry days for pouring concrete; and, ➤ The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event; and, ➤ At proposed turbine foundations, sand blinding, DPM, and lean-mix blinding are used to vertically contain the concrete. While the concrete is contained laterally by temporary/permanent shuttering. The concrete cures within 72hrs.		
MM24	Concrete Pouring	Chapter 4, 9 Appendix 4-5	➤ Specific procedures will be adopted in advance of and during all concrete pours to minimise the risk of pollution. These will include: ➤ ➤ Using weather forecasting to assist in planning large concrete pours and avoiding large pours where prolonged periods of heavy rain is forecast. ➤ Restricting concrete pumps and machine buckets from slewing over watercourses while placing concrete. ➤ Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets. ➤ Ensuring that covers are available for freshly placed concrete to avoid the surface washing away in heavy rain.		

			➤ The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area, or a Siltbuster-type concrete wash unit (https://www.siltbuster.co.uk/sb_prod/siltbuster-roadside-concrete-washout-rcw/) or equivalent.		
MM25	Vehicle Washing	Chapter 4	➤ 2 no. wheelwash facilities will be provided at the Site, as indicated on the site layout drawings included as Appendix 4-1. ➤ The first wheel-wash will be placed at the entrance of the Site along the L15053 to facilitate thorough clean down of construction vehicles and machinery before entering and leaving Site to prevent potential spread of invasive species from elsewhere, as well as spread of Japanese knotweed to areas outside of the Site. ➤ A second wheel-wash will be placed approximately 350m north on the L15053 to further reduce risk of spreading Japanese knotweed rhizome to further areas of the Site. ➤ Additionally, Wheels or vehicle underbodies will be washed before leaving the Site to prevent the build-up of mud on public roads. ➤ Internal access tracks will be constructed before other road-going trucks begin to make regular or frequent deliveries to the site (e.g., with steel or concrete). ➤ The contractor will be responsible for ensuring that all vehicles egressing the site have used the wheel wash facilities ➤ A road sweeper will be available if any section of the public roads requires cleaning due to construction traffic associated with the Proposed Project.		
MM26	Wastewater Management	Chapter 4	➤ Temporary port-a-loo toilets and toilets located within a staff portacabin will be used during the construction phase. ➤ Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by a permitted waste collector to wastewater treatment plants. There will also be a water supply on site for hygiene purposes, by way of a temporary storage tank. ➤ The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. ➤ Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007 (as amended), will be employed to transport		

			wastewater away from the substation underground storage tank to a licensed waste water facility.		
MM27	Collector Drains	Chapter 4 Appendix 4-5	> New collector drains and sediment traps will be installed during ground preparation to intercept water upgradient of felling areas and divert it away. Collector drains will be excavated at an acute angle to the contour (0.3%-3% gradient), to minimise flow velocities. > All silt traps will be sited outside of buffer zones and have no direct outflow into the aquatic zone. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of away from all aquatic zones. > All new collector drains will taper out before entering the aquatic buffer zone to ensure the discharging water gently fans out over the buffer zone before entering the aquatic zone.		
MM28	Interceptor Drains	Chapter 4, 9	> Interceptor drains will be installed upgradient of any works areas to collect surface flow runoff and prevent it reaching excavations and construction areas of the site where it might have come into contact with exposed surfaces and collected silt and sediment. The drains will be used to divert upslope runoff around the works area to a location where it can be redistributed over the ground surface as sheet flow. > Where required, interceptor drains will be installed in advance of any construction works commencing.		
MM29	Check Dams	Chapter 4 Appendix 4-5	> The velocity of flow in the interceptor drains will be controlled by check dams, which will be installed at regular intervals along the drains to ensure flow in the channel is non-erosive. On steeper sections where erosion risks are greater, a geotextile membrane will be added to the channel. > Use of existing field drains or track side swales with check dams, and/or filtration check dams will reduce silt in runoff water as required. > Build-up of silt levels at check dams will be removed and disposed of appropriately. Silt levels at check dams will be visually inspected on a daily basis as part of an ongoing drainage maintenance programme during the construction phase. Where check dams become clogged with silt or vegetation, stone check dam to be removed and replaced subsequent to the removal of silt. > Spacing and frequency of check dams / silt traps will be dependent upon longitudinal gradient of swales.		

	Level Spreaders	Chapter 4,9	➤ A level spreader will be constructed at the end of each interceptor drain to convert concentrated flows in the drain, into diffuse sheet flow on areas of vegetated ground. The levels spreaders will be located downgradient of any proposed works areas in locations where they are not likely to contribute further to water ingress to construction areas of the Site. ➤ The level spreaders will distribute clean drainage water onto vegetated areas where the water will not be reconcentrated into a flow channel immediately below the point of discharge. The discharge point will be on level or only very gently sloping ground rather than on a steep slope in order to prevent erosion. ➤ The slope in the channel leading into the spreader will be less than or equal to 1%. The slope downgradient of the spreader onto which the water will dissipate will have a grade of less than 6%. The availability of slopes with a grade of 6% or less will determine the locations of level spreaders. If a slope grade of less than 6% is not available in the immediate area downgradient of a works area at the end of a diversion drain, a piped slope drain (see Section 4.7.4.5 below) will be used to transfer the water to a suitable location.		
MM30	Piped Slope Drains	Chapter 4,9	➤ Piped slope drains will be used to convey surface runoff from diversion drains safely down slopes to flat areas without causing erosion. Once the runoff reaches the flat areas it will be reconverted to diffuse sheet flow.		
MM31	Vegetation Filters	Chapter 4	Vegetation filters will carry outflow from the level spreaders as overland sheet flow, removing any suspended solids and discharging to the groundwater system by diffuse infiltration. Vegetation filters will not be used in isolation for waters that are likely to have higher silt loadings. In such cases, silt-bearing water will already have passed through stilling ponds prior to diffuse discharge to the vegetation filters via a level spreader.		
MM32	Stilling Ponds (Settlement Ponds)	Chapter 4	➤ Stilling ponds will be used to attenuate runoff from works areas of the Proposed Project during the construction phase and will remain in place to handle runoff from access tracks and hardstanding areas of the Proposed Project during the operational phase.		

			➤ The purpose of the stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity. ➤ Reducing runoff velocity will allow larger particles to settle out in the stilling ponds, before the run-off water is redistributed as diffuse sheet flow in filter strips downgradient of any works areas. ➤ The stilling ponds will be sized according to the size of the area they will be receiving water from but will be sufficiently large to accommodate peak flows storm events. ➤ The stilling ponds will be dimensioned so that the length to width ratio will be greater than 2:1, where the length is the distance between the inlet and the outlet. Where ground conditions allow, stilling ponds will be constructed in a wedge shape, with the inlet located at the narrow end of the wedge. Each stilling pond will be a minimum of 1-1.5 metres in depth. ➤ Deeper ponds will be used to minimise the excavation area needed for the required volume. ➤ The embankment that forms the sloped sides of the stilling ponds will be stabilised with vegetated turves, which will have been removed during the excavation of the stilling ponds area. All material excavated during pond construction will be used locally for landscaping and berm construction around these ponds. ➤ Stilling ponds will be located towards the end of swales, close to where the water will be reconverted to diffuse sheet flow. ➤ Upon exiting the stilling pond system, water will be immediately reconverted to diffuse flow via a fan-shaped rock apron if there is adequate space and ground conditions allow. ➤ Otherwise, a swale will be used to carry water exiting the stilling pond system to a level spreader to reconvert the flow to diffuse sheet flow.		
MM33	Silt Bags	Chapter 4	➤ Dewatering silt bags allow the flow of water through them while trapping any silt or sediment suspended in the water. The silt bags provide a passive non-mechanical method of removing any remaining silt contained in the potentially silt-laden water collected from works areas within the Site. ➤ Dewatering silt bags are an additional drainage measure that can be used downgradient of the stilling ponds at the end of the drainage swale channels and will be located, wherever it is deemed appropriate, throughout the Site. The water will flow, via a pipe, from the stilling ponds into the silt bag. The silt bag will allow the water to flow through the		

			geotextile fabric and will trap any of the finer silt and sediment remaining in the water after it has gone through the previous drainage measures. The dewatering silt bags will ensure that there will be no loss of silt into the outflow.		
MM34	Siltbuster	Chapter 4	➤ A “siltbuster” or similar equivalent piece of equipment will be available to filter any water pumped out of excavation areas, if necessary, prior to its discharge to stilling ponds or swales. ➤ Measures employed to prevent overdosing and potential chemical carryover: ➤ The siltbuster system comprises an electronic in-line dosing system which provides an accurate means of adding reagents, so overdosing cannot occur; ➤ Continued monitoring and water analysis of pre and post treated water by means of an inhouse lab and dedicated staff, means the correct amount of chemical is added by the dosing system; ➤ Dosing rates of chemical to initiate settlement is small, being in the order of 2-10 mg/L and the vast majority of the chemical is removed in the deposited sediment; ➤ Final effluent not meeting the discharge criteria is recycled and retreated, which has a secondary positive effect of reducing carryover; and, ➤ Use of biodegradable chemical agents can be used at very sensitive sites (i.e. upstream of SACs).		
MM35	Culvert Crossing	Chapter 4, 9. Appendix 4-5	➤ 1 no. existing culvert crossings will require upgrading as part of the Proposed Project, this being along the upgrade of public road section within the Site. 2 no. new culvert crossings will also be required for the Proposed Project, the first being at the operational site entrance and the second new culvert crossing being along the new access track north of T3. ➤ Culverts will be installed with a minimum internal gradient of 1% (1 in 100). Smaller culverts will have a smooth internal surface. Larger culverts may have corrugated surfaces which will trap silt and contribute to the stream ecosystem. Depending on the management of water on the downstream side of the culvert, large stone may be used to interrupt the flow of water. This will help dissipate its energy and help prevent problems of erosion. Smaller water crossings will simply consist of an appropriately sized pipe buried in the sub-base of the access track at the necessary invert level to ensure ponding or pooling does not occur above or below the culvert and water can continue to flow as necessary.		

			➤ All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance.		
MM36	Silt Fences	Chapter 4 Appendix 4-5	➤ Silt fences will be installed as an additional water protection measure around existing culverts, natural and / or man-made drainage features where required and the proposed locations are indicated on the drainage design drawings. ➤ Silt fences will be installed as single, double or a series of triple silt fences, depending on the space available and the anticipated sediment loading. The silt fence designs follow the technical guidance document '<i>Control of Water Pollution from Linear Construction Projects</i>' published by Construction Industry Research and Information Association (CIRIA, No. C648, 1996). Up to three silt fences may be deployed in series. ➤ All silt fencing will be formed using Terrastop Premium or equivalent silt fence product.		
MM37	Sedimats	Chapter 4	➤ Sediment entrapment mats, consisting of coir or jute matting, will be placed at the outlet of the silt bag to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure.		
MM38	Tree Felling Drainage	Chapter 4, 9	To protect watercourses, the following measures will be adhered to during all keyhole/tree felling activities. ➤ All relevant measures, best practice methods and requirements set out in Chapter 9 of the EIAR will be adhered to including Forestry & Water Quality Guidelines, Forest Harvesting & the Environment Guidelines and the Forest Protection Guidelines. ➤ The extent of all necessary tree felling will be identified and demarcated with markings on the ground in advance of any felling commencing. ➤ All access tracks and culverts will be inspected prior to any machinery being brought on Site to commence the felling operation. No tracking of vehicles through watercourses will occur. Vehicles will only use existing access track infrastructure and established watercourse crossings. ➤ Existing drains that drain an area to be felled towards surface watercourses will be blocked, and temporary silt traps will be constructed to ensure collection of all silt within felling areas. These temporary silt traps will be cleaned out and backfilled once felling works are		

			complete. This ensures there is no residual collected silt remaining in blocked drains after felling works are completed. No direct discharge of such drains to watercourses will occur from within felling areas. ➤ New collector drains and sediment traps will be installed during ground preparation to intercept water upgradient of felling areas and divert it away. Collector drains will be excavated at an acute angle to the contour (0.3%-3% gradient), to minimise flow velocities. ➤ All silt traps will be sited outside of buffer zones and have no direct outflow into the aquatic zone. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of away from all aquatic zones. ➤ All new collector drains will taper out before entering the aquatic buffer zone to ensure the discharging water gently fans out over the buffer zone before entering the aquatic zone. ➤ Machine combinations, such as mechanical harvesters or chainsaw felling will be chosen which are most suitable for ground conditions at the time of felling, and which will minimise soils disturbance. ➤ Mechanised operations will be suspended during and immediately after heavy rainfall. ➤ Where brash is required to form brash mats, it is to be laid out at harvesting stage to prevent soil disturbance by machine movement. ➤ Brash which has not been pushed into the soil may be moved within the Site to facilitate the creation of mats in more demanding locations. ➤ Felling of trees will be pointed directionally away from watercourses. ➤ Felling will be planned to minimise the number of machine passes in any one area. ➤ Extraction routes, and hence brash mats, will be aligned parallel to the ground contours where possible. ➤ Harvested timber will be stacked in dry areas, and outside any watercourse buffer zones. Straw bales and check dams to be emplaced on the down gradient side of timber storage sites. ➤ Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but removing of natural debris deflectors will be avoided.		
MM39	Cable Trench Drainage	Chapter 4	➤ To efficiently control drainage runoff from cable trench works areas, excavated material is stored on the up-gradient side of the trench and is temporarily sealed/smoothed over, using the back of the excavator bucket.		

			➤ Should any rainfall cause runoff from the excavated material, the material is therefore collected and contained in the downgradient cable trench. ➤ Excess subsoil is removed from the cable trench works area immediately upon excavation, and in the case of the Proposed Project, would be transported to one of the on-site designated spoil management areas or used for landscaping and reinstatement of other areas elsewhere on-site.		
MM40	Reactive Site Drainage Management	Chapter 4	➤ The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. ➤ In the event that works are giving rise to siltation of watercourses, the ECoW or supervising hydrologist will stop all works in the immediate area around where the siltation is evident. The source of the siltation will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing.		
MM41	Internal Cabling Trench	Chapter 4 Appendix 4-5	➤ Cable trenches are typically constructed in short, controlled sections, thereby minimising the amount of ground disturbed at any one time and minimising the potential for drainage runoff to pick up silt or suspended solids. Each short section of trench is excavated, ducting installed and bedded, and backfilled with the appropriate materials, before work on the next section commences. This operation normally occurs over a period of 2-4 hours. ➤ To efficiently control drainage runoff from cable trench works areas, excavated material is stored on the up-gradient side of the trench and is temporarily sealed/smoothed over, using the back of the excavator bucket. Should any rainfall cause runoff from the excavated material, the material is therefore collected and contained in the downgradient cable trench. ➤ Excess subsoil is removed from the cable trench works area immediately upon excavation, and in the case of the Proposed Project, would be transported to one of the on-site designated spoil management areas or used for landscaping and reinstatement of other areas elsewhere on-site. ➤ Any underground services encountered along the Proposed Grid Connection will be surveyed for level and the ducting will pass over the service provided adequate cover is available. In order to facilitate the installation of an underground grid connection, it may be necessary to relocate existing underground services such as water mains or existing		

			cables. In advance of any construction activity, the contractor will undertake additional surveys of the proposed route to confirm the presence or otherwise of any services. If found to be present, the relevant service provider will be consulted with in order to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works.		
MM42	Turbine/Met Mast Foundation Excavations	Chapter 4 Appendix 4-5	> > An embankment approximately 600mm high will be constructed around the perimeter of each turbine base and a fence will be erected to prevent construction traffic from driving into the excavated hole and to demarcate the working area. > All necessary health and safety signage will be erected to warn of deep excavations etc. > Access to and from excavated bases will be formed by excavating a pedestrian walkway to 1:12 grade.		
MM43	New Site Access Tracks	Chapter 4 Appendix 4-3	> Interceptor drains will be installed upslope of the access track alignment to divert any surface water away from the construction area. > Excavation of access tracks will be to the level given in the design requirements. Excavation will take place to a competent stratum beneath the peat. > Access track construction will be carried out in sections of approximately 20 m length i.e. no more than 20 m of access track will be excavated without replacement with stone fill. This length will be reduced to 5 m in areas identified within the peat stability risk assessments. > Once excavated, non-castellum peat will be temporarily stored in localised areas adjacent to excavations for access tracks and hardstands before being placed into the permanent peat storage areas within the borrow pits, in the designated peat placement areas, or reused for landscaping purposes. All peat placement areas will be inspected by the Project Geotechnical Engineer before material is located in these. No material is to be sidecast on downslope side of the access track. > Excavation side slopes in peat will be not greater than 1 (V) : 3 (H). This slope inclination will be reviewed during construction, as appropriate. Should areas of weaker peat be encountered then slacker slopes will be required. Battering of the side slopes of the excavation will be carried out as the excavation progresses.		

			➤ End-tipping of stone onto the access track during the construction/upgrading of the access track will be carefully monitored to ensure that excessive impact loading, which may adversely affect the adjacent peat, is limited. ➤ The excavated access track will be constructed with an average of 750 mm of selected granular fill. Granular fill to be placed and compacted in layers in accordance with the TII Specification for Road Works. ➤ Access tracks will be finished with a layer of capping across the full width of the access track. ➤ A layer of geogrid/geotextile may be required at the surface of the competent stratum, where this stratum is cohesive in nature. ➤ Where slopes of greater than 5 degrees are encountered along with relatively deep peat (i.e. greater than 1.5 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, where possible. This method avoids any unnecessary loading of the peat and greatly reduces any risk of peat instability. ➤ Where the above is not possible, a specific Risk Assessment Method Statement (RAMS) from the contractor will be produced, detailing how the downslope works will be undertaken, including that all plant would operate from the already constructed section of access track, with no loading of the peat on the downslope slope and limiting the length of ground to be stripped/excavated at any one time. Movement monitoring posts (as described in the Peat & Spoil Management Plan, Section 9.1) will also be installed downslope of the works area to allow for ongoing monitoring during the construction works. ➤ A final surface layer will be placed over the excavated access track and graded to accommodate wind turbine construction and delivery traffic. ➤ ➤ Mitigation measures for the construction of the proposed new floating access tracks: ➤ ➤ Following the detailed design of the floated access tracks it may be deemed necessary to include pressure berms either side of the access track in some of the deeper peat areas. The inclusion of 2 to 5 m wide pressure berm (typically 0.5 m in height) either side of the access track will reduce the likelihood of potential bearing failures beneath the access road.		
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			➤ The finished access track width will be approximately 5 m, with wider sections on bends and corners. ➤ Stone delivered to the floating access rack construction will be end-tipped onto the constructed floating access track. Direct tipping of stone onto the peat will not be carried out. ➤ To avoid excessive impact loading on the peat due to concentrated end-tipping all stone delivered to the floating access track will be tipped over at least a 10 m length of constructed floating road. ➤ Where it is not possible to end-tip over a 10 m length of constructed floating access track then dumpers delivering stone to the floating access track will carry a reduced stone load (not greater than half full) until such time as end-tipping can be carried out over a 10 m length of constructed floating access track. ➤ Following end-tipping suitable machinery will be employed to spread and place the tipped stone over the base geogrid along the line of the access track. ➤ A final surface layer will be placed over the full width of the floating access track, as per design requirements, to provide a profile and graded to accommodate wind turbine construction and delivery traffic.		
MM44	Upgrading of Existing Access Tracks/ L -15053 Public Road	Chapter 4 Appendix 4-3	➤ For upgrading of all existing access tracks and the L-15053 public road the following guidelines apply: ➤ ➤ Excavation of the access track / public road will take place to a competent stratum beneath the peat, removing all peat and soft clay and backfilled with suitable granular fill. ➤ Benching of the excavation will be required between the existing section of access track and the widened section of the public road where the depth of excavation exceeds 500mm. ➤ For a founded access track, the surface of the existing access track will be overlaid with up to 500mm of selected granular fill. ➤ Access tracks will be finished with a layer of capping across the full width of the road. ➤ A layer of geogrid/geotextile may be required at the surface of the existing public road where the existing road shows signs of rutting, etc.		

			➤ For excavations in peat, side slopes will be not greater than 1 (v): 3 (h). This slope inclination will be reviewed during construction, as appropriate. Where areas of weaker peat are encountered then slacker slopes will be required to ensure stability. ➤ The finished public road width will have a minimum running width of 5m, with wider sections on bends and corners ➤ On side long sloping ground any road widening works required will be done on the upslope side of the existing access road/ tack, where possible		
MM45	Proposed Underground Electrical (33kV) and Communication Cabling	Chapter 4	➤ The top layer of soil (or access track surface) is removed and saved so that it is replaced on completion. ➤ The cables ducting will be bedded with suitable material unless the ground conditions are such that no bedding is required.		
MM46	Proposed 110kV Onsite Substation and Control Buildings	Chapter 4 Appendix 4-2	➤ Perimeter fencing will be erected. ➤ Adequate lighting will be installed around the compound on the lighting masts. ➤ Lightning protection masts of approximate height 18m will be installed to protect the station from direct lightning strikes.		
MM47	Underground Electrical (110kV) Cabling	Chapter 4 Appendix 4-2	➤ Construction methodologies to be implemented and materials to be used will ensure that the UGC is installed in accordance with the requirements and specifications of EirGrid and ESB. The following outlines the methodology to be followed during trenching works: ➤ The Contractor, and their appointed Site Manager, will prepare a targeted Method Statement concisely outlining the construction methodology and incorporating all mitigation and control measures included within the planning application and accompanying reports and as required by planning conditions where relevant; ➤ All existing underground services shall be identified on site prior to the commencement of construction works;		

			➤ Where the cable route intersects with culverts, the culvert will remain in place (where possible) and the ducting will be installed either above or below the culvert to provide minimum separation distances in accordance with ESB and Irish Water specifications; ➤ Excavated material will be temporarily stockpiled onsite for re-use during reinstatement. Stockpiles will be restricted to less than 2m in height. Stockpiles will be located a minimum of 50m from surface water features and all stockpiling locations will be subject to approval by the Site Manager and Project Ecological Clerk of Works (ECoW); ➤ Excavated material shall be employed to backfill the trench where appropriate and surplus material will be transferred to the spoil deposition area; ➤ Any earthen (sod) banks to be excavated will be carefully opened with the surface sods being stored separately and maintained for use during reinstatement; ➤ The excavated trench will be dewatered if required, from a sump installed within the low section of the opened trench. Where dewatering is required, dirty water will be fully and appropriately attenuated, through silt bags, before being appropriately discharged to vegetation or surface water drainage feature; ➤ Where required, grass will be reinstated by either seeding or by replacing with grass turves; ➤ No more than a 100m section of trench will be opened at any one time. The second 100m will only be excavated once the majority of reinstatement has been completed on the first; ➤ The excavation, installation and reinstatement process will take an average of 1 no. day to complete a 100m section;		
MM48	Existing Underground Services	Chapter 4	➤ Any underground services encountered along the Proposed Grid Connection will be surveyed for level and the ducting will pass over the service provided adequate cover is available. ➤ In advance of any construction activity, the contractor will undertake additional surveys of the proposed route to confirm the presence or otherwise of any services. ➤ If found to be present, the relevant service provider will be consulted with in order to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works. ➤ If existing low voltage underground cables are found to be present, a trench will be excavated, and new ducting and cabling will be installed along the new alignment and connected to the network on either end.		

			➤ The trench will be backfilled with suitable material to the required specification. ➤ Warning strip and marking tape will be laid at various depths over the cables as required. ➤ Marker posts and plates will be installed at surface level to identify the new alignment of the underground cable, the underground cables will then be re-energised. ➤ In the event that water mains are encountered the water supply will be turned off by the utility so work can commence on diverting the service. ➤ The section of existing pipe will be removed and will be replaced with a new pipe along the new alignment of the service. ➤ The works will be carried out in accordance with the utility standards.		
MM49	Borrow Pit	Chapter 4 Appendix 4-3	➤ Peat and overburden will be removed and temporarily stored in localised areas adjacent to the borrow pit locations before being placed in the permanent peat/spoil storage areas within the borrow pits. ➤ It is proposed to construct the borrow pit so that the base of the borrow pit is below the level of the adjacent section of access track. ➤ Slopes within the excavated granular material formed around the perimeter of the borrow pit will be formed at stable inclinations to suit local conditions, at an angle of 45 degrees. ➤ The stability of the slopes within the borrow pit will be inspected by the Project Geotechnical Engineer upon excavation to ensure stability during construction works and in the long term. This inspection will allow unfavourable conditions to be identified and suitable mitigation measures to be applied. ➤ It will be necessary to construct a buttress along the perimeter of the borrow pit to maximise the storage capacity. The buttress will be constructed of selected granular fill and placed and compacted in suitable layers to form a buttress of sufficient stability to retain the placed peat and spoil. The founding stratum for the buttress will be inspected and approved by the Project Geotechnical Engineer. ➤ The height of the buttress constructed will be greater than the height of the reinstated peat and spoil to prevent any surface peat and spoil run-off. Buttresses up to 3m in height are likely to be required. ➤ Infilling of the peat and spoil will commence at the back edge of the borrow pit and progress towards the borrow pit entrance/rock buttress, allowing the borrow pit to be developed and infilled in cells. The contractor excavating the rock will be required to		

			develop the borrow pit in a way which will allow the excavated peat and spoil to be reinstated safely. ➤ In order to prevent water retention occurring behind the buttress, the buttress will be constructed of coarse boulder fill with a high permeability. The buttress will be constructed of well graded granular rock fill of about 100mm up to typically 500mm in size. ➤ The use of temporary access ramps and long reach excavators during the placement of the excavated peat and spoil will be required. ➤ The surface of the placed peat and spoil will be shaped following backfill using excavators to allow efficient run-off of surface water from the placed arisings towards the perimeter of the borrow pit. ➤ As the berms are slightly higher than the retained peat and spoil, drains will be provided at regular intervals through the berms, at the same level as the top of the peat surface, to prevent ponding of water around the edges of the repositories. These drains will be 150mm diameter flexible plastic drainage pipe or equivalent. ➤ A layer of geogrid to strengthen the surface of the placed peat and spoil within the borrow pit will be required. ➤ An interceptor drain will also be installed upslope of the borrow pit. This drain will divert any surface water away from the borrow pit and hence prevent water from ponding and lodging during construction and also when reinstated. ➤ Temporary control of groundwater within the borrow pit will be required and exact measures will be determined as part of the confirmatory ground investigation programme. A temporary pump and suitable outfall locations will be required during construction. ➤ A settlement pond will be constructed at the lower side/outfall location of the borrow pit. ➤ The acrotelm will be placed with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the peat and spoil within the borrow pit. ➤ Supervision by the Project Geotechnical Engineer will be carried out for the development of the borrow pit. ➤ All the above-mentioned requirements will be implemented by the Contractor during construction. ➤ Where blasting is used as an extraction method, the blast engineer will arrange for the necessary quantity of explosive to be brought to site to undertake a single blast. The		
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			management of explosives on-site and the actual blasting operation will be agreed in advance with and supervised by An Gardaí Siochána.		
MM50	Peat and Spoil Management	Appendix 4-3 Appendix 4-5 Appendix 8-1	As identified in the Peat and Spoil Management Plan (Appendix 4-3), the following recommendations/best practice guidelines for the placement of peat alongside the proposed infrastructure elements should be considered and taken into account during construction: ➤ Excavated peat/spoil will be placed/spread on the upslope side of sections of access track. Excavated spoil will only be placed in areas where there is no/limited peat (<0.3m), such as around the substation and close to T04, T06 and T07. ➤ The peat placed will be restricted to a maximum height of 1.25m. Any weak/liquified peat must be placed within the proposed borrow pit and not stored within these areas. ➤ The spoil placed will be restricted to a maximum height of 1.5m. ➤ The placement of excavated peat will be avoided without first establishing the adequacy of the ground to support the load. The placement of peat and spoil within the peat and spoil management areas will require the use of long reach excavators, low ground pressure machinery and possibly bog mats, particularly for drainage works. ➤ Where there is any doubt as to the stability of the peat surface, no material will be placed onto the peat surface. The risk of peat instability is reduced by not placing any loading onto the peat surface. ➤ It should be ensured that the surface of the placed peat is shaped to allow efficient run-off of surface water. Shaping of the surface of the peat will be carried out as placement progresses. This will reduce the likelihood of debris run-off and the risk of instability in the placed peat. ➤ Finished/shaped side slopes in the placed peat will be no greater than 1 (vertical) to 4 (horizontal). This slope inclination will be reviewed during construction as appropriate. ➤ The acrotelm will be placed on the finished surface with the vegetation part of the sod facing the correct way up to encourage plant growth on the surface of the placed peat. ➤ Movement monitoring instrumentation will be placed around the areas where peat has been placed. Locations for monitoring will be identified by the Project Geotechnical Engineer on site. ➤ Supervision by the Project Geotechnical Engineer is required for the works.		

			> An interceptor drain will be installed upslope of the designated peat placement areas to divert surface water away. This will help ensure stability of the placed peat and reduce the likelihood of debris run-off. > All of the above commitments will be undertaken by the Contractor during construction.		
MM51	Temporary Construction Compound	Chapter 4 Appendix 4-5	> The area to be used as the compound will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter; > The compound platform will be established using a similar technique as the construction of the substation platform; > A layer of geo-grid will be installed where deemed necessary by the designer and compacted layers of well graded granular material will be spread and lightly compacted to provide a hard area for Site offices and storage containers; > A limited amount of fuel will have to be stored in appropriately bunded containers and a designated area for oil storage will be constructed within the compound. > Areas within the compound will be constructed as access tracks and used as vehicle hardstandings during deliveries and for parking; > A bunded containment area will be provided within the compound for the storage of lubricants, oils and site generators etc; > A waste storage area will be provided within the compound; > The compound will be fenced and secured with locked gates if necessary; and, > Upon completion of the Proposed Project, the temporary construction compounds will be decommissioned and allowed to vegetate naturally.		
MM52	Dust Control	Chapter 6 Chapter 10 Appendix 4-5	> Proposed measures to control dust include: > > Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored to avoid, insofar as reasonably possible, increased runoff. > Vehicle speeds will be controlled when passing over access tracks and hardstanding areas within the Site particularly during extended dry periods.		

			➤ All plant and materials vehicles shall be stored in dedicated areas within the Site. ➤ Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. ➤ Turbines and construction traffic will be transported to the Site on specified haul routes only. ➤ The agreed haul route road adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary. ➤ The roads adjacent to the Site entrances will be checked weekly for damage/potholes and repaired as necessary. ➤ The transportation of materials from the borrow pit around the Site will be covered by tarpaulin or similar covered vehicles where necessary. ➤ The transportation of construction materials from locally sourced quarries to the Site will be covered by tarpaulin where necessary. ➤ If necessary, excavated material will be dampened prior to transport to the spoil management areas. ➤ Approximately 5 dust monitoring gauges will be deployed across the Site to detect any exceedances of acceptable dust levels. ➤ The construction contractor will be required to monitor monthly dust deposition levels each month for the duration of construction phase for comparison with the guideline of 350mg/m²/day(for non-hazardous dusts). This monitoring will be carried out at a series of suitable locations within the Site. Where dust levels are measured to be above this, mitigation measures will be reviewed as part of a dust minimisation plan. ➤ Waste material will be transferred to a licensed/permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Proposed Project to reduce the level of emissions associated with vehicle movement. ➤ The ECoW will regularly monitor adjacent marsh fritillary larval web areas on a daily basis for potential signs of dust deposition or any other habitat degradation. Dust level thresholds and weather will also be monitored in line with all proposed mitigation as set out in above. ➤ If any signs of habitat degradation are noted, the dust-producing works will be immediately halted and further mitigation to protect larval web areas from dust will be implemented in advance of resuming work.		
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			➤ The ECoW will have power to halt construction works if required as outlined above. ➤ Groundworks (i.e., works with potential to create dust) associated with proposed access track to the north of, and within 20m of, the species-rich bog will be fully supervised by an ECoW. ➤ Furthermore, Groundworks (i.e., works with potential to create dust) associated with proposed Turbines 3, 4 and 6, as well as upgrades to the existing tracks to the west of Turbine 3 will be fully supervised by an ECoW to protect marsh fritillary suitable habitats. ➤ The ECoW will perform daily visual site inspections of dust occurrence on the Site during construction, particularly during periods of dry weather and windy conditions. This will be noted as part of site environmental audits. The appointed construction manager for the contractor will be notified if dusty conditions are prevalent on site. ➤		
MM53	Noise Control	Appendix 4-5 Chapter 12	The following best practice mitigation measures from these documents will be implemented as required for the duration of the construction and decommissioning phase; ➤ Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted; ➤ Establishing channels of communication between the contractor/developer, Local Authority and residents; ➤ Appointing a site representative responsible for matters relating to noise and vibration; ➤ Monitoring typical levels of noise and vibration during critical periods and at sensitive locations; ➤ All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract. ➤ Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. ➤ Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use. ➤ Any plant, such as generators or pumps, which is required to operate outside of general construction hours will be surrounded by an acoustic enclosure or portable screen as appropriate.		

			➤ During the course of the construction programme, supervision of the works ensuring compliance with the limits detailed in Table 12-1 of Chapter 12 using methods outlined in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise. ➤ The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs and 19:00hrs Monday to Saturday. However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e. concrete pours, turbine component deliveries) it could occasionally be necessary to work out of these hours. ➤ The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations. ➤ Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use. ➤ Any plant, such as generators or pumps, which is required to operate outside of general construction hours will be surrounded by an acoustic enclosure or portable screen as appropriate. Where potential temporary exceedances are predicted associated with tree felling at the nearest receivers, the following mitigation measures are proposed to reduce noise impacts during the activities: ➤ Orientating plant to minimise the noise impact on nearby receptors where practicable, ➤ Erection of temporary localised mobile noise screens where practicable around activities, ➤ Phasing of work and reduce percentage on time to lower the noise impact. Where rock breaking is employed in relation to the proposed borrow pit location or other locations across the Site, the following are examples of measures that will be employed, where necessary, to mitigate noise emissions from these activities: ➤ Fit suitably designed muffler or sound reduction equipment to the rock breaking tool to reduce noise without impairing machine efficiency. ➤ Ensure all leaks in air lines are sealed. ➤ Use a dampened bit to eliminate ringing.		
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			Air overpressure from a blast is difficult to control, however, because of its variability much can be done to reduce the effect. A reduction in the amount of primer cord used, together with the adequate burial of any that is above the ground, can give dramatic reduction to air overpressure intensities especially in the audible frequency range. Most complaints are likely to be received from an area downwind of the blast site, and therefore, if air blast complaints are a continual problem, it would be advisable to postpone blasting during unfavourable weather conditions if possible. As air blast intensity is a function of total charge weight, then a reduction in the total amount of explosives used can also reduce the air overpressure value. Further guidance will be obtained from the recommendations contained within BS 5228: Part 1 and the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1988 in relation to blasting operations. The methods used to minimise impacts will consist of the following: ➤ Restriction of hours within which blasting can be conducted (e.g. 09:00 – 18:00hrs). ➤ The firing of blasts at similar times to reduce the ‘startle’ effect. ➤ On-going circulars informing people of the progress of the works. ➤ The implementation of an onsite documented complaints procedure. ➤ The use of independent monitoring for verification of results. ➤ Trial blasts in less sensitive areas to assist in blast designs and identify potential zones of influence.		
MM54	Invasive Species Management	Appendix 4-5 Appendix 6-5	The following measures are proposed to establish good site hygiene to ensure the control of any potential spread of invasive species during construction works: ➤ A risk assessment and method statement will be provided by the Contractor prior to commencing works. ➤ Fences will be erected around areas of infestation, as confirmed by test pits, and warning signs shall be erected.		

			➤ A designated wash-down area will be created, where power-washed material from machinery can be contained, collected and disposed of with other contaminated material. This area will contain a washable membrane or hard surface. ➤ Stockpile areas will be chosen to minimise movement of contaminated soil. ➤ Stockpiles will be marked and isolated. ➤ Contaminated areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery. Root barrier membranes will be protected by a layer of sand above and below and topped with a layer of hardcore. ➤ The use of vehicles with caterpillar tracks within contaminated areas will be avoided to minimise the risk of spreading contaminated material. ➤ An ECoW/suitably qualified ecologist will be on site to monitor and oversee the implementation of invasive species management plans. Plant and equipment which is operated within an area for the management of materials in contaminated areas will be decontaminated prior to relocating to a different works area. The decontamination procedures will take account of the following: ➤ Personnel may only clean down if they are familiar with the plant and rhizome material and can readily identify it. ➤ Decontamination will only occur within designated wash-down areas. ➤ Vehicles will be cleaned using stiff-haired brush and pressure washers, paying special attention to any areas that might retain rhizomes e.g. wheel treads and arches. ➤ All run-off will be isolated and treated as contaminated material. This will be disposed of in already contaminated areas.		
MM55	Waste Management	Chapter 4 Appendix 4-5	➤ All hazardous wastes will be stored in bunded containers/areas before being collected by an authorised waste contractor and brought to an EPA licensed waste facility. ➤ Hazardous wastes will be kept separate from non-hazardous wastes so that contamination does not occur. ➤ Appropriate measures will be taken to ensure excess waste is not generated during construction, including: ➤ Ordering of materials will be on an 'as needed' basis to prevent over supply to the Site. Co-ordination is required with suppliers enabling them to take/buy back surplus stock;		

			> Purchase of materials pre-cut to length to avoid excess scrap waste generated on-site; > Request that suppliers use least amount of packaging possible on materials delivered to the Site; > Ensuring correct storage and handling of goods to avoid unnecessary damage that would result in their disposal; > Ensuring correct sequencing of operations; > Use reclaimed materials in the construction works. > All waste generated on site will be contained in waste skips at a waste storage area on site. This waste storage area will be kept tidy with skips clearly labelled to indicate the allowable material to be disposed of therein. > All waste that is produced during the construction phase including dry recyclables will be deposited in the on-site skip initially and sent for subsequent segregation at a remote facility. The anticipated volume of all waste material to be generated at the development is low which provides the justification for adopting this method of waste management. > All employees working on site during the construction phase of the project will be trained in materials management and thereby, should be able to: > Distinguish reusable materials from those suitable for recycling; > Ensure maximum segregation at source; > Co-operate with site manager on the best locations for stockpiling reusable materials; > Separate materials for recovery; and > Identify and liaise with waste contractors and waste facility operators. The fully licensed waste contractor employed to remove waste from the Site will be required to provide documented records for all waste dispatches leaving the Site. Each record will contain the following: > Consignment Reference Number > Material Type(s) and EWC Code(s) > Company Name and Address of Site of Origin > Trade Name and Collection Permit Ref. of Waste Carrier > Trade Name and Licence Ref. of Destination Facility > Date and Time of Waste Dispatch > Registration no. of Waste Carrier vehicle > Weight of Material		
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			➤ Signature of Confirmation of Dispatch detail ➤ Date and Time of Waste Arrival at Destination ➤ Site Address of Destination Facility		
MM56	Toolbox Talks (Health & Safety)	Appendix 4-5	➤ Toolbox talks would be held by the ECoW or Construction Manager at the commencement of each day, or at the commencement of new activities. The toolbox talks will include training and awareness on topics including: ➤ On-site Ecological Sensitivities; ➤ Buffers to be upheld – watercourses, archaeology, ecology; ➤ Sediment and Erosion Control; ➤ Good site practice; ➤ On-site Traffic Routes and Rules; ➤ Keeping to tracks – vehicle rules; ➤ Strictly adhering to the development footprint; ➤ Fuel Storage; ➤ Materials and waste procedures ➤ ➤ Site meetings would be held on a regular basis involving all site personnel. Any non-compliance identified during the previous week would also be discussed with the aim to reduce the potential of the same noncompliance reoccurring. ➤ During construction of the Proposed Project, all staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013'. ➤ This will encompass the use of all necessary Personal Protective Equipment and adherence to Health and Safety Plan.		
MM57	Health and Safety	Appendix 4-5	➤ The suitability of machinery and equipment for use near power lines will be risk assessed. ➤ All staff will be trained on operating voltages of overhead electricity lines running over the Site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the Site will be made aware of the location of overhead electricity lines before they come on to Site. ➤ Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire.		

			➤ When activities must be carried out beneath overhead lines, e.g., component delivery or substation construction, a Site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works. Overhead line proximity detection equipment will be fitted to machinery when such works are required. ➤ Information on safe clearances will be provided to all staff and visitors. ➤ Signage indicating locations and health and safety measures regarding overhead lines ➤ All staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021'. This will encompass the use of all necessary Personal Protective Equipment and adherence to Health and Safety Plan. ➤ ➤ The scale and scope of the project necessitates that a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013'. The PSDP appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to): ➤ ➤ Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the project; ➤ Where possible, eliminate the hazards or reduce the risks; ➤ Communicate necessary control measures, design assumptions or remaining risks to the PSCS so they can be dealt with in the Safety and Health Plan; ➤ Ensure that the work of designers is coordinated to ensure safety; ➤ Organise co-operation between designers; ➤ Prepare a written Safety and Health Plan; ➤ Prepare a safety file for the completed structure and give it to the client; and ➤ Notify the Authority and the client of non-compliance with any written directions issued.		
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			➤ The PSCS appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to): ➤ Development of the Safety and Health Plan for the construction stage with updating where required as work progresses; ➤ Compile and develop safety file information. ➤ Reporting of accidents / incidents; ➤ Weekly Site meeting with PSCS; ➤ Coordinate arrangements for checking the implementation of safe working procedures. Ensure that the following are being carried out: ➤ Induction of all Site staff including any new staff enlisted for the project from time to time; ➤ Toolbox talks as necessary; ➤ Maintenance of a file which lists personnel on Site, their name, nationality, current Safe Pass number, current Construction Skills Certification Scheme (CSCS) card (where relevant) and induction date; ➤ Report on Site activities to include but not limited to information on accidents and incidents, disciplinary action taken and PPE compliance; ➤ Monitor the compliance of contractors and others and take corrective action where necessary; and ➤ Notify the Authority and the client of non-compliance with any written directions issued.		
MM58	Site Evacuation (Health and Safety)	Appendix 4-5	➤ A site evacuation/fire drill procedure will provide basis for carrying out the immediate evacuation of all site personnel in the event of an emergency. The following steps will be taken: ➤ Notification of the emergency situation. Provision of a siren or foghorn to notify all personnel of an emergency situation. ➤ An assembly point will be designated in the construction compound area and will be marked with a sign. All site personnel will assemble at this point. ➤ A roll call will be carried out by the Site Security Officer to account for all personnel on site. ➤ The Site Security Officer will inform the Site Supervisor/Construction Manager when all personnel have been accounted for. The Site Supervisor/Construction Manager will decide		

			the next course of action, which be determined by the situation that exists at that time and will advise all personnel accordingly.		
Operational Phase					
MM59	Wastewater Management	Chapter 4	➤ The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. Full details of the proposed tank alarm system can be submitted to the Planning Authority in advance of any works commencing on-site. The wastewater storage tank alarm will be part of a continuous stream of data from the sites' turbines, wind measurement devices and electricity substation that will be monitored remotely 24 hours a day, 7 days per week. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007 (as amended), will be employed to transport wastewater away from the substation underground storage tank to a licensed waste water facility.		
MM60	Proposed 110kV Onsite Substation and Control Buildings	Chapter 4	➤ Perimeter fencing will be erected.		
ElAR Chapter 5: Population and Human Health					
Pre-construction Phase					
MM66	Human Health	Chapter 5	Prior to commencement of any works, the occupants of dwellings in the vicinity of the proposed works will be contacted and the scheduling of works will be made known. Local access to properties will also be maintained throughout any construction works and local residents will be supplied with the number of the works supervisor in order to ensure that disruption will be kept to a minimum.		
Construction Phase					

MM67	Land Use Patterns and Activities	Chapter 5	There is no potential for impact on residential and commercial land use in the area. The current land use and activities on Site i.e., agricultural and rough grazing practises at the proposed substation and mast locations and along the off-road grid route will be halted during construction, however, once the construction of each element is complete, grazing practises can return in the areas surrounding the infrastructure footprint. The identified 0.7ha of commercial forestry that will be felled for the Proposed Project will be replaced or replanted through proposed enhancement measures or on a hectare for hectare basis as a condition of any felling licence that will be issued in respect of the Proposed Wind Farm felling (see Section 4.4.1.10 of Ch. 4 Description of the Proposed Project of this EIAR).		
MM68	Health and Safety	Chapter 5	The Proposed Project will be constructed in accordance with all relevant Health and Safety Legislation, including: ➤ Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005); ➤ Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2016 (S.I. No. 36 of 2016); ➤ S.I. No. 528/2021 - Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021 and ➤ Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2023. ➤ A Health and Safety Plan covering all aspects of the construction process will address the Health and Safety requirements in detail. This will be prepared on a preliminary basis at the procurement stage and developed further at construction stage. ➤ All hazards will be identified, and risks assessed. Where elimination of the risk is not feasible, appropriate mitigation and/or control measures will be established. The contractor will be obliged under the construction contract and current health and safety legislation to adequately provide for all hazards and risks associated with the construction phase of the project. Safepass registration cards are required for all construction, delivery and security staff. Construction operatives will hold a valid Construction Skills Certificate Scheme card where required. The developer is required to ensure a competent contractor is appointed to carry out the construction works. The contractor will be responsible for the implementation of procedures outlined in the Safety and Health Plan. Public safety will be		

			addressed by restricting Site access during construction. Fencing will be erected in areas of the Site where uncontrolled access is not permitted. ➤ Goal posts will be established, where necessary, under overhead electricity lines for the entirety of the construction phase of the Proposed Wind Farm. ➤ The suitability of machinery and equipment for use near power lines will be risk assessed. ➤ All staff will be trained on operating voltages of overhead electricity lines running the Site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the Site are made aware of the location of lines before they come on to Site. ➤ Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire. ➤ When activities must be carried out beneath overhead lines, e.g., component delivery or substation construction, a Site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works. Overhead line proximity detection equipment will be fitted to machinery when such works are required. ➤ Information on safe clearances will be provided to all staff and visitors. ➤ Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and on Site. ➤ Health and safety measures regarding underground works and overhead lines will be implemented during the construction of the Proposed Grid Connection-connecting the proposed onsite 110kV substation via underground 110kV cabling connecting Castlebar-Cloon 110kV OHL.. ➤ All staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021'⁶. This will encompass the use of all necessary Personal Protective Equipment and adherence to the Site Health and Safety Plan.		
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⁶ Health & Safety Authority (2013) Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013. Available at: https://www.hsa.ie/eng/publications_and_forms/publications/construction/guidelines_on_the_procurement_design_and_management_requirements_of_the_safety_health_and_welfare_at_work_construction_regulations_2013_updated_.pdf

			Proposed Grid Connection specific mitigation measures ➤ Prior to commencing grid connection works in the private agricultural fields in the site there will be goal posts established under the 110k overhead line for the remainder of the grid connection of the construction phase. The goal posts will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks. ➤ The suitability of machinery and equipment for use near power lines will be risk assessed. ➤ All staff will be trained on operating voltages of overhead electricity lines running the Site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the Sites are made aware of the location of lines before they come on to Site. ➤ Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire. ➤ When activities must be carried out beneath overhead lines, e.g., component delivery or substation construction, a Site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works. ➤ Overhead line proximity detection equipment will be fitted to machinery when such works are required. The scale and scope of the Proposed Project necessitates that a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Health & Safety Authority's <i>'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013'</i>. The PSDP appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to): ➤ Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the project; ➤ Where possible, eliminate the hazards or reduce the risks; ➤ Communicate necessary control measures, design assumptions or remaining risks to the PSCS so they can be dealt with in the Safety and Health Plan;		
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			➤ Ensure that the work of designers is coordinated to ensure safety; ➤ Organise co-operation between designers; ➤ Prepare a written Safety and Health Plan; ➤ Prepare a safety file for the completed structure and give it to the client; and ➤ Notify the Authority and the client of non-compliance with any written directions issued. The PSCS appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to): ➤ Development of the Safety and Health Plan for the construction stage with updating where required as work progresses; ➤ Compile and develop safety file information. ➤ Reporting of accidents / incidents; ➤ Weekly Site meeting with PSCS; ➤ Coordinate arrangements for checking the implementation of safe working procedures. Ensure that the following are being carried out: ➤ Induction of all Site staff including any new staff enlisted for the project from time to time; ➤ Toolbox talks as necessary; ➤ Maintenance of a file which lists personnel on Site, their name, nationality, current Safe Pass number, current Construction Skills Certification Scheme (CSCS) card (where relevant) and induction date; ➤ Report on Site activities to include but not limited to information on accidents and incidents, disciplinary action taken and PPE compliance; ➤ Monitor the compliance of contractors and others and take corrective action where necessary; and Notify the Authority and the client of non-compliance with any written directions issued.		
MM69	Water Quality	Chapter 5	➤ A bespoke drainage design which includes but is not limited to interceptor drains, check dams, swales and ponds will be implemented on the Site to reduce risk of water quality impacts on sensitive receptors.		

MM70	Noise and Vibration	Chapter 5	➤ The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations. ➤ All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract. ➤ Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. ➤ Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use. ➤ Any plant, such as generators or pumps, which is required to operate outside of general construction hours will be surrounded by an acoustic enclosure or portable screen as appropriate. During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed in Section 12.6.1.1 of Chapter 12 using methods outlined in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise. ➤ The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs and 19:00hrs Monday to Saturday. However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e. concrete pours, turbine component deliveries) it could occasionally be necessary to work out of these hours.		
MM71	Traffic and Transport	Chapter 5	➤ A Traffic Management Plan (TMP), included as Appendix 15-2 to the EIAR, has also been developed in order to minimise any potential effect on the local population during the construction phase of the Proposed Project due to traffic. The plan will be developed and implemented to ensure any effect is short term in duration and imperceptible in significance during the construction of the Proposed Project. Prior to commencement of any works, the occupants of dwellings in the vicinity of the proposed works will be contacted and the scheduling of works will be made known. Local access to properties will also be maintained throughout any construction works and local residents will be supplied with the number of the works supervisor in order to ensure that disruption will be kept to a minimum.		

MM72	Major Accidents and Natural Disasters	Chapter 5	➤ The Proposed Project will be designed and built in line with current best practice and, as such, mitigation against the risk of major accidents and/or disasters will be embedded through the design. In accordance with the provision of the European Commission 'Guidance on the preparation of Environmental Impact Assessment Reports' 2017, a Risk Management Plan will be prepared and implemented on site to ensure an effective response to disasters or the risk of accidents. The plan will include sufficient preparedness and emergency planning measures. ➤ A Construction and Environmental Management Plan (CEMP) has been prepared for the Proposed Project and is included in Appendix 4-5 of this EIAR. Upon a grant of planning permission for the Proposed Project, the CEMP will be updated to reflect the conditions stipulated in the consent prior to the commencement of the development. The CEMP will be a live document maintained by the contractor that will work to ensure that potential risks of major accident and/or disaster are identified, avoided and mitigated, as necessary. Refer to Appendix 4-5 for the CEMP that sets out the minimum standards to be employed by the contractor. ➤ Potential effects associated with contamination during construction, operation and decommissioning are addressed fully in Chapter 8 Land, Soils and Geology, and Chapter 9 Water. The mitigation measures outlined in Chapter 8 and Chapter 9 to protect environmental receptors as well as the procedures and measures described in the CEMP will ensure that the risk from these sources is low. ➤ The Proposed Project will also be subject to a fire safety risk assessment in accordance with Chapter 19 of the Safety, Health and Welfare at Work Acts 2005 to 2014, which will assist in the identification of any major risks of fire on site, and mitigation of the same during operation.		
Operational Phase					
MM73	Residential Amenity	Chapter 5	➤ All mitigation as outlined under noise and vibration, dust, traffic, visual amenity, shadow flicker, and telecommunications in this EIAR will be implemented in order to reduce insofar as possible impacts on residential amenity at properties located in the vicinity of the		

			Proposed Project works, including along the proposed turbine and construction materials haul route and the Proposed Grid Connection.		
MM74	Health and Safety	Chapter 5	The following mitigation measures will be implemented during the operation of the Proposed Project to ensure that the risks posed to staff and landowners remain imperceptible throughout the operational life of the Proposed Project. ➤ Access to the turbines is through a door at the base of the structure, which will be locked at all times outside maintenance visits. The doors will only be unlocked as required for entry by authorised personnel and will be locked again following their exit. ➤ Staff associated with the Proposed Project will conduct frequent visits, which will include inspections to establish whether any signs have been defaced, removed, faded, or are becoming hidden by vegetation or foliage, with prompt action taken as necessary. ➤ Signs will also be erected at suitable locations across the Site as required for the ease and safety of operation of the wind farm. These signs include: ○ Buried cable route markers at 50m (maximum) intervals and change of cable route direction; ○ Directions to relevant turbines at junctions; ○ “No access to Unauthorised Personnel” at appropriate locations; ○ Speed limits signs at Site entrance and junctions; ○ “Warning these Premises are alarmed” at appropriate locations; ○ “Danger HV” at appropriate locations; ○ “Warning – Keep clear of structures during electrical storms, high winds or ice conditions” at Site entrance; ○ “No unauthorised vehicles beyond this point” at specific Site entrances; and ○ Other operational signage required as per Site-specific hazards. ➤ The proposed onsite 110kV substation, which will be operated by ESBN will be locked and fenced off from public access. The substation will be operational remotely and manually 24 hours per day, 7 days a week. Supervisory operational and monitoring activities will be carried out remotely using a SCADA system, with the aid of computers connected via a telephone modem link. ➤ Periodic service and maintenance work which include some vehicle movement. ➤ For operational and inspection purposes, substation access is required.		

			➤ Servicing of the substation equipment will be carried out in accordance with the manufacturer's specifications, which would be expected to entail the following: ○ Six-month service – three-week visit ○ Annual service – six-week visit ○ Weekly and daily visits as required. An operational phase Health and Safety Plan will be developed to fully address identified Health and Safety issues associated with the operation of the Site. Access for emergency services will be available at all times.		
MM75	Major Accidents and Natural Disasters	Chapter 5	The Proposed Project will be designed and built in line with current best practice and, as such, mitigation against the risk of major accidents and/or disasters will be embedded through the design. In accordance with the provision of the European Commission 'Guidance on the preparation of Environmental Impact Assessment Reports' 2017, a Risk Management Plan will be prepared and implemented on site to ensure an effective response to disasters or the risk of accidents. The plan will include sufficient preparedness and emergency planning measures. The Proposed Project will also be subject to a fire safety risk assessment in accordance with Chapter 19 of the Safety, Health and Welfare at Work Acts 2005 to 2014, which will assist in the identification of any major risks of fire on site, and mitigation of the same during operation.		
MM76	Shadow Flicker	Chapter 5	Mitigation will be required where daily or annual shadow flicker exceedances occur. <u>Wind Turbine Control Measures</u> Shadow flicker control models (SFCMs), consisting of light sensors and specialised software, will be installed on each of the wind turbines. The control system will calculate, in real-time: ➤ Whether shadow flicker has the potential to effect nearby sensitive receptors, based on pre-programmed co-ordinates for the sensitive receptors and turbines; ➤ Wind speed (can affect how fast the turbine will turn and how quickly the flicker will occur); ➤ Wind direction; and		

			➤ The intensity of the sunlight. When the control system detects that the sunlight is strong enough to cast a shadow, and the shadow falls on a sensitive receptor or sensitive receptors, then the turbine will automatically shut down; and will restart when the potential for shadow flicker ceases at the effected sensitive receptors. Such systems are common in many wind farm developments. This method of shadow flicker mitigation has been technically well-proven, and the technology has been well established. Table 5-9 contains all calculated shadow flicker results at each sensitive receptor. The SFCMs will automatically curtail turbine operation during predicted shadow flicker events—based on sun angle, turbine position, and time of day, thereby eliminating shadow flicker at all affected receptors, allowing for a short period of time for the rotor to come to a stop. This proposed method of mitigation will be implemented to mitigate shadow flicker effects at all sensitive receptors within the study area. In the event that complaints of shadow flicker are received by the Applicant / site operator or by Mayo County Council, the Applicant will conduct an investigation, and the complaints frequency, duration and time of complaints will be considered, and the specialist modelling software will be used to confirm the occurrence(s). Should the complaint persist, a shadow flicker survey involving the collection of light data will also be carried out at the sensitive receptor in which the complaint was made. Further refinement of the shadow flicker control system will be conducted to fully mitigate negative shadow flicker occurrence. It is therefore considered that the Proposed Project will comply with the Guidelines (DoEHLG, 2006) and if adopted during the course of the planning process, the same control system can meet the requirements of the Draft Guidelines (DoHPLG, 2019). The Proposed Project is therefore not only compliant under current policy but also future-proofed for alignment with forthcoming regulatory changes.		
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EIAR Chapter 6 Biodiversity					
Pre-construction					
MM78	Potential for Direct Disturbance and Mortality of Aquatic Species	Chapter 6	➤ Prior to the commencement of works at the location of the culvert extension along the proposed Turbine Delivery Route, Section 14 Authorisation from the Inland Fisheries Division of the Department of Environment, Climate and Communications will be obtained. Prior to the pumping out of water from the enclosure, electrofishing will be carried out within the dammed area and any recovered aquatic individuals will be relocated by the ECoW to suitable similar river habitat downstream of the works location, under licence. ➤ Only after electrofishing is complete and any fish species are removed, if present, may the water from within the dammed area begin to be pumped out from within this temporary works area.		
MM79	Potential Effects on Raised bog – Mitigation by Design	Chapter 6	➤ While there will be no loss of remnant uncut raised bog as a result of the Proposed Project, as an additional precautionary measure, the following measures will be implemented during the construction phase: ➤ Prior to the commencement of construction works, temporary fencing will be erected along the western margins of the remnant raised bog adjacent to the existing access track which is proposed for upgrade, as shown in Figure 6-11a-b of Chapter 6 Biodiversity of the EIAR. The erection of this fencing will be overseen by the ECoW. This will act to create an exclusion zone around the works and prevent encroachment onto and loss of any species-rich cutover bog within the 5m buffer zone of the construction footprint. ➤ This fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the ECoW on site.		

MM80	Potential Effects on Cutover bog and Associated Habitats including Transition Mire and Quaking Bog – Direct Habitat Loss	Chapter 6	The proposed infrastructure footprint has been designed to entirely avoid areas of species-rich cutover bog, this area is located within 5m of the construction footprint, and is therefore at risk of additional temporary habitat loss due to realistic tracking of vehicles outside the footprint as drawn. Therefore, in order to prevent this additional loss, the following measures will be implemented during the construction phase: ➤ Prior to the commencement of construction works, temporary fencing will be erected along the northern margin of the species rich cutover bog to the northeast of proposed Turbine 3 as shown in Figure 6 11a-b of Chapter 6 Biodiversity of the EIAR. The erection of this fencing will be overseen by the ECoW. This will act to create an exclusion zone around the works and prevent encroachment onto and loss of any species-rich cutover bog within the 5m buffer zone of the construction footprint. This fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the ECoW on site.		
MM81	Potential Effects on Species-rich Wet Grasslands including Annex I <i>Molinia</i> meadows – Direct Habitat Loss	Chapter 6	While the proposed infrastructure footprint has been designed to entirely avoid areas of Annex I <i>Molinia</i> meadow, some areas of <i>Molinia</i> meadow are located within 5m of the construction footprint and felling areas associated with proposed Turbine 6, and are therefore at risk of additional temporary habitat loss due to realistic tracking of vehicles outside the footprint as drawn. Therefore, in order to prevent this additional loss, the following measures will be implemented during the construction phase: ➤ Prior to the commencement of construction works, temporary fencing will be erected at the locations outlined below. The erection of these fences will be overseen by the ECoW. This will act to create an exclusion zone around the works and prevent encroachment onto and loss of any <i>Molinia</i> meadow within the 5m buffer zone of the construction footprint. These locations are also shown in Figure 6-11a-b of Chapter 6 Biodiversity of the EIAR. ○ Along the margins of the Annex I <i>Molinia</i> meadow south and east of proposed Turbine 4 and its associated hardstand and cabling,		

			continuing both north and south along its margins bordering the proposed peat and spoil management areas ○ Along the margins of the <i>Molinia</i> meadow to the southeast of proposed Turbine 6, where this habitat borders proposed construction works. ○ Along the eastern and western margins of the <i>Molinia</i> meadow located to the north of proposed Turbine 3, where the internal cabling route and upgrades to the existing track are proposed ○ Along the northern margin of the <i>Molinia</i> meadow to the southwest of proposed Turbine 6, where felling will be required. This fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the ECoW on site.		
MM82	Biodiversity Enhancement	Chapter 6	The BMEP and associated planting proposals will be implemented within a planting season during or in advance of phase 1 of construction works in order to minimise the interim time necessary for growth and establishment of new habitat		
MM83	Potential Effects on Scrub – Direct Habitat Loss	Chapter 6	The following mitigation will be implemented to protect approximately 0.2209ha of species rich areas of scrub which are not located within the construction footprint but are located within a 5m buffer: ➤ Prior to the commencement of construction works, temporary fencing will be erected bordering the areas of species-rich scrub which is transitioning to immature woodland at the locations shown in Figure 6-11a-b of Chapter 6 Biodiversity of the EIAR and it will not be permitted for vehicles or machinery to enter this area. While this area of scrub is not located within the construction footprint, it is located within a 5m buffer of the footprint and this measure will serve to prevent loss of or encroachment onto this area of mature scrub. This fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the ECoW on site.		

MM84	Potential Effects on Hedgerows and Treelines – Habitat Loss	Chapter 6	In addition to the above the following mitigation will be implemented to protect 209m of additional treelines which are not located within the construction footprint but are located within a 5m buffer of the construction footprint., specifically, mature treelines in the vicinity of the proposed onsite substation. In order to prevent the additional losses beyond the footprint of the development, in these areas the following mitigations will be in place: ➤ Prior to the commencement of construction works, temporary fencing will be erected along the mature treelines in the vicinity of the substation (refer to Figure 6 11a-b of Chapter 6 Biodiversity of the EIAR to the exact locations). Vehicles or machinery will not be permitted to access the fenced off areas. This will act to create an exclusion zone around the works and prevent loss of or encroachment onto these treelines. This fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the ECoW on site.		
MM85	Potential Effects due to the Spread of Invasive Species – Japanese knotweed	Chapter 6 Appendix 6-5	A pre-commencement invasive species survey will be undertaken by a fully qualified ecologist to determine the current location and extent of Japanese knotweed within and adjacent to the Site and to identify any changes in the extent of the Japanese knotweed infestation since the surveys undertaken to inform the EIAR and NIS for the Proposed Project. Surveys shall be conducted in the summer months (June–July) when stands are most visible. Site Set Up: ➤ No ground works shall take place on site prior to the implementation of the site- specific Invasive Species Management Plan. The ISMP will ensure all measures are taken to avoid the spread of species listed on the First and Third Schedule in the course of works associated with the construction and maintenance of the Proposed Project. ➤ Ensure all visitors to the Site are made aware of the location of the Japanese Knotweed recorded and are familiar with its characteristics and method of reproduction. ➤ Machinery operatives and all staff will be given a Toolbox Talk by the appointed ecologist on Japanese Knotweed and the risks associated with this invasive species prior to any works commencing in any of the knotweed exclusion zones.		

			The measures outlined below shall be implemented prior to the commencement of any site clearance or construction works associated with the Proposed Project in order to prevent the disturbance and spread of Japanese knotweed on Site. These measures will be included in the contractor's method statement. ➤ Only people familiar with, and able to identify Japanese knotweed and Japanese knotweed rhizome will be allowed to work within the 7m buffer zones surrounding visible stands. ➤ All Japanese knotweed stands within and adjacent to the construction footprint along the L15053 road will be clearly marked using temporary fencing to prevent disturbance. The fencing will extend to a 7m buffer zone around the infestation (where this does not overlap with the L15053 road itself) as there is potential for root material to extend up to 7m from the infestation. ➤ All material within the fenced areas will be treated as potentially contaminated. ➤ No unnecessary works will take place within the fenced area. (Necessary works are considered to be those activities associated with Japanese knotweed treatment as well as upgrade works to the L15053 road). ➤ In addition to the above, the stands of Japanese knotweed along the L15054 road will be clearly marked using temporary fencing to prevent disturbance. The fencing will extend to a 7m buffer zone around infestations (where these do not overlap with the L15054 or are present outside the Site). ➤ Clearly defined bio-secure clean-down areas will be designated for machinery and personnel prior to any works within fenced Japanese knotweed areas commencing. These areas will be underlain with an impermeable membrane (e.g. radon barrier) to prevent contamination and will include boot washes and tracking surfaces (e.g., plywood) for machinery exiting potentially contaminated areas. The bio-secure areas will be detailed within the appointed contractor's method statement. ➤ Additionally, boot washes, each equipped with a stiff brush will be installed at the entrance of the contaminated areas along the L15053 road for foot operative use. ➤ A wheel-wash will be placed at the entrance of the Site along the L15053 to facilitate thorough clean down of construction vehicles and machinery before entering and leaving Site to prevent potential spread of invasive species from elsewhere, as well as spread of		
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			Japanese knotweed to areas outside of the Site (see Figure 4-1 of Appendix 6-5) for wheelwash location). ➤ A second wheel-wash will be placed approximately 350m north on the L15053 to further reduce risk of spreading Japanese knotweed rhizome to further areas of the Site (see Figure 4-1 of Appendix 6-5) for second wheelwash location). ➤ Ground protection mats will be used on the L15054 to minimise risk of vehicles spreading rhizome from the Japanese knotweed stands present adjacent to the road. Mats will be deployed on sections of the road which are within 7m of any Japanese knotweed stands and will be sufficiently wide to facilitate any traffic utilising the road. ➤ All measures prescribed in the Japanese knotweed management plan will be incorporated into the contractor's respective method statements for works in proximity to First and Third Schedule invasive species.		
MM86	Potential Effects on Badger – Disturbance/Mortality	Chapter 6	Due to the time that may elapse between the surveys undertaken to inform this assessment and the commencement of construction works, a pre-construction mammal survey of the Proposed Project footprint and adjacent areas will be carried out by a qualified ecologist to determine whether any setts have been established in the intervening period. During this survey, a search for evidence of other protected mammal species will also be undertaken.		
MM87	Potential for Effects on Smooth Newt – Direct Habitat Loss, Disturbance and Mortality	Chapter 6	A Section 23 & 34 licence will be obtained from the NPWS prior to the commencement of construction, due to potential disturbance of smooth newts within the terrestrial habitats within 80m of the breeding site. Prior to the commencement of any construction or vegetation clearance works, a smooth newt fence will be erected to the east of the known breeding habitat at the location of the pond onsite. This fence will be located between the proposed construction footprint of Turbine 5 and the breeding pond, creating a protective barrier and exclusion zone for smooth newt. The fence will extend across the agricultural field from the stone wall and hedgerow to the northwest of the pond, to the hedgerow located to the southeast of the pond (approximately 90m in length). The fence will be located minimum of 5m to the east of the pond in order to retain a vegetated buffer zone along all margins of the pond.		

			The fence will be erected as follows: ➤ Smooth newt fencing material to be erected using wooden poles and secured with nails/staples. ➤ Wooden poles to be erected external of the fence. ➤ Wooden poles to be spaced approx. 1.5 - 3m apart. ➤ Silt fencing material will be used in order to also protect the water quality, and must be adequately dug into the soil to ensure smooth newt cannot escape under the fencing. ➤ Silt fencing material is to be taut to ensure there is no sagging offer opportunity for smooth newt to grasp the material. ➤ Silt fencing is to be tall enough for smooth newt not to climb over (approx. 60cm+) Subsequent to the erection of the smooth newt fence and establishment of an exclusion zone, a pre-commencement survey for smooth newt will be undertaken within the known breeding habitat at the location of the pond onsite (to confirm the presence of breeding newt) and within suitable terrestrial habitat within the construction footprint to an 80m buffer of the pond. Surveys will be undertaken by a suitably qualified Ecologist and during the optimal (breeding) season, as per TII (2008a) guidelines and under licence from the NPWS. During this survey, any individuals or population of these species present in the terrestrial habitats within proposed works footprint (to an 80m buffer of the breeding pond) will then be translocated under a Section 23 & 34 licence from the NPWS to the pond side of the exclusion zone, from which they will not be able to re-enter the works zone. If pitfall traps are used to carry out these translocations, then these will be checked at dawn each morning in order ensure the wellbeing of the newts and prevent predation.		
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MM88	Potential for Effects on Marsh Fritillary – Disturbance/Mortality	Chapter 6	Construction and felling/scrub clearance works will occur in close proximity to identified marsh fritillary-populations at Turbine 3 and its associated hardstand and internal cabling. The following mitigations will be applied at this construction location: ➤ A pre-commencement survey for marsh fritillary larvae will be undertaken at the optimal time of year in advance of construction throughout footprint areas of the Proposed Project. ➤ Prior to the commencement of works, a qualified ecologist will be appointed as the Ecological Clerk of Works (ECoW) for the Proposed Project ➤ If active larval webs are recorded within the construction or felling footprint, these webs will be translocated by the ECoW to adjacent suitable existing foraging habitat outside of the construction footprint. This will be achieved by translocating a sod of earth with entire, intact devils' bit scabious plants upon which the larvae are feeding. ➤ Larval webs and associated food plants will only be translocated by the ECoW to existing breeding areas as shown in Confidential Appendix 6-7 of this EIAR.		
MM89	Potential for Effects on Marsh Fritillary – Direct Habitat Loss	Chapter 6	In addition to the small areas within the proposed infrastructure footprint, some areas of suitable marsh fritillary habitat are located within 5m of the construction footprint, and are therefore at risk of being lost due to realistic tracking of vehicles outside the footprint as drawn. Therefore, in order to prevent this additional loss, the following measures will be implemented during the construction phase: ➤ Prior to the commencement of construction works, temporary fencing will be erected in the locations outlined in Section 6.5.2.1.3 of Chapter 6 Biodiversity of the EIAR in relation to the protection of <i>Molinia</i> meadows, which coincide with several of the areas of marsh fritillary suitable habitat. The erection of these fences will be overseen by the ECoW. This will act to create an exclusion zone around the works and prevent the predicted additional loss of marsh fritillary suitable habitat beyond the construction footprint as drawn (i.e. no additional loss within 5m). In addition, the following area will		

			also be subject to temporary fencing to protect marsh fritillary where suitable habitat occurs outside of <i>Molinia</i> meadows: ○ Around the proposed footprint as drawn surrounding the proposed Turbine 3 and associated cabling route. While there will be some direct loss due to the construction of the proposed infrastructure in this area, this will also act to prevent the predicted additional loss beyond that which is necessary within construction footprint as drawn (i.e. no additional loss within 5m). ○ To the west of the proposed met mast, along the margin of the area of marsh fritillary suitable habitat This fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the ECoW on site.		
Construction Phase					
MM90	Potential for Direct Disturbance and Mortality of Aquatic Species	Chapter 6	➤ The works will be carried out to the specification of the OPW's <i>Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945</i>, and in consultation with Inland Fisheries Ireland; ➤ The works will only be undertaken during low flow conditions and during a dry period between July and September (as required by IFI for in-stream works) to avoid the salmon spawning season and to have more favourable (drier) ground conditions; ➤ During the works, the water will be isolated from the works area (e.g. by over pumping or temporary damming of the channel) to prevent the entrainment of suspended solids; ➤ Sediment and pollution control measures, including silt fencing, will be installed and maintained for the duration of the works; ➤ Pollution prevention measures will be implemented with respect to hydrocarbons (refer to Section 9.5.2.5 of Chapter 9 Water) and cement-based products (Section 9.5.2.6); ➤ Pre-cast concrete units will be utilised; ➤ Water quality will be monitored upstream and downstream of the works to ensure there is no adverse effect. Works will be suspended in the event of any observed impact until corrective measures have been undertaken.		

			➤ All in-stream works will be undertaken in line with Inland Fisheries Ireland (2016) <i>Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters</i> and OPW (2019) <i>Environmental Guidance: Drainage Maintenance and Construction</i>. ➤ All in-stream works will be supervised by an Ecological Clerk of Works (ECoW), who will have the power to halt works if non-compliance is observed. ➤ In order to minimise causing direct physical damage and mortality of species living in the riverbed, the temporary dam will be constructed using sand bags and these will be placed by hand, such that any animals within the vicinity of the footprint will have a chance to leave for alternative suitable areas before potentially harmful effects. ➤ Prior to the commencement of works, Section 14 Authorisation from the Inland Fisheries Division of the Department of Environment, Climate and Communications will be obtained. Prior to the pumping out of water from the enclosure, electrofishing will be carried out within the dammed area and any recovered aquatic individuals will be relocated by the ECoW to suitable similar river habitat downstream of the works location, under licence. ➤ Only after electrofishing is complete and any fish species are removed, if present, may the water from within the dammed area begin to be pumped out from within this temporary works area. ➤ Machinery, construction equipment and construction materials will not enter the water; the works will only occur after the dry working area is created. ➤ All machinery, PPE and equipment used within the watercourse will be thoroughly cleaned and disinfected using a broad-spectrum cleaner (e.g. 1% solution of Virkon Aquatic or another proprietary disinfection product) prior to entering the watercourse and after removal from the watercourse to ensure biosecurity is upheld and limit the spread of invasive species and infectious waterborne diseases. This will occur within a designated wash-down area, which will be underlain by a washable membrane or hard surface.		
MM91	Potential for Aquatic Habitat Degradation –	Chapter 6	➤ All mitigation measures as outlined in Section 9.5 of Chapter 9 Water of the EIAR will be strictly adhered to.		

	Water Quality Deterioration		➤ All works in proximity to watercourses will adhere to Inland Fisheries Ireland (IFI) <i>Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters</i> (2016).		
MM92	Potential Effects on Raised bog – Mitigation by Design	Chapter 6	While there will be no loss of remnant uncut raised bog as a result of the Proposed Project, as an additional precautionary measure, the following measures will be implemented during the construction phase: ➤ Prior to the commencement of construction works, temporary fencing will be erected along the western margins of the remnant raised bog adjacent to the existing access track which is proposed for upgrade, as shown in Figure 6-11a-b of Chapter 6 Biodiversity of the EIAR. The erection of this fencing will be overseen by the ECoW. This will act to create an exclusion zone around the works and prevent encroachment onto and loss of any species-rich cutover bog within the 5m buffer zone of the construction footprint. ➤ This fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the ECoW on site.		
MM93	Potential Effects on Raised bog – Habitat Degradation – Dust Deposition	Chapter 6	A range of construction phase mitigation measures to prevent dust related impacts on the Site in general have been set out in Chapter 10: Air Quality. These include the following and will serve to ensure that there will be no significant effects on raised bog habitat as a result of dust deposition: ➤ Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored by the appointed ECoW to avoid, insofar as reasonably possible, increased runoff. ➤ Vehicle speeds will be controlled when passing over access tracks and hardstanding areas within the Site, particularly during extended dry periods ➤ If necessary, excavated material will be dampened prior to transport to the spoil management areas. ➤ Local roads on approach and within the Site will be regularly inspected for cleanliness and cleaned as necessary.		

			➤ The roads adjacent to the site entrances will be checked weekly for damage/potholes and repaired as necessary. ➤ The transportation of materials from the borrow pit around the Site will be covered by tarpaulin during extended dry periods where necessary. ➤ Construction materials will be sourced from local quarries and will be covered by tarpaulin during extended dry periods where necessary. ➤ A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-5). The CEMP includes dust suppression measures. ➤ The ECoW will perform daily visual site inspections of dust occurrence on the Site during construction, particularly during periods of dry weather and windy conditions. This will be noted as part of site environmental audits. The appointed construction manager for the contractor will be notified if dusty conditions are prevalent on site. The ECoW will have power to halt construction works if required.		
MM94	Potential Effects on Cutover bog and Associated Habitats including Transition Mire and Quaking Bog – Direct Habitat Loss	Chapter 6	While the proposed infrastructure footprint has been designed to entirely avoid areas of species-rich cutover bog, this area is located within 5m of the construction footprint, and is therefore at risk of additional temporary habitat loss due to realistic tracking of vehicles outside the footprint as drawn. Therefore, in order to prevent this additional loss, the following measures will be implemented during the construction phase: ➤ All works in close proximity to identified areas of species-rich cutover bog will be supervised by the ECoW ➤ Prior to the commencement of construction works, temporary fencing will be erected along the northern margin of the species rich cutover bog to the northeast of proposed Turbine 3 as shown in Figure 6 11a-b of Chapter 6 Biodiversity of the EIAR. The erection of this fencing will be overseen by the ECoW. This will act to create an exclusion zone around the works and prevent encroachment onto and loss of any species-rich cutover bog within the 5m buffer zone of the construction footprint. This fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the ECoW on site.		

MM95	Potential Effects on Cutover bog and Associated Habitats including Transition Mire and Quaking Bog – Habitat Degradation – Dust Deposition	Chapter 6	The following mitigation applies to construction areas within 20m of species-rich cutover bog (in line with Table 4 of IAQM Guidance on the Assessment of Dust from Demolition and Construction 2024). No other high-value cutover bog habitats are located within 20m of the construction footprint: ➤ Groundworks (i.e., works with potential to create dust) associated with proposed access track to the north of, and within 20m of, the species-rich bog will be fully supervised by an ECoW. ➤ The ECoW will regularly monitor adjacent species-rich cutover bog on a daily basis for potential signs of dust deposition or any other habitat degradation. Dust level thresholds and weather will also be monitored in line with the mitigations set out in Section 6.5.2.1.1 of Chapter 6 Biodiversity of the EIAR. ➤ If any signs of habitat degradation are noted, the dust-producing works will be immediately halted and further mitigation to protect sensitive habitats from dust will be implemented in advance of resuming work. ➤ The ECoW will have power to halt construction works if required as outlined above. All of the additional dust mitigation measures outlined in Section 6.5.2.1.1 of Chapter 6 Biodiversity of the EIAR will apply, which will serve to protect all cutover bog habitats within the Site from potential impacts resulting from dust deposition.		
MM96	Potential Effects on Species-rich Wet Grasslands including Annex I <i>Molinia</i> meadows – Direct Habitat Loss	Chapter 6	In the north of the Site, bolstering of an existing treeline is proposed to the west of the area of Annex I <i>Molinia</i> meadow to the southwest of the proposed onsite substation. In order to avoid tracking or excessive trampling through the habitat, enhancement works at the treeline will be accessed and conducted from the western side of the treeline, through the improved wet grassland in that area, wherever possible. If required to be accessed from the east, no vehicles or machinery will be permitted to drive through the area of <i>Molinia</i> meadow, with works and transport being undertaken on foot, and with an ECoW present. While the proposed infrastructure footprint has been designed to entirely avoid areas of Annex I <i>Molinia</i> meadow, some areas of <i>Molinia</i> meadow are located within 5m of the construction footprint and felling areas associated with proposed Turbine 6, and are therefore at risk of		

			additional temporary habitat loss due to realistic tracking of vehicles outside the footprint as drawn. Therefore, in order to prevent this additional loss, the following measures will be implemented during the construction phase: ➤ All works in close proximity to <i>Molinia</i> meadows will be supervised by ECoW. ➤ Prior to the commencement of construction works, temporary fencing will be erected at the locations outlined below. The erection of these fences will be overseen by the ECoW. This will act to create an exclusion zone around the works and prevent encroachment onto and loss of any <i>Molinia</i> meadow within the 5m buffer zone of the construction footprint. These locations are also shown in Figure 6-11a-b of Chapter 6 Biodiversity of the EIAR. ○ Along the margins of the Annex I <i>Molinia</i> meadow south and east of proposed Turbine 4 and its associated hardstand and cabling, continuing both north and south along its margins bordering the proposed peat and spoil management areas ○ Along the margins of the <i>Molinia</i> meadow to the southeast of proposed Turbine 6, where this habitat borders proposed construction works. ○ Along the eastern and western margins of the <i>Molinia</i> meadow located to the north of proposed Turbine 3, where the internal cabling route and upgrades to the existing track are proposed ○ Along the northern margin of the <i>Molinia</i> meadow to the southwest of proposed Turbine 6, where felling will be required. This fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the ECoW on site.		
MM97	Potential Effects on Species-rich Wet Grasslands including Annex I <i>Molinia</i> meadows – Habitat	Chapter 6	The following mitigation applies to construction areas within 20m of Annex I <i>Molinia</i> meadows (in line with Table 4 of IAQM Guidance on the Assessment of Dust from Demolition and Construction 2024):		

	Degradation – Dust Deposition		Groundworks (i.e., works with potential to create dust) associated with proposed Turbines 3, 4 and 6, as well as upgrades to the existing tracks to the west of Turbine 3 will be fully supervised by an ECoW. ➤ If any signs of habitat degradation are noted, the dust-producing works will be immediately halted. ➤ The ECoW will have power to halt construction works if required as outlined above. All of the additional dust mitigation measures outlined in Section 6.5.2.1.1 of Chapter 6 Biodiversity of the EIAR will apply.		
MM98	Potential Effects on Scrub – Direct Habitat Loss	Chapter 6	The following mitigation will be implemented to protect approximately 0.2209ha of species rich areas of scrub which are not located within the construction footprint but are located within a 5m buffer: ➤ Prior to the commencement of construction works, temporary fencing will be erected bordering the areas of species-rich scrub which is transitioning to immature woodland at the locations shown in Figure 6-11a-b of Chapter 6 Biodiversity of the EIAR and it will not be permitted for vehicles or machinery to enter this area. While this area of scrub is not located within the construction footprint, it is located within a 5m buffer of the footprint and this measure will serve to prevent loss of or encroachment onto this area of mature scrub. This fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the ECoW on site.		
MM99	Potential Effects on Hedgerows and Treelines – Habitat Loss	Chapter 6	The following mitigation will be implemented to protect 209m of additional treelines which are not located within the construction footprint but are located within a 5m buffer of the construction footprint., specifically, mature treelines in the vicinity of the proposed onsite substation. In order to prevent the additional losses beyond the footprint of the development, in these areas the following mitigations will be in place:		

			➤ Prior to the commencement of construction works, temporary fencing will be erected along the mature treelines in the vicinity of the substation (refer to Figure 6 11a-b of Chapter 6 Biodiversity of the EIAR to the exact locations). Vehicles or machinery will not be permitted to access the fenced off areas. This will act to create an exclusion zone around the works and prevent loss of or encroachment onto these treelines. This fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the ECoW on site.		
MM100	Potential Effects due to the Spread of Invasive Species – Japanese knotweed	Chapter 6 Appendix 6-5	A site-specific Invasive Species Management Plan (ISMP) has been prepared and is presented in Appendix 6-5 of this EIAR. The management plan includes detailed measures for the treatment of Japanese knotweed within and adjacent to the construction footprint, including excavation, chemical treatment and ongoing monitoring over a number of years to monitor for and treat any regrowth. Section 4 of the ISMP (Appendix 6-5 of this EIAR) outlines the necessary management measures for Japanese knotweed under the subheadings of site set-up, excavation of Japanese knotweed adjacent to the L15053, chemical treatment, general biosecurity measures and management and monitoring.		
MM101	Potential Effects on Badger – Disturbance/Mortality	Chapter 6	If any badger setts are identified within the Site during the pre-construction mammal survey, the following measures will be implemented in order to protect the sett: ➤ Any badger setts identified will be afforded protection in line with the requirements set out in the TII (2006) guidance document. An exclusion zone around the identified sett will be maintained for the duration of the construction works. No works will be undertaken within 30m of the sett. ➤ During the breeding season (December to June inclusive) no works will be undertaken within 50m of active setts or pile driving within 150m of active setts. If such works are required, exclusion measures will be put in place (as outlined above) prior to construction in line with TII Guidelines to ensure that the sett is evacuated.		

			➤ To protect individual badgers during the construction phase of the Proposed Project, all open excavations on site will be covered when not in use and backfilled as soon as possible. Excavations will also be covered at night and any deep excavations left open will have appropriate egress ramps in place to allow mammals to safely exit excavations should they fall in. If a newly established and active sett is identified within an area where works could not avoid direct impacts, then the sett will need to be excluded prior to works commencing. This will need to be undertaken in line with current guidelines by an appropriately qualified ECoW in advance of construction works commencing and in consultation with NPWS.		
MM102	Potential Effects on Bats – Loss or Damage to Commuting and Foraging Habitat	Chapter 6	The Proposed Project design has sought to minimise impacts on commuting and foraging habitat through the siting of turbines within predominantly open habitats and the retention of linear features where practicable. Bat buffers will be implemented around turbine locations in accordance with NatureScot (2021), reducing the proximity of turbines to key habitat features. A Biodiversity Management and Enhancement Plan (BMEP) will be implemented, which includes the provision of new linear planting and the reinforcement of existing hedgerows and treelines to enhance habitat connectivity within the Site (refer to Appendix 6-4 of the EIAR for details). These measures will provide additional commuting and foraging habitat for bats and will contribute to a net gain in linear habitat features within the Site. In addition, native broadleaved woodland planting will be undertaken to replace areas of conifer plantation to be removed. Compared to the existing conifer plantation, which is of <i>Low</i> suitability for bats, the proposed native woodland will provide higher quality habitat for foraging over time. Any vegetation affected by turbine delivery accommodation works will be reinstated following completion of construction.		
MM103	Potential Effects on Bats – Disturbance or	Chapter 6	In relation to disturbance or displacement, while no significant effects on bats are anticipated, the following best practice measures will be implemented during the construction phase.		

	Displacement of Individuals or Populations		Standard construction best practice measures will be implemented to minimise disturbance to bats. During the construction phase, plant and equipment will be operated in accordance with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001), and machinery will be switched off when not in use to minimise unnecessary noise. Where lighting is required, directional and low-intensity lighting will be used to minimise light spill onto adjacent habitats. Lighting will be directed away from treelines, hedgerows and other boundary features, and will utilise warm-spectrum sources in accordance with best practice guidance, including the Institute of Lighting Professionals Guidance Note 08/23 and Bat Conservation Ireland (2026). The Proposed Project design has sought to minimise the potential for displacement through the siting of turbines within predominantly open habitats and the retention of key linear features where practicable. A Biodiversity Management and Enhancement Plan (BMEP) will be implemented, which includes the provision of new linear planting and the reinforcement of existing hedgerows and treelines to maintain and enhance habitat connectivity across the Site. In addition, native broadleaved woodland will be established to replace areas of conifer plantation, resulting in improved habitat quality for bats over time. These measures will maintain and enhance commuting routes and foraging opportunities within the Site, reducing the potential for displacement.		
MM104	Potential for Effects on Smooth Newt – Direct Habitat Loss, Disturbance and Mortality	Chapter 6	Following UK Guidance for Great Crested Newt Mitigation Guidelines (English Nature, 2001), survey data indicate that surveys may reveal from around 2% to 30% of the population. Every effort will be made to translocate as many individuals from the area as possible. However, as it is possible that some individuals will remain despite a thorough survey and translocation effort, the following mitigation measures will also be implemented in order to protect any remaining population within the terrestrial habitats:		

			➤ The smooth newt fence will be retained throughout the construction phase of the Proposed Project, and will be checked at regular intervals to ensure that it is working effectively and is free from holes/damage. ➤ Any vegetation removal within 80m of the pond will be supervised by the ECoW, and any suitable smooth newt refuge habitat e.g. wooden logs, stones or dense vegetation will be manually checked by the ECoW for terrestrial smooth newts. ➤ Any smooth newts identified within the works area will be translocated under NPWS licence to the pond side of the exclusion zone. The ECoW will have the power to stop works in order to carry out the translocation. ➤ The removal of the stone wall adjacent to the pond, which provides a potential winter hibernacula habitat, which will be necessary for the construction of the proposed Turbine 5 will not occur during the winter hibernation season (November-February) as individuals should not be disturbed during this sensitive time. If removal during the hibernation season is required, it will be conducted under the supervision of the ECoW. ➤ The removal of hedgerows on the pond side of the smooth newt fence will be required to accommodate the turbine bat buffer associated with the proposed Turbine 5. This will be undertaken by hand, with no machinery tracking through the fenced area. An ECoW will also be present in order to monitor unnecessary losses of the underlying stone walls, which potentially act as winter hibernacula for smooth newts and should be retained where possible. ➤ Deadwood/brash/logs etc from any vegetation clearance (including the above hedgerow removals) in the vicinity will be placed within the fenced area to enhance the habitat for the smooth newt, under supervision by the ECoW. A Section 23 & 34 licence will be obtained from the NPWS prior to the commencement of construction, due to potential disturbance of smooth newts within the terrestrial habitats within 80m of the breeding site. The stone wall which requires removal during construction will be replaced at an alternative location along the existing hedgerow to the southeast of the pond in order to replace suitable winter hibernacula habitat for newts in an accessible area. Deadwood/brash/logs etc. from any		
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			vegetation or hedgerow clearance in the vicinity will be placed within the fenced area to enhance the habitat for smooth newt.		
MM105	Potential for Effects on Marsh Fritillary – Disturbance/Mortality	Chapter 6	➤ ECoW supervision will be required for construction of components near existing breeding areas (such as Turbines 3 and 4). ➤ Where suitable marsh fritillary habitat occurs in close proximity to Proposed Project infrastructure, side casting of material will be to the opposite side of the proposed infrastructure to where the suitable habitat occurs. ➤ No clearance of scrub or conifer plantation within the proposed bat buffer of Turbines 3 or 6 will be carried out until sufficient exclusion zone fencing to a minimum of 5m is in place, or unless under ECoW supervision.		
MM106	Potential for Effects on Marsh Fritillary – Direct Habitat Loss	Chapter 6	In addition to the small areas within the proposed infrastructure footprint, some areas of suitable marsh fritillary habitat are located within 5m of the construction footprint, and are therefore at risk of being lost due to realistic tracking of vehicles outside the footprint as drawn. Therefore, in order to prevent this additional loss, the following measures will be implemented during the construction phase: ➤ Prior to the commencement of construction works, temporary fencing will be erected in the locations outlined in Section 6.5.2.1.3 of Chapter 6 Biodiversity of the EIAR in relation to the protection of <i>Molinia</i> meadows, which coincide with several of the areas of marsh fritillary suitable habitat. The erection of these fences will be overseen by the ECoW. This will act to create an exclusion zone around the works and prevent the predicted additional loss of marsh fritillary suitable habitat beyond the construction footprint as drawn (i.e. no additional loss within 5m). In addition, the following area will also be subject to temporary fencing to protect marsh fritillary where suitable habitat occurs outside of <i>Molinia</i> meadows: ○ Around the proposed footprint as drawn surrounding the proposed Turbine 3 and associated cabling route. While there will be some direct loss due to the construction of the proposed infrastructure in this area, this will also act to prevent the predicted additional loss beyond that which is necessary within construction footprint as drawn (i.e. no additional loss within 5m).		

			○ To the west of the proposed met mast, along the margin of the area of marsh fritillary suitable habitat This fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the ECoW on site.		
MM107	Potential for Effects on Marsh Fritillary – Habitat Degradation – Dust Deposition	Chapter 6	The following mitigation applies to construction areas within 20m of recorded marsh fritillary larval webs (in line with Table 4 of IAQM Guidance on the Assessment of Dust from Demolition and Construction 2024): ➤ Groundworks (i.e., works with potential to create dust) associated with proposed Turbines 3, 4 and 6, as well as upgrades to the existing tracks to the west of Turbine 3 will be fully supervised by an ECoW. ➤ The ECoW will regularly monitor adjacent marsh fritillary larval web areas on a daily basis for potential signs of dust deposition or any other habitat degradation. Dust level thresholds and weather will also be monitored in line with the mitigations set out in Section 6.5.2.1.2 of Chapter 6 Biodiversity of the EIAR. ➤ If any signs of habitat degradation are noted, the dust-producing works will be immediately halted and further mitigation to protect larval web areas from dust will be implemented in advance of resuming work. ➤ The ECoW will have power to halt construction works if required as outlined above. All of the additional dust mitigation measures outlined in Section 6.5.2.1.2 of Chapter 6 Biodiversity of the EIAR will apply.		
Operational Phase					
MM108	Potential for Effects on Bats during Operation	Chapter 6	A range of embedded and site-specific mitigation measures will be implemented to reduce operational collision risk and maintain low operational risk at the Site. These include: ➤ Implementation of bat felling buffers around all turbines in accordance with NatureScot (2021), NIEA (2021) and BCI (2026), such that habitat features used by bats are maintained outside the turbine risk zone;		

			➤ Management of vegetation within turbine buffer zones to prevent the development of features that could function as commuting routes or attractive foraging habitat close to turbines; ➤ Implementation of blade feathering across all turbines during periods below cut-in speed; ➤ Implementation of a targeted curtailment strategy for Leisler's bat during the principal peak activity period (August to September inclusive), operating from sunset to two hours after sunset and from two hours before sunrise to sunrise, when wind speeds are below 6 m/s and temperatures are above 10°C; ➤ Implementation of a sensitive operational lighting strategy, including directional, low-intensity, warm-spectrum lighting, maintenance of dark corridors, and avoidance of light spill onto treelines, hedgerows and other boundary habitats; ➤ Implementation of habitat enhancement measures under the BMEP, including approximately 2.5km of new native linear planting and approximately 3.5ha of native broadleaved woodland, designed to strengthen connectivity and improve habitat quality in areas separated from turbine locations. These measures represent embedded and site-specific operational mitigation and are designed to reduce collision risk and maintain bat activity away from turbine risk zones.		
EIAR Chapter 7 Birds					
Pre-Construction Phase					
MM110	Birds	Chapter 7	➤ Pre-commencement confirmatory surveys will be undertaken within one month prior to the initiation of works at the Proposed Project to identify sensitive sites (e.g. roosts). ➤ A pre-construction bird survey at the Site will be undertaken within 500m of the development footprint and the historical curlew nest area to ensure that any sensitive roost or nest sites in the works area are identified and disturbance if identified is avoided. Further details are provided in Appendix 7-7. ➤ All site staff and subcontractors will be made aware of any restrictions to be imposed by means of a toolbox talk and a map of the 'no-work zone' will be made available to all construction staff. The restricted area(s) will also be marked off using hazard-tape fencing to alert all personnel on site to the suspension of works within that area.		

Construction Phase					
MM111	Birds	Chapter 7 Appendix 4-5	➤ Works will commence outside the bird nesting season (1st of March to 31st of August inclusive). In the event that construction works run into the subsequent breeding season following commencement, confirmatory bird surveys will be carried out to identify breeding sites of species of high conservation concern, as outlined in the Section 7.7.1. ➤ The removal of woody vegetation will be undertaken in full compliance with Section 40 of the Wildlife Act 1976 – 2022. Where sections of woody vegetation are removed for the purposes of the junction and road upgrades, these will be replaced with suitable hedge/tree species which are common in the local context. ➤ During the construction phase, noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be considered in relation to disturbance of birds. All plant and equipment for use will comply with the European Communities (Noise Emission By Equipment For Use Outdoors) Regulations, 2001, as amended (SI 632/2001). Plant machinery will also be turned off when not in use. ➤ An Environmental Clerk of Works and Project Ecologist will be appointed. Duties will include: ○ Organise the undertaking of pre-construction and construction phase confirmatory bird surveys to avoid impacts on birds. ○ Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Site. ○ Oversee management of ornithological issues during the construction period and advise on ornithological issues as they arise. ○ Provide guidance to contractors to ensure legal compliance with respect to protected species onsite. ○ Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress as necessary. ○ If winter roosting or breeding activity of birds of high conservation concern are identified, the roost or nest site (particularly curlew) will be located and no works shall be undertaken within a species-specific disturbance buffer in line with industry best practice (e.g. Goodship and Furness, 2022). No works		

			shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.		
EIAR Chapter 8 Land, Soils and Geology					
Construction Phase					
MM113	Land and Land-Take	Chapter 8 Appendix 4-5	➤ Design and layout optimization and the use of existing access tracks; ➤ Limit permanent footprint of the Proposed Project; ➤ Avoidance of sensitive habitats; ➤ Reinstate temporary working areas; and, ➤ Minimise disturbance.		
MM114	Peat and Subsoil Excavation	Chapter 8 Appendix 4-5	➤ Placement of turbines and associated infrastructure in areas with suitable ground conditions where appropriate (based on detailed site investigation data – the areas of deeper peat have been avoided by the Proposed Project infrastructure); ➤ The peat/soils and subsoils which will be removed during the construction of turbine hardstands will be localised to the turbine locations. The peat/soil/subsoil will be placed/spread locally alongside the excavations, stored within the 10 no. designated peat and spoil management areas or used to reinstate the borrow pit; ➤ Excavated peat/soils/subsoils shall be excavated and stored separately to topsoil; this will prevent mixing of materials and facilitate reuse afterwards; ➤ At the identified peat and spoil management areas, the vegetative topsoil layer will be removed to allow for spoil to be placed and upon reaching the recommended height, the vegetative topsoil layer will be reinstated; ➤ The peat placed within the peat and spoil management areas will be restricted to a maximum height of 1.25m (1.5m for spoil materials). Weak/liquified peat will be stored in the centre of the peat management areas with firmer/drier peat placed around the outside; ➤ The placement of excavated peat will be avoided without first establishing the adequacy of the ground to support the load. The placement of peat and spoil within the peat and spoil		

			management areas will require the use of long reach excavators, low ground pressure machinery and possibly bog mats in particular for drainage works; ➤ It will be ensured that the surface of the placed peat will be shaped to allow efficient run-off of surface water. Shaping of the surface of the peat will be carried out as placement of peat within the peat and spoil management area progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability of the placed peat; ➤ Finished/shaped side slopes in the placed peat will be not greater than 1 (v): 4 (h). This slope inclination will be reviewed during construction, as appropriate. ➤ Where available, the acrotelm will be placed on the finished surface with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the placed peat and spoil within the peat and spoil management areas; ➤ Movement monitoring instrumentation will be placed around the areas where peat has been placed. The locations where monitoring is required will be identified by the Project Geotechnical Engineer on site; ➤ Supervision by the Project Geotechnical Engineer will be carried out for the works; and, ➤ An interceptor drain will be installed upslope of the designated peat and spoil management areas to divert any surface water away from these areas. This will help ensure stability of the placed peat and reduce the likelihood of debris run-off. (interceptor drains will not be required at all areas as the existing drainage network can function as interceptor drains – silt fences will be installed upgradient of the peat and spoil management areas in these locations).		
MM115	Contamination of Soils/Bedrock by Leakages and Spillages of Hydrocarbons	Chapter 8 Appendix 4-5.	➤ Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Where possible, off-site refuelling will occur at a controlled fuelling station; ➤ On-site re-fuelling will be undertaken using a double skinned bowser or a refuelling truck with spill kits kept onboard; ➤ Only designated trained operatives will be authorised to refuel plant on-site; ➤ Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system; ➤ All fuel storage areas will be bunded appropriately for the duration of the construction phase. All bunded areas will be fitted with a storm drainage system and an appropriate oil		

			interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area; ➤ Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage; ➤ The on-site substation will be bunded appropriately to the volume of oils likely to be stored and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; ➤ The plant used during construction will be regularly inspected for leaks and fitness for purpose; ➤ All waste tar material arising from works on hard top roads will be removed off-site and taken to licensed waste facility; and, ➤ An emergency response plan for the construction phase to deal with accidental spillages is contained within the Construction and Environmental Management Plan (which is contained in Appendix 4-5).		
MM116	Erosion of Exposed Subsoils and Peat During Construction of Infrastructure	Chapter 8 Appendix 4-5	➤ Soils/subsoils removed from the turbine locations and associated access tracks will be used for landscaping, placed/spread locally alongside the excavation or will be stored in the designated peat and spoil management areas. ➤ Temporary drainage systems will be put in place to limit runoff impacts during the construction phase as per the drainage drawings included as Appendix 4-4. ➤ In forestry areas, brash mats will be used to support vehicles on soft ground, reducing soil erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when they become heavily used and worn. Provision will be made for brash mats along all off-road routes, to protect the soil from compaction and rutting.		
MM117	Erosion of Exposed Peat, Soils and Subsoils During Tree Felling	Chapter 8 Appendix 4-5.	➤ All proposed felling works will be completed in accordance with the best practice Forest Service regulation, policies and strategic guidance documents as well as Coillte and Department of Agriculture, Food and the Marine (DAFM) guidance documents to ensure that felling results in minimal potential negative effects on the local soil and subsoil environment.		

			➤ Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water runoff; ➤ The harvester and the forwarder are designed specifically for the forest environment and are low ground pressure machines; ➤ All machinery will be operated by suitably qualified personnel; ➤ These machines will traverse the Site along specified routes (referred to as racks); ➤ Brash mats will be 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 can occur; ➤ As felling progresses, the harvester will collect brash produced by the felling and place it in front of the machine before it advances forward along the rack; ➤ The condition of the racks will be continually monitored and fresh brash will be applied when the brash mat becomes heavily used and worn, ensuring that the mat remains effective throughout the operational phase; and, The location of racks will be chosen to avoid wet and potentially sensitive areas.		
MM118	Peat Instability	Chapter 8 Appendix 8-1	The following control measures incorporated into the construction phase of the Proposed Project will ensure the management of the risks for this site: ➤ Appointment of experienced and competent contractors; ➤ The Site will be supervised by experienced and qualified personnel; ➤ Allocate sufficient time for the Proposed Project construction programme (be aware that decreasing the construction time has the potential to increase the risk of initiating a localised peat movement); ➤ Prevent undercutting of slopes and unsupported excavations; ➤ A robust drainage system will be implemented as per the drainage drawings includes as Appendix 4-4; ➤ There will be no placement of loads/overburden on marginal ground; ➤ Implementation of safety buffers around deep peat areas as detailed in the GPSRA (FT, 2026), with a construction buffer zone being proposed in the south east section of the Site (See Drawing P23-270-0600-0002 in Appendix 8-1). Please refer to Appendix 8-1 for details on the safety buffers.		

			➤ Ensure construction method statements are developed and agreed before commencement of construction and are followed by the contractor; and, Revise and amend the Construction Risk Register as construction progresses to ensure that risks are managed and controlled for the duration of the construction phase of the Proposed Project.		
MM119	Proposed Biodiversity Management and Enhancement Plan	Chapter 8 Appendix 6-4.	All proposed habitat management and enhancement works will be in accordance with the best practice Forest Service regulation, policies and strategic guidance documents as well as Coillte, DAFM and NatureScot guidance documents to ensure minimal potential negative effects on the local peat, soil and subsoil environment. Given the nature of the restoration measures the following mitigation measures are proposed: ➤ Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water runoff; ➤ All machinery operators will be experienced; ➤ The Site will be walked before machinery goes into areas proposed for habitat management; ➤ Bog mats will be used where the excavator is required to travel over wet ground; and, ➤ A low ground pressure excavator with wide tracks (1.9m or greater) will be used to reduce compaction of the peat and subsoils.		
Operational Phase					
MM120	Site Vehicle / Plant Use	Chapter 8 Appendix 4-5	➤ Vehicles used during the operational phase will be refuelled off site before entering the Site; ➤ No fuels will be stored on-site during the operational phase; ➤ Spill kits will be available in all site vehicles to deal with an accidental spillage and breakdowns; and, ➤ An emergency plan for the operational phase to deal with accidental spillages and breakdowns will be contained in the CEMP (Appendix 4-5).		

MM121	Use of Oil in Transformers	Chapter 8 Appendix 4-5	➤ All transformers and substation areas will be bunded to 110% of the volume of oil used in each transformer/substation; and, ➤ An emergency plan for the operational phase to deal with accidental spillages will be contained in the CEMP (Appendix 4-5).		
EIAR Chapter 9 Water					
Pre-Construction Phase					
MM123	Temporary Drainage Works	Chapter 9 Appendix 4-5	Prior to the commencement of construction works (new access tracks/hardstand, turbine foundation installs or upgrade of existing L-15053 road) the following key temporary drainage measures will be installed: ➤ All existing land and forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps; ➤ Clean water interceptor drains will be installed upgradient of the works areas; ➤ Check dams/silt fence arrangements (silt traps) will be placed in all existing that have surface water flows; and, ➤ A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse hydrological buffer zones.		
Construction Phase					
MM124	Tree Felling	Chapter 9	<u>Mitigation by Avoidance:</u> There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document “Forestry and Water Quality Guidelines” are shown in Table 9-22 of the EIAR. <u>Mitigation by Design:</u>		

			Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which are set out as follows: ➤ Machine combinations (i.e. handheld or mechanical) will be chosen which are most suitable for ground conditions and which will minimise soils disturbance; ➤ All machinery will be operated by suitably qualified personnel; ➤ Checking and maintenance of access tracks and culverts will be on-going through any felling operation. No tracking of vehicle through watercourses will occur, as vehicles will use access tracks. There are no existing watercourses within the footprint of the Proposed Project. Where possible, existing drains will not be disturbed during felling works; ➤ Machines will traverse the Site along specified off-road routes (referred to as racks); ➤ The location of racks will be chosen to avoid wet and potentially sensitive areas; ➤ Brash mats will be 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 can occur. Brash mat renewal should take place when they become heavily used and worn. Provision should be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall; ➤ Silt fences will be installed at the outfalls of existing drains downstream of felling areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any felling works and will provide surface water settlement for runoff from work areas and will prevent sediment from entering downstream watercourses. ➤ Accumulated sediment will be carefully disposed of at pre-selected spoil repository areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground; ➤ In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed onsite during construction; ➤ Double silt fencing will also be put down slope of felling areas which are located in close proximity to streams and/or relevant watercourses;		
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			➤ Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded; ➤ Timber will be stacked in dry areas, and outside watercourse buffer zones. Check dams and silt traps will be emplaced on the down gradient side of timber storage/processing sites; ➤ Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff; ➤ All refuelling will be completed outside of the designated 50m hydrological buffer zones. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and, ➤ Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors. <u>Silt Traps:</u> Silt traps will be strategically placed down-gradient within forestry drains near streams. The main purpose of the silt traps and drain blocking is to slow water flow, increase residence time, and allow settling of silt in a controlled manner. <u>Pre-emptive Site Drainage Management</u> The works programme for the felling operations will also take account of weather forecasts and predicted rainfall in particular. Operations will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast. <u>Timing of Proposed Project Felling Works:</u> Felling will only be carried out during periods of no or low rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses.		
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			<u>Drain Inspection and Maintenance:</u> The following items will be carried out during pre-felling inspections and after: ➤ Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines; ➤ Inspection of all areas reported as having unusual ground conditions; ➤ Inspection of main drainage ditches and outfalls. During pre-felling inspections the main drainage ditches will be identified. Ideally the pre-felling inspection will be carried out during rainfall; ➤ Following tree felling all main drains will be inspected to ensure that they are functioning; ➤ Extraction tracks within 10m of drains will be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground; ➤ Culverts on drains exiting the Site, if impeded by silt or debris, will be unblocked; and, ➤ All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall. <u>Surface Water Quality Monitoring:</u> Sampling will be completed before, during (if the operation is conducted over a protracted time) and after the felling activity. The ‘before’ sampling will be conducted within 4 weeks of the felling activity commencing, preferably in medium to high water flow conditions. The “during” sampling will be undertaken once a week or after rainfall events. The ‘after’ sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (i.e. where an impact has been shown). Criteria for the selection of water sampling points include the following: ➤ Avoid man-made ditches and drains, or watercourses that do not have year round flows, i.e. avoid ephemeral ditches, drains or watercourses; ➤ Select sampling points upstream and downstream of the forestry activities;		
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			- It is advantageous if the upstream location is outside/above the forest in order to evaluate the impact of land-uses other than forestry; - Downstream locations will be selected: one immediately below the forestry activity, the second at exit from the forest, and the third some distance from the second (this allows demonstration of no impact through dilution effect or contamination by other land-uses where impact increases at third downstream location relative to second downstream location); and, - The above sampling strategy will be undertaken for all on-site sub-catchments streams where tree felling is proposed. Also, daily surface water monitoring forms (for visual inspections and field chemistry measurements) will be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection.		
MM125	Earthworks Resulting in Suspended Solids Entrainment in Surface Waters	Chapter 9 Appendix 4-5	<u>Mitigation by Avoidance:</u> The key mitigation measure during the construction phase is the avoidance of sensitive hydrological features where possible, by application of suitable buffer zones. The design of the Proposed Project and no works are proposed within the 50m hydrological buffer associated with mapped rovers/streams. No works are proposed within the delineated 100m lake buffer (associated with Drumady Lough and Lough Nambrackkeagh) with the exception of some treeline and hedgerow planting/ enhancement and native woodland planting. These works within the lake buffer zones do not pose a significant risk to the hydrological environment. <u>Mitigation by Design:</u> Source controls: - Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sand bags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems.		

			➤ Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas. ➤ In-Line controls: ➤ Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, straw bales, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems. ➤ Treatment systems: ➤ Temporary sumps and ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems. It should be noted for this site that an extensive network of forestry and trackside drains already exists, and these will be integrated and enhanced as required and used within the wind farm development drainage system. The main elements of interaction with existing drains will be as follows: ➤ Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the proposed wind farm drainage into the existing site drainage network. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion; ➤ Silt traps will be placed in the existing drains upstream of any streams where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area; ➤ Runoff from individual turbine hardstanding areas will not be discharged into the existing drain network but discharged locally at each turbine location through settlement ponds and buffered outfalls onto vegetated surfaces; ➤ Buffered outfalls which will be numerous over the site will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the site; and,		
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			➤ Drains running parallel to the existing access tracks requiring widening will be upgraded, widening will be targeted to the opposite side of the access tracks. Velocity and silt control measures such as check dams, sand bags, oyster bags, straw bales, flow limiters, weirs, baffles, silt fences will be used during the upgrade construction works. Regular buffered outfalls will also be added to these drains to protect downstream surface waters. <u>Pre-commencement Temporary Drainage Works</u> Prior to the commencement of access track upgrades (or new access tracks/hardstand or turbine base installs) the following key temporary drainage measures will be installed: ➤ All existing dry forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps; ➤ Clean water interceptor drains will be installed upgradient of the works areas; ➤ Check dams/silt fence arrangements (silt traps) will be placed in all existing forestry drains that have surface water flows and also along existing forestry trackside drains; and, ➤ A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone. <u>Silt Fences:</u> Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids such as those present in the subsoils/sandstone tills that overlie the site. This will act to prevent entry to watercourses of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water runoff. Inspection and maintenance of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. Double silt fences will be placed within any drains down-gradient of all work areas, where required, inside the 100m lake buffer zones. <u>Silt Bags:</u>		
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			Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, the majority of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters or sedimats. Sediment entrapment mats, consisting of coir or jute matting, will be placed at the silt bag location to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure. <u>Settlement Ponds:</u> The Proposed Project footprint has been divided into drainage catchments (based on topography, outfall locations, catchment size) and stormwater runoff rates based on the 10-year return period rainfall event were calculated for each catchment. These flows were then used to design settlement ponds for each drainage catchment. The settlement ponds are designed for 11hr or 24hr retention times used to settle out medium silt (0.006mm) and fine silt (0.004mm) respectively (EPA, 2006) . Settlement ponds at the borrow pit are designed to allow 24hr retention and settlement ponds along access tracks and at turbine hardstands will have 11hr retention as there are additional in-line drainage controls proposed along access tracks and at hardstands. <u>Level Spreaders and Vegetation Filters:</u> The purpose of level spreaders is to release treated drainage flow in a diffuse manner, and to prevent the concentration of flows at any one location thereby avoiding erosion. Level spreaders are not intended to be a primary treatment component for development surface water runoff. They are a secondary measure that manage how water is released from the drainage system and designed to reduce the impact of the already-controlled flow of treated water. They are not stand alone but occur as part of a treatment train of systems that will reduce the velocity of runoff prior to be released at the level spreader. In the absence of level spreaders, the potential for ground erosion is significantly greater than not using them.		
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			Vegetation filters are essentially end-of-line polishing filters that are located at the end of the treatment train. In fact, vegetation filters are ultimately a positive consequence of not discharging directly into watercourses which is one of the mitigation components of the drainage philosophy. This makes use of the natural vegetation of the Site to provide a polishing filter for the wind farm drainage prior to reaching the downstream watercourses. Again, vegetation filters are not intended to be a single or primary treatment component for treatment of works area runoff. They are not stand alone but are intended as part of a treatment train of water quality improvement/control systems (i.e. source controls, check dams, silt traps settlement ponds level spreaders silt fences vegetation filters). <u>Water Treatment Train:</u> A final line of defence will be provided by a water treatment train such as a “Siltbuster”. If the discharge water from construction areas fails to be of a high quality during regular inspections, then a filtration treatment system (such as a ‘Siltbuster’ or similar equivalent treatment train (sequence of water treatment processes) will be used to filter and treat all surface discharge water collected in the dirty water drainage system. This will apply for all of the construction phase. <u>Pre-emptive Site Drainage Management</u> The works programme for the entire construction stage of the development will also take account of weather forecasts, and predicted rainfall in particular. Large excavations and movements of soil/subsoil or vegetation stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast. The following forecasting systems are available and will be used on a daily basis at the site to direct proposed construction activities:		
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			➤ General Forecasts: Available on a national, regional and county level from the Met Eireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates; ➤ MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale; ➤ 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events; ➤ Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and, ➤ Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest. Using the safe threshold rainfall values will allow work to be safely controlled (from a water quality perspective) in the event of forecasting of an impending high rainfall intensity event. Works will be suspended if forecasting suggests either of the following is likely to occur: ➤ >10 mm/hr (i.e. high intensity local rainfall events); ➤ >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, ➤ >half monthly average rainfall in any 7 days. Prior to works being suspended the following control measures will be completed: ➤ All active excavations will be secured and sealed off; ➤ Temporary or emergency drainage will be installed to prevent back-up of surface runoff; and,		
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			➤ No works will be completed during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded. <u>Management of Runoff from the Peat and Spoil Management Areas:</u> It is proposed that excavated peat/subsoil (spoil) will be used to reinstate the proposed borrow pit, for landscaping throughout the Site and any excess spoil will be placed in the 10 no. peat and spoil management areas. All peat and spoil management areas are located outside the 50m stream/river buffer zone, with all peat and spoil management areas being located a minimum of 500m away from EPA mapped watercourses. The closest is located ~540m northwest of the Meander River as it outflows from Lough Nambrackkeagh. Furthermore, no peat and spoil management areas are located within the delineated 100m lake buffer. The closest is ~230m to the west of Drumady Lough. Proposed surface water quality protection measures regarding the peat and spoil management areas are as follows: ➤ Where applicable the vegetative topsoil layer of the peat and spoil management areas will be rolled back to facilitate placement of excavated spoil up to a maximum height of 1.2 to 1.5 metres, following which the vegetative-top soils layer will be reinstated; ➤ Where reinstatement is not possible, peat and spoil management areas will be sealed with a digger bucket and seeded as soon as possible to reduce sediment entrainment in runoff; ➤ An interceptor drain will be installed upslope of the identified peat and spoil management areas to divert any surface water away from these areas where necessary; ➤ Silt fences and double silt-fences will be emplaced down-gradient of the designated peat and spoil management areas and will remain in place throughout the entire construction phase, or until reseeded has been established to a sufficient level; ➤ Once the peat and spoil management area has been seeded and vegetation is established the risk to downstream surface water is significantly reduced. ➤ Therefore, at each stage of the peat management development the above mitigation measures will be deployed to ensure protection of downstream water quality.		
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			The peat and spoil management area settlement ponds have been designed to allow a 24hr retention time as per EPA guidance (2006) which is highest level of protection recommended by the EPA with regard to retention time. <u>Timing of Site Construction Works:</u> Construction of the site drainage system will only be carried out during periods of low rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works. <u>Monitoring:</u> An inspection and maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended. Inspections will also be undertaken after tree felling. Any excess build-up of silt levels at dams, the settlement pond, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed. Checks will be carried out on a daily basis. During the construction phase field testing and laboratory analysis of a range of parameters with relevant regulatory limits and EQSs will be undertaken for each primary watercourse, and specifically following heavy rainfall events (as per the CEMP included in Appendix 4-5 of this EIAR). <u>Allowance for Climate Change</u>		
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			Climate Change rainfall projections are typically for a mid-century (2050) timeline. The projected effects of climate change on rainfall are therefore modelled towards the end of the life cycle of the proposed development, as the turbines have a life span of 35 years. It is likely that the long-term effects of climate change on rainfall patterns will not be observed during the lifetime of the proposed wind farm. We have designed settlement ponds for a 1 in 10-year return flow. This approach is conservative given that the project will likely be built over a much shorter period (12-18 months), and therefore this in-built redundancy in the drainage design more than accounts for any potential short term climate change rainfall effects. ➤ However, the settlement ponds are designed for 1 in 10 years flows with built in redundancy (+20%) to account for climate change effects on rainfall.		
MM126	Surface Water Quality from Excavation Dewatering	Chapter 9 Appendix 4-5	Management of groundwater seepages and subsequent treatment prior to discharge into the drainage network will be undertaken as follows: ➤ Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations will be put in place; ➤ If required, pumping of excavation inflows will prevent build-up of water in the excavation; ➤ The interceptor drainage will be discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters; ➤ The pumped water volumes will be discharged via volume and sediment attenuation ponds adjacent to excavation areas, or via specialist treatment systems such as a Siltbuster unit; ➤ The borrow pit settlement ponds have been designed to allow a 24hr retention time as per EPA guidance (2006) which is highest level of protection recommended by the EPA with regard to retention time; ➤ There will be no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination will occur; ➤ Daily monitoring of excavations by the Environmental Clerk of Works will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped and a geotechnical assessment undertaken; and,		

			➤ A mobile ‘Siltbuster’ or similar equivalent specialist treatment system will be available on-site for emergencies in order to treat sediment polluted waters from settlement ponds or excavations should they occur. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. The mobile units are specifically designed for use on construction-sites. They will be used as final line of defence if needed.		
MM127	Groundwater Levels During Excavation Works	Chapter 9 Appendix 4-5	Relevant environmental management guidelines from the EPA quarry 2006 guidance document – “Environmental Management in the Extractive Industry” in relation to groundwater issues will be implemented during the construction phase. Control of groundwater within the borrow pit may be required and measures will be determined as part of the ground investigation program. The site investigations indicate that the volumes of water requiring treatment will not be significant.		
MM128	Leakages or Spillages of Hydrocarbons	Chapter 9 Appendix 4-5	Mitigation measures proposed to avoid release of hydrocarbons are as follows: ➤ Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles. ➤ All plant will be inspected and certified to ensure that they are leak free and in good working order prior to use at the Site. ➤ On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. ➤ Heavy plant and machinery will be refuelled on-site by a fuel truck, with spill kits kept onboard, that will come to the Site as required on a scheduled and organised basis. ➤ Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area in the construction compound when not in use ➤ Only designated trained operatives will be authorised to refuel plant on-site; ➤ Refuelling or maintenance of machinery will not occur within the delineated hydrological buffer zones; ➤ Fuels stored on the Site will be minimised; ➤ Any diesel or fuel oils stored at the temporary construction compound will be banded. The bund capacity will be sufficient to contain 110% of the storage tank’s maximum capacity; and,		

			➤ An emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction and Environmental Management Plan (Appendix 4-5). Spill kits will be available to deal with accidental spillages.		
MM128	Release of Cement-Based Products	Chapter 9 Appendix 4-5	➤ No batching of wet-concrete products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place; ➤ Where possible pre-cast elements for culverts and concrete works will be used; ➤ Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined concrete washout ponds; ➤ Weather forecasting will be used to plan dry days for pouring concrete; and, ➤ The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event; and, ➤ At proposed turbine foundations, sand blinding, DPM, and lean-mix blinding are used to vertically contain the concrete. While the concrete is contained laterally by temporary/permanent shuttering. The concrete cures within 72hrs.		
MM129	Wastewater	Chapter 9 Appendix 4-5	➤ During the construction phase, a self-contained port-a-loo with an integrated waste holding tank will be used at each of the site construction compounds, maintained by the providing contractor, and removed from site on completion of the construction works; ➤ Water supply for the site office and other sanitation will be brought to site and removed after use from the site to be discharged at a suitable off-site treatment location; and, ➤ No water or wastewater will be sourced on the site, nor discharged to the Site.		
MM130	Morphological Changes to Surface Watercourses & Drainage Patterns within the Site	Chapter 9 Appendix 4-5	In relation to the new proposed culverts and proposed culvert upgrades at field drain crossings, the culverts will be suitably sized for the expected peak flows in the relevant drain. All culverts will be installed with a minimum internal gradient of 1% (1 in 100). Smaller culverts will have a smooth internal surface. Larger culverts may have corrugated surfaces which will trap silt and contribute to the stream ecosystem. Depending on the management of water on the downstream side of the culvert, large stone may be used to interrupt the flow of water. This will help dissipate its energy and help prevent problems of erosion. Smaller drain crossings will simply consist of an appropriately sized pipe buried in the sub-base of the access track at the		

			necessary invert level to ensure ponding or pooling does not occur above or below the culvert and water can continue to flow as necessary.		
MM131	Use of Siltbuster	Chapter 9 Appendix 4-5	Measures employed to prevent overdosing and potential chemical carryover: ➤ The siltbuster system comprises an electronic in-line dosing system which provides an accurate means of adding reagents, so overdosing cannot occur; ➤ Continued monitoring and water analysis of pre and post treated water by means of an inhouse lab and dedicated staff, means the correct amount of chemical is added by the dosing system; ➤ Dosing rates of chemical to initiate settlement is small, being in the order of 2-10 mg/L and the vast majority of the chemical is removed in the deposited sediment; ➤ Final effluent not meeting the discharge criteria is recycled and retreated, which has a secondary positive effect of reducing carryover; and, ➤ Use of biodegradable chemical agents can be used at very sensitive sites.		
MM132	Local Private Groundwater Well Supplies	Chapter 9 Appendix 4-5	No specific mitigation measures are required with respect to potential quantitative effects due to the local hydrogeological regime, the shallow nature of the Proposed Project and the separation distance between sensitive receptors and Proposed Project infrastructure. Tried and tested, best practice mitigation measures for the protection of local groundwater quality have been proposed above with respect to suspended solids, hydrocarbons, cement-based products and wastewater.		
MM133	Public and Group Groundwater Supplies	Chapter 9 Appendix 4-5	There will be no effects due to the local hydrogeological regime, the shallow nature of the Proposed Project and the separation distance between sensitive receptors and Proposed Project infrastructure. Tried and tested, best practice mitigation measures for the protection of local groundwater quality have been proposed above with respect to suspended solids, hydrocarbons, cement-based products and wastewater.		

MM134	Surface Water Drinking Supplies	Chapter 9 Appendix 4-5	Tried and tested, best practice mitigation measures for the protection of local surface water quality have been proposed above with respect to suspended solids, hydrocarbons cement-based products and wastewater.		
MM135	TDR Works	Chapter 9 Appendix 4-5	“Pre-commencement Temporary Drainage Works” described in will be employed at all the TDR works areas.		
MM136	Biodiversity Management	Chapter 9 Appendix 4-5	All proposed habitat management and enhancement works will be in accordance with the best practice Forest Service regulation, policies and strategic guidance documents as well as Coillte, DAFM and NatureScot guidance documents to ensure minimal potential negative effects on the local peat, soil and subsoil environment. Given the nature of the restoration measures the following mitigation measures are proposed: ➤ Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water runoff; ➤ Proposed off-access track routes will be walked in advance of any machinery; ➤ All machinery operators will be experienced; ➤ The Site will be walked before a machine goes off-access tracks; ➤ Bog mats will be used where the excavator is required to travel over wet ground; and, ➤ A low ground pressure excavator with wide tracks (1.9m or greater) will be used to reduce compaction of the peat and subsoils.		
Operational Phase					
MM137	Replacement of Natural Surface with Lower	Chapter 9 Appendix 4-5	The operational phase drainage system of the Site will be installed and constructed in conjunction with the track and hardstanding construction work as described below and as shown on the Drainage drawings submitted with this planning application (Appendix 4-4):		

	Permeability Surfaces		➤ Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader; ➤ Swales/track side drains will be used to collect runoff from access tracks and turbine hardstanding areas of the site, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling; ➤ On steep sections of access track transverse drains ('grips') will be constructed in the surface layer of the track to divert any runoff off the track into swales/track side drains; ➤ Check dams will be used along sections of access track drains to intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock; ➤ Settlement ponds, emplaced downstream of track swale sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses; and, ➤ Settlement ponds have been designed in consideration of the greenfield runoff rate. As described above the proposed integration of the Proposed Project site drainage with the existing forestry drainage is a key component of the proposed drainage management within the Site. By integration we mean maintaining surface water flowpaths where they already exist, avoid creation of new or altered surface water flowpaths, and maintaining the drainage regime (i.e. normal flow) within each forestry compartment. Critically, there will be no alteration of the catchment size contributing to each of the main downstream watercourses. All wind farm drainage water captured within individual site sub-catchments will be attenuated and released within the same sub-catchments that it was captured.		
MM138	Runoff Resulting in Contamination of Surface Waters	Chapter 9 Appendix 4-5	Mitigation measures for sediment control are the same as those detailed for the construction phase. With regards to hydrocarbons:		

			➤ Onsite re-fuelling of normal operational vehicles will not be carried out during the operational phase of the Proposed Project. These vehicles will be refuelled offsite; ➤ Fuels stored on site will be minimised and any hydrocarbons stored on-site will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; ➤ The substation will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage of any associated chemicals and to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; ➤ Oil in the turbine transformers will be fully bunded within the enclosed turbine and as such, there is no potential pathway to the water environment i.e. the pathway has been blocked; ➤ Spill kits will be available to deal with accidental spillages.		
MM139	Water Supply at Substation	Chapter 9 Appendix 4-5	The abstraction rate for the proposed groundwater well at the substation will be comparable to a domestic well, with a well supplying a single household typically abstracting less than 1m ³ /day. Due to the proposed extraction rate, no effects on local groundwater levels will occur. For these reasons no mitigation measures are required.		
ElAR Chapter 10 Air Quality					
Construction Phase					
MM141		Chapter 10	➤ Proposed Project construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required. ➤ All plant and materials shall be stored in dedicated areas (onsite). Machinery will be switched off when not in use. ➤ Turbines and construction materials will be transported to the site on specified routes only, unless otherwise agreed with the Planning Authority. Please see Chapter 15 Material Assets for details.		

			➤ Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas to reduce the amount of vehicles where possible. ➤ The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Site. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor local to the Site to reduce the emissions associated with vehicle movements. ➤ Regular maintenance of plant and equipment will be undertaken. Periodic technical inspection of vehicles will be carried to ensure they perform most efficiently; ➤ Implementation of a Traffic Management Plan (Chapter 15, Appendix 15-2) to minimise vehicle congestion; ➤ No idling of engines will be permitted, all site vehicles and machinery will be switched off when not in use ➤ The majority of aggregate materials for the construction of the Proposed Projectcumulativ will be obtained from the on-site borrow pit. This will reduce the number of delivery vehicles to site, thereby reducing emissions associated with vehicle movements. ➤ Any additional aggregate materials required for the construction of the Proposed Project will be sourced from local quarries. ➤ A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-5).		
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MM142	Exhaust Emissions: Transportation to and from the Site	Chapter 10	➤ Aggregate materials for the construction of Site access tracks and all associated infrastructure will all be locally sourced where possible, which will further reduce potential emissions. ➤ Turbines and construction materials will be transported to the Site on specified haul routes only. ➤ The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Proposed Project site. Therefore, all wastes streams generated onsite will be deposited into a single waste skip which will be covered. Waste material will be transferred to a licensed /permitted MRF by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. ➤ The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements. ➤ A CEMP will be in place throughout the construction phase (see Appendix 4-5).		

MM143	Dust Emissions: Construction of Proposed Project Infrastructure	Chapter 10	➤ Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored by the Ecological Clerk of Works (ECoW) to avoid, insofar as reasonably possible, increased runoff. ➤ Vehicle speeds will be controlled when passing over access tracks and hardstanding areas within the Site particularly during extended dry periods. ➤ If necessary, excavated material will be dampened prior to transport to the spoil management areas. ➤ Local roads on approach and within the Site will be regularly inspected for cleanliness and cleaned as necessary. ➤ The transportation of materials from the borrow pit around the Site will be covered by tarpaulin during extended dry periods where necessary. ➤ Construction materials will be sourced from local quarries and will be covered by tarpaulin during extended dry periods where necessary. ➤ The ECoW will regularly monitor adjacent marsh fritillary larval web areas on a daily basis for potential signs of dust deposition or any other habitat degradation. Dust level thresholds and weather will also be monitored in line with the mitigations set out in Section 6.5.2.1 in Chapter 6. The ECoW will have power to halt construction works if required. ➤ If any signs of habitat degradation are noted, the dust-producing works will be immediately halted and further mitigation to protect sensitive habitats from dust will be implemented in advance of resuming work. ➤ Groundworks (i.e., works with potential to create dust) associated with proposed access track to the north of, and within 20m of, the species-rich bog will be fully supervised by an ECoW. ➤ Furthermore, Groundworks (i.e., works with potential to create dust) associated with proposed Turbines 3, 4 and 6, as well as upgrades to the existing tracks to the west of Turbine 3 will be fully supervised by an ECoW to protect marsh fritillary suitable habitats. ➤ The ECoW will perform daily visual site inspections of dust occurrence on the Site during construction, particularly during periods of dry weather and windy conditions. This will be		
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			noted as part of site environmental audits. The appointed construction manager for the contractor will be notified if dusty conditions are prevalent on site. ➤ The ECoW will have power to halt construction works if required as outlined above. ➤ The construction contractor will be required to monitor monthly dust deposition levels each month for the duration of construction phase for comparison with the guideline of 350mg/m2/day(for non-hazardous dusts). This monitoring will be carried out at a series of suitable locations within the Site. Where dust levels are measured to be above this, mitigation measures will be reviewed as part of a dust minimisation plan. ➤ A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-5). The CEMP includes dust suppression measures.		
MM143	Dust Emissions: Transport to and from the Site	Chapter 10	➤ Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored by the ECoW to avoid, insofar as reasonably possible, increased runoff. ➤ All plant and materials vehicles shall be stored in dedicated areas within the Site. ➤ Turbines components and construction materials will be transported to the Site on specified haul routes only, as agreed with the local authority. ➤ Construction materials for the Proposed Project will be sourced locally from licenced quarries, and will be covered by tarpaulin where necessary. ➤ The local roads on approach to, and within the Site will be regularly inspected for cleanliness and cleaned as necessary. ➤ Waste material that would contribute to dust emissions if retained on Site will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. ➤ Dust arising from the construction phase will be minimised by the above measures which will be implemented in full, and are incorporated into a site specific CEMP (see Appendix 4-5). ➤		

Operational Phase					
MM144	Exhaust Emissions: Proposed Project Infrastructure	Chapter 10	- Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise. - When stationary, delivery and onsite vehicles will be required to turn off engines.		
MM145	Dust Emissions: Proposed Project Infrastructure	Chapter 10	Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any dust emissions that arise.		
EIAR Chapter 11 Climate					
Construction Phase					
MM147	Greenhouse Gas Emissions	Chapter 11	- Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager will produce and follow a site inspection and machinery checklist which will be followed and updated if/when required. - All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise. - When stationary, delivery and on-site vehicles will be required to turn off engines. - Turbines and construction materials will be transported to the site on specified routes only unless otherwise agreed with the Planning Authority. - It is intended to obtain the materials for the construction of the Proposed Project from the Site. - Areas of excavation will be kept to a minimum, and stockpiling of excavated material will be minimised by coordinating excavation, placement of material in peat and spoil management areas. - A Construction and Environmental Management Plan (CEMP) (Appendix 4-5) will be in place throughout the construction phase.		

			➤ The CEMP (Appendix 4-5) includes a Waste Management Plant (WMP) which outlines the best practice procedures that will occur during the construction phase relating to waste material. • The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Project. Disposal of waste will be seen as a last resort. • Section 4.5.7 of Chapter 4 for this EIAR refers to the methodology that will be utilised to manage onsite waste. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor, • The MRF facility will be local to the Proposed Project to reduce the amount of emissions associated with vehicle movements. ➤ It is intended to obtain materials for the construction of the Proposed Project from both the onsite borrow pit and to import from local licenced quarries. The use of the onsite borrow pit will reduce the number of delivery vehicles accessing the Site, thereby reducing the amount of emissions associated with vehicle movements. ➤ Where applicable, low carbon intensive construction materials will be sourced and utilised onsite.		
Operational Phase					
MM147	Greenhouse Gas Emissions	Chapter 11	➤ Ensure that all maintenance and monitoring vehicles will be maintained in good operational order while onsite, and, when stationary, be required to turn off engines thereby minimising any emissions that arise. ➤ Any waste that does arise will be managed in accordance with best practice.		
EIAR Chapter 12 Noise					
Construction Phase					
MM149	Noise Control	Chapter 12	➤ Adoption of best-practice noise and vibration control measures in accordance with BS 5228-1 and BS 5228-2, including limiting working hours, selection of low-noise plant, regular maintenance of equipment, and positioning of plant away from noise-sensitive locations where practicable.		

			> > Refer to MM53 above for full list of noise mitigation measures during the construction phase.		
Operational Phase					
MM150	Noise Monitoring	Chapter 12	Post-commissioning operational noise monitoring will be undertaken to demonstrate compliance with the relevant noise criteria. It is common practice to commence surveys within six months of a wind farm being commissioned. In the unlikely event that an exceedance of the noise criteria is identified as part of the compliance assessment, the guidance outlined in the IOA GPG and Supplementary Guidance Note 5: Post Completion Measurements (July 2014) will be followed, and relevant corrective actions taken to ensure residual compliance with the turbine noise criteria. For example, implementation of noise reduced operational modes which are embedded within the control system of the wind turbine can be implemented for specific turbines in specific wind conditions to ensure turbine noise levels are within the relevant noise criterion curves/planning conditions limits.		
MM151	Plant Noise Compliance	Chapter 12	Careful selection and design of mechanical and electrical plant to ensure compliance with fixed plant noise criteria, including control of tonal or intermittent characteristics in accordance with BS 4142 where relevant.		
MM152	Amplitude Modulation	Chapter 12	In the unlikely event that an issue with low frequency noise is associated with the Proposed Project, an appropriate detailed investigation, by an independent acoustic consultant, shall be undertaken. Due consideration shall be given to guidance on conducting such an investigation which is outlined in Appendix VI of the EPA document NG4 (EPA, 2016). In the unlikely		

			event that a complaint is received which indicates potential amplitude modulation (AM) associated with turbine operation, an independent acoustic consultant shall be employed to assess the level of AM in accordance with the methods outlined in ISO 1996-2:2017 with modifications in IEC 61400-11-2 and the IOA Wind Turbine Noise Amplitude Modulation Working Group (AMWG) document - A Method for Rating Amplitude Modulation in Wind Turbine Noise (IOA, 2016) or subsequent revisions.		
EIAR Chapter 13 Landscape and Visual					
Pre-Construction, Construction, Operation and Decommissioning Phases					
> M154	> visual Effects	> Chapter 13	In all circumstances, excavation depths and volumes will be minimised, and excavated material will be re-used where possible. Any areas of bare soil remaining after the landscaping phase will be reseeded and left to revegetate naturally The following measures have been included in the Proposed Wind Farm design in order to avoid or reduce direct effects on landscape receptors (individual landscape features and the landscape character of the Proposed Wind Farm site as a whole) on the Proposed Wind Farm site: > The internal site access track layout makes use of the existing tracks wherever possible, to minimise the requirement for new tracks within the Site. > To minimise cut and fill activities required to construct the Proposed Project, the proposed access tracks, and other infrastructure such as hardstands have been designed to align with the existing terrain within the landscape of the Site. > In all circumstances, excavation depths and volumes will be minimised, and excavated material will be re-used where possible. > During initial vegetation stripping, all topsoil material will be temporarily stored on the Site and used for 'landscaping' the edges of the development infrastructure during reinstatement/regrading, including that of the peat and spoil management areas and proposed borrow pit. This will be particularly important in areas of cut and fill. The stripped topsoil will contain a natural seed source of local provenance and result in the re-establishment of baseline vegetation.		

			➤ The layout and design of the Proposed Project has been designed to ensure minimal loss of valuable landscape receptors and biodiversity corridors such as woodland and hedgerows along field boundaries. ➤ A Biodiversity Management and Enhancement Plan (BMEP) has been prepared as part of this EIAR and is included as Appendix 6-4 to this EIAR. Mitigation measures included in the BMEP will have a dual effect of providing ecological enhancement to the area as well as screening of some Proposed Project infrastructure, thereby providing a mitigating effect on landscape. Mitigation measures proposed in the BMEP that will also have a mitigating effect on landscape areas as follows: ➤ Avoidance of high-value peatland habitats within the Proposed Wind Farm; ➤ Proposed planting of native broadleaf trees to increase woodland habitat and bolster wildlife corridors; ➤ Proposed planting and bolstering of linear vegetation (treeline and hedgerow) to increase hedgerow and treeline habitat and bolster wildlife corridors, as well as provide visual screening of the proposed on-site 110 kV substation.		
EIAR Chapter 14 Archaeological, Architectural and Cultural Heritage					
Construction Phase					
MM155	Mitigation and Monitoring Measures During Construction Phase	Chapter 14	Prior to the commencement of construction, a programme of archaeological test trenching will be carried out at greenfield locations of the Site, including the location of the proposed turbine hardstands, proposed temporary construction compounds, proposed met mast, proposed borrow pit, along the proposed access tracks and along the underground cabling route. These works will include targeted test trenching of CH8, CH9, CH10 and CH39. This work will be carried out under licence to the National Monuments Service of the DoHLGH. Dependent on the results of the testing assessment, further mitigation may be required, such as preservation by record or in-situ and/or archaeological monitoring. Any further mitigation will require agreement from the DoHLGH. Where archaeological test trenching is not possible, such as areas dominated by forestry and bog, archaeological monitoring of topsoil stripping will be carried out. This will include works at the location of TB1. This work will be carried out under licence to the National Monuments		

			Service of the DoHLGH. If archaeological remains are identified during the course of these works further mitigation may be required, such as preservation by record or in-situ. Any further mitigation will require agreement from the DoHLGH. A pre-construction survey of CH10 (curvilinear banks forming enclosures which may relate to animal pens or field boundaries) will be carried out, resulting in the compilation of a detailed photographic and written record. This will be carried out by a suitably qualified archaeologist. An upstanding drystone wall (CH47/TB5/TB6) is located within the footprint of proposed Turbine Delivery Route accommodation works and will be removed during construction of the Proposed Project. The remains will be subject to a detailed photographic and written record prior to the construction of the Proposed Project, carried out by a suitably qualified archaeologist. Following the delivery of the turbine components the wall will be reinstated using the original materials from the removed section of wall. Where additional material is required, the same stone type will be used. The photographic and written record will be used as a reference for reconstruction of the wall. Direct effects have been identified to townland boundary TB1, as part of the construction of the Proposed Project. Works will be subject to archaeological monitoring, and a detailed photographic and written record will be made of the section of the townland boundary that is removed. This work will be carried out by a suitably qualified archaeologist under licence to the NMS.		
ElAR Chapter 15 Material Assets					
Material Assets - Traffic					
Pre-Construction, Construction and Operation					
MM156	Delivery of abnormal sized loads	Chapter 15	The following are the main points to note for these deliveries which will take place after peak evening traffic:		

			➤ The delivery of turbine components is a specialist transport operation with the transportation of components carried out at night when traffic is at its lightest and the impact minimised. ➤ The deliveries will be made in consultation with the Local Authority and An Garda Síochána. ➤ It is estimated that 56 abnormal sized loads will be delivered to the Site, comprising 19 convoys of 3 vehicles, undertaken over 19 separate nights. ➤ These nights will be spread out over an approximate period of 4 weeks and will be agreed in advance with the relevant authorities ➤ In order to manage each of the travelling convoys, for each there will be two Garda escort vehicles that will stop traffic when required at the front and rear of the convoy of 3 vehicles. ➤ There will also be two escort vehicles provided by the haulage company for each convoy.		
MM157	Traffic Management Plan	Chapter 15 Appendix 15-2	A Traffic Management Plan (TMP) is provided specifying details relating to traffic management and also included in the CEMP prior to the commencement of the construction phase of the Proposed Project. The detailed TMP will be agreed with the local authority and An Garda Síochána prior to construction works commencing onsite. The detailed TMP will include the following: ➤ Traffic Management Coordinator – a competent Traffic Management Co-ordinator will be appointed for the duration of the development, and this person will be the main point of contact for all matters relating to traffic management. ➤ Delivery Programme – a programme of deliveries will be submitted to Mayo County Council in advance of deliveries of turbine components to the Site. Liaison with the relevant local authorities, TII and MMarC and will be carried out where required regarding requirements such as delivery timetabling. The programme will ensure that deliveries are scheduled in order to minimise the demand on the local network and minimise the pressure on the access to the Site. ➤ Information to locals – Locals in the area will be informed of any upcoming traffic related matters e.g. temporary lane/road closures (where required) or delivery of turbine components at night, via letter drops and posters in public places. Information will include the contact details of the Project Co-ordinator, who will be the main point of contact for all		

			queries from the public or local authority during normal working hours. An "out of hours" emergency number will also be provided. ➤ A Pre and Post Construction Condition Survey – Where required by the local authority, a pre-condition survey of roads associated with the Proposed Project will be carried out immediately prior to construction commencement to record an accurate condition of the road at the time. A post construction survey will be carried out after works are completed to ensure that any remediation works are carried out to a satisfactory standard. Where required the timing of these surveys will be agreed with the local authority. All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers. ➤ Liaison with the relevant local authority - Liaison with Mayo County Council and An Garda Síochána, will be carried out during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required. Once the surveys have been carried out and “prior to commencement” status of the relevant roads established, (in compliance with the provisions of the CEMP), the Roads section will be informed of the relevant names and contact numbers for the Project Developer/Contractor Site Manager as well as the Site Environmental Manager. ➤ Implementation of temporary alterations to road network at critical junctions – at locations highlighted in Section 15.1.9. In addition, in order to minimise the impact on the existing environment during turbine component deliveries the option of blade adaptor trailers will also be used where deemed practicable. ➤ Identification of delivery routes – These routes will be agreed with Mayo County Council and adhered to by all contractors. ➤ Delivery times of large turbine components - The TMP will include the option to deliver the large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage. ➤ Travel plan for construction workers – While the assessment above has assumed the worst case in that construction workers will drive to the Site, the construction company will be required to provide a travel plan for construction staff, which will include the identification of routes to / from the Site and identification of an area for parking. ➤ Additional measures - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including		
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			wheel washing facilities on site and sweeping / cleaning of local roads as required. These are set out in the CEMP which is contained in Appendix 4-5. ➤ Re-instatement works - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.		
Material Assets – Other Material Assets, Telecommunications and Aviation					
Construction Phase					
MM159	Existing Built Services	Chapter 4, 15	➤ The construction of the Proposed Grid Connection will be in phases along the proposed on-site 982m underground grid cabling route, to minimise the duration of outage whilst making the connection to the Castlebar-Cloon 110kV OHL. ➤ The suitability of machinery and equipment for use near power lines will be risk assessed by the Project Supervisor Construction Stage (PSCS). ➤ All staff will be trained on operating voltages of overhead electricity lines running the Site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the sites are made aware of the location of lines before they come on to site. ➤ Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire. ➤ When activities must be carried out beneath overhead lines, e.g., component delivery or end mast construction, a site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works. Overhead line proximity detection equipment will be fitted to machinery when such works are required. ➤ Information on safe clearances will be provided to all staff and visitors. ➤ Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and on site. ➤ All staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the site Health and Safety Plan.		

			➤ All health and safety measures as detailed in the Construction Environment Management Plan and Chapter 5 Population and Human Health will be adhered to during the construction, operation and decommissioning phases. ➤ Liaison will be had with the relevant sections of the Local Authority including all the relevant area engineers to ensure all services are identified. ➤ Excavation permits will be completed, and all plant operators and general operatives will be inducted and informed as to the location of any services. ➤ The contractor must comply with and implement standard construction codes of practice in relation to working around electricity, gas, water, sewage and telecommunications networks. ➤ Prior to construction, the Applicant will engage with GNI via the 'Dial Before You Dig' procedure online. GNI will be contacted on 1800 42 77 47 before excavating near the identified medium-pressure pipeline adjacent to the temporary site entrance. Furthermore, the 'Safety advice for working in the vicinity of natural gas pipelines' guidance document and the GNI 'Code of Practice' standards will be adhered to during all proposed works in vicinity of gas pipelines. ➤ The Applicant will also carry out further consultation in the pre-construction phase and construction phase with GNI to ensure that no new gas pipelines have been implemented. ➤ In advance of any construction activity, the contractor will undertake pre-commencement surveys to confirm the presence or otherwise of any services such as water supply. If found to be present, the relevant service provider will be consulted with in order to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works. ➤ As noted in the preceding sections, scoping consultation with Uisce Eireann identified a water mains that traverses through the Site. If the Proposed Project receives a grant of permission, the Applicant commits to liaise with Uisce Eireann to redirect the pipe, with diversion being done before commencement of construction work to maintain water supply during construction, in accordance with Uisce Eireann. ➤ In the event that any additional water mains are encountered, the water supply will be turned off by the utility so work can commence on diverting the service. The section of existing pipe will be removed and will be replaced with a new pipe along the new alignment of the service. The works will be carried out in accordance with the specifications of the relevant utility provider.		
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MM160	Waste Management	Chapter 15	> The CEMP, Appendix 4-5 of this EIAR, includes a Waste Management Plan (WMP) which outlines the best practice procedures during the construction and decommissioning phases of the project. > Waste management will be carried out in accordance with 'Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects '(2021) produced by the EPA. The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Project. Disposal of waste will be seen as a last resort. > All hazardous wastes will be stored in bunded containers/areas before being collected by an authorised waste contractor and brought to an EPA licensed waste facility. Hazardous wastes will be kept separate from non-hazardous wastes that contamination does not occur. Please see the CEMP for best practise measures to prevent the creation of waste materials. > All non-hazardous waste generated on-site by the Proposed Project will be contained in waste skips at a waste storage area on-site. This waste storage area will be kept tidy with skips clearly labelled to indicate the allowable material to be disposed of therein. > The expected waste volumes generated on-site are unlikely to be large enough to warrant source segregation at the Site. Therefore, all waste streams generated on-site will be deposited into a single waste skip. This waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. > The waste generated from the turbine erection will be limited to the associated protective covers which are generally reusable. Considering the specialist nature of this packaging material the majority will be taken back by suppliers for their own reuse. Any other packaging waste generated from the turbine supply will be deposited into the on-site skips and subsequently transferred to the MRF. > It is not envisaged that there will be any waste material arising from the materials used to construct the site access tracks as only the quantity of stone necessary will be sourced from local quarries and brought on site on an 'as needed' basis. > Site personnel will be instructed at induction that under no circumstances can waste be brought to site for disposal in the on-site waste skip. It will also be made clear that the burning of waste material on-site is forbidden.		

Operational Phase					
MM161	Telecommunications	Chapter 15	In the event of interference occurring to telecommunications, the Guidelines (DoEHLG, 2006) acknowledge that '<i>electromagnetic interference can be overcome</i>' by the use of divertor relay links out of line with a wind farm. A signed protocol agreement between 2rn and the Applicant can be found in Appendix 15-5. The Protocol Document ensures that in the event of any interference occurring to television or radio reception due to operation of the Proposed Wind Farm, the required measures, as set out in the Protocol Document, will be carried out by the Applicant to rectify this. The Protocol Document ensures that the appropriate mitigation is carried out in the event of unanticipated broadcast interference arising to television or radio reception as a result of the Proposed Wind Farm.		
MM162	Aviation	Chapter 15	As no impacts were identified by the IAA or DoD, no mitigation measures are required. However, the following IAA and DoD requests will be complied with should the Proposed Project be consented: <u>Irish Aviation Authority</u> ➤ Agree an aeronautical obstacle warning light scheme for the wind turbine development ➤ Provide as-constructed coordinates in WGS84 format together with ground and blade tip height elevations at each wind turbine location and ➤ Notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection. <u>Department of Defence</u> ➤ All turbines should be illuminated by Type C, Medium intensity, Fixed Red obstacle lighting with a minimum output of 2,000 candela to be visible in all directions of azimuth and to be operational H24/7 days a week.		

			<i>Obstacle lighting should be incandescent or, if LED or other types are used, of a type visible to Night Vision equipment. Obstacle lighting used must emit light at the near InfraRed (IR) range of the electromagnetic spectrum, specifically at or near 850 nanometres (nm) of wavelength.</i> ➤ <i>Light intensity to be of similar value to that emitted in the visible spectrum of light.</i> <u>Annex 15 – Aerodrome Surfaces</u> Due to the Site being located within the ICAO Annex 15 Aerodrome Surface, should the Proposed Project receive planning permission the proposed wind turbines will be included in the IAA Terrain and Obstacle Data Set (eTOD). <u>Garda Air Support Unit</u> In the unlikely event of Garda Air Support Unit operations in the general area, it should be noted that all modern aircraft are equipped with a range of Global Navigation Satellite Systems (GNSS), e.g. GPS, GLNASS, Galileo, etc. These GNSS systems provide pilots with accurate navigation information including data to avoid obstacles during VFR operations. Should the Proposed Project be permitted, the associated turbine locations would be submitted to AirNav Ireland and aviation charts and GNSS databases will be updated accordingly		
MM163	Waste Management	Chapter 15	Any waste generated due to the operation and maintenance of the Proposed Project will be disposed of in a covered skip, located within the proposed onsite 110kV substation compound. The waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licenced waste contractor where the waste will be sorted into individual waste stream for recycling, recovery or disposal.		

9. **MONITORING PROPOSALS**

All monitoring proposals relating to the pre-commencement, construction and operational phases of the Proposed Project are set out in various sections of the EIAR, NIS and Biodiversity Enhancement Plan prepared as part of the planning application to Mayo County Council.

This section of the Construction and Environment Management Plan groups together all of the monitoring proposals presented in the EIAR. The monitoring proposals are presented in the following pages. The monitoring proposals are also outlined within Chapter 18: Schedule of Mitigation and Monitoring Measures. Decommissioning Phase monitoring measures are not included in the table below, however, can be viewed in Appendix 4-6 (Decommissioning Plan) of this EIAR.

By presenting the monitoring proposals in the below format, it is intended to provide an easy to audit list that can be reviewed and reported on during the future phases of the Proposed Project. The tabular format in which the below information is presented, can be further expanded upon during the course of future project phases to provide a reporting template for site compliance audits.

Table 9-1 Proposed Monitoring Measures

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
Pre-Construction Phase						
MX1	Water Quality and Monitoring	Appendix 4-5	➤ Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement of felling and construction at the Site. ➤ Analysis will be for a range of parameters with relevant regulatory limits along with Environmental Quality Standards (EQSs) and sampling will be undertaken at designated locations within the Site. ➤ Baseline sampling will be completed on at least two occasions, and these should ideally coincide with low flow and high flow stream conditions. The high flow sampling event will be undertaken after a period of sustained rainfall, and the low flow event will be undertaken after a dry spell. ➤ An inspection and maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works.	As required	As Necessary	ECoW
MX2	Invasive Species	Chapter 6 Appendix 6-5	The ISMP allows for the monitoring of areas outside the Proposed Project footprint, and their treatment, subject to the necessary permissions being in place.			

MX3	Birds	Chapter 7	- Any requirement for construction works to run into the subsequent breeding or winter seasons following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding or roosting birds of conservation concern. These surveys will be conducted once per month during the breeding season (April to July) and once at the start of the winter season (October). The survey will aim to identify sensitive sites (e.g., nests or roosts depending on the season in question). - This monitoring will involve surveying onsite and to a 500m radius of the development footprint/works areas, and within the historic curlew breeding area. Monitoring will be undertaken by a suitably qualified ornithologist. The survey period will include one month prior to the initiation of works, four visits between April and July and one visit during the winter period (October). If a sensitive area is identified, the nest/roost sites will be located, and no works shall be undertaken within a species-specific buffer in line with best practice guidance (e.g. Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007). No works within the buffer zone shall be permitted until it can be demonstrated that the species is no longer reliant on the area for breeding or roosting. - Additional monitoring will be conducted within the Site to identify if curlew are breeding within the Site. Methods will follow those outlined in Gilbert et al. (1998) from April to July during each year of construction. If a nest is located, no works shall be undertaken within 300m of the breeding area (as per breeding season buffer zones in Goodship and Furness, 2022).	Once	As required	Project Ecologist
Construction Phase						

MX4	Tree Felling Drainage Monitoring	Chapter 4 Appendix 4-5	➤ Conduct daily and weekly inspections of all water protection measures and visually assess their integrity and effectiveness in accordance with Section 3.4 (Monitoring and Recording) and Appendix 3 (Site Monitoring Form (Visual Inspections)) of the Forestry & Freshwater Pearl Mussel Requirements. ➤ Take representative photographs showing the progress of operation onsite, and the integrity and effectiveness of the water protection measures. ➤ Collect water samples for analysis by a 3rd party accredited laboratory, adhering to the following requirements: ➤ Surface water samples shall be collected upstream and downstream of the keyhole felling at suitable sampling locations. ➤ Sampling shall be taken from the stream / riverbank, with no in-stream access permitted. ➤ The following minimum analytical suite shall be used: pH, EC, TSS, BOD, Total P, Ortho-P, Total N, and Ammonia. ➤ Review of operator's records for plant inspections, evidence of contamination and leaks, and drainage checks made after extreme weather conditions. ➤ Checking and maintenance of access tracks and culverts will be on-going through any felling operation. No tracking of vehicle through watercourses will occur, as vehicles will use access tracks. Where possible, existing drains will not be disturbed during felling works; Checking and maintenance of access tracks and culverts will be on-going through the felling operation;	Daily and Weekly	Weekly	ECoW
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MX5	Potential Effects on Raised bog – Habitat Degradation – Dust Deposition	Chapter 6	The construction contractor will be required to monitor monthly dust deposition levels each month for the duration of construction phase for comparison with the guideline of 350mg/m ² /day (for non-hazardous dusts). This monitoring will be carried out at a series of suitable locations within the Site. Where dust levels are measured to be above this, mitigation measures will be reviewed as part of a dust minimisation plan.	Daily	As Necessary	EnvCoW / Project Hydrologist
MX6	Potential Effects due to the Spread of Invasive Species – Japanese knotweed	Chapter 6	The areas of Japanese knotweed outside of the Proposed Project footprint have potential to continue to spread through the Site over the lifetime of the Proposed Project, if left untreated. Therefore, the developer has committed to an extensive treatment plan of all areas of Japanese knotweed identified within the Site. The ISMP allows for the monitoring of areas outside the Proposed Project footprint, and their treatment, subject to the necessary permissions being in place. ➤ The management and monitoring measures are included within Section 4.6 of Appendix 6-5 of this EIAR.	Weekly	As Necessary	EnvCoW
MX7	Potential for Effects on Bats during Operation	Chapter 6	➤ A minimum three-year programme of post-construction monitoring, comprising carcass searches and acoustic monitoring, to validate the effectiveness of the mitigation strategy; ➤ Adaptive management of curtailment measures if monitoring identifies elevated mortality or unforeseen effects. ➤ A detailed bat monitoring plan is outlined in Section 6.4 of the Bat Report (Appendix 6-2).	As Required	Monthly	EnvCoW
MX8	Plant and Equipment Inspections	Chapter 9	The plant used will be regularly inspected for leaks and fitness for purpose.	As Required	Monthly	EnvCoW

MX9	Peat and subsoil excavation	Chapter 8	Movement monitoring instrumentation will be placed around the areas where peat has been placed. The locations where monitoring is required will be identified by the Project Geotechnical Engineer on site	Daily	Daily	Project Geotechnical Engineer
MX10	Erosion of Exposed Peat, Soils and Subsoils During Tree Felling	Chapter 8	The condition of the racks will be continually monitored and fresh brash will be applied when the brash mat becomes heavily used and worn, ensuring that the mat remains effective throughout the operational phase	Daily	Daily	ECoW
MX11	Potential Hydrological/Water Quality Effects on River Waterbody Drinking Water Supply Abstractions (Proposed Project)	Chapter 9	Daily inspections will be undertaken to assess the effectiveness of the water treatment trains and this will include a visual assessment of water quality and also portable probes for field hydrochemistry monitoring (turbidity, pH, electrical conductivity etc) will be used by the ECoW to make on the spot checks. Corrective measures will be carried out as appropriate (i.e. silt build-up removal or replacement/upgrade works) in the event treatment is ineffective.	Daily	Daily	ECoW
MX12	Clear Felling of Coniferous Plantation and Potential Surface Water Quality Effects	Chapter 9	➤ The following items shall be carried out during pre-felling inspections and after: ➤ Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines; ➤ Inspection of all areas reported as having unusual ground conditions; ➤ Inspection of main drainage ditches and outfalls. During pre-felling inspections the main drainage ditches shall be identified.	Monthly	Monthly	ECoW

			Ideally the pre-felling inspection shall be carried out during rainfall; ➤ Following tree felling all main drains shall be inspected to ensure that they are functioning; ➤ Extraction tracks near drains need to be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground; ➤ Culverts on drains exiting the site will be unblocked; and, All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall.			
MM13	Water Quality and Monitoring (Daily Visual Inspections)	Appendix 4-5	➤ Daily visual inspections of drains and outfalls will also be performed during the construction period to ensure suspended solids are not entering streams and rivers on site, to identify any obstructions to channels and to allow appropriate maintenance of the drainage regime. ➤ During the construction phase, field testing and laboratory analysis of a range of parameters with relevant regulatory limits and EQSs shall be undertaken for each primary watercourse along the Proposed Grid Connection and within the Proposed Wind Farm site, and specifically following heavy rainfall events (i.e. weekly, monthly and event based). ➤ Inspection sheets and photographic records will be kept on site. Inspection points will include the in-situ field monitoring point locations and the laboratory analysis sampling points. Inspection points will depend on works being completed within the catchment upstream of the identified monitoring locations. ➤ Visual inspections will also be completed after major rainfall events, i.e. after events of >25mm rainfall in any 24-hour period and data including photographs will be collected by visual	Daily	Weekly	Project Hydrologist & ECoW as required

			inspections and independently assessed by the Project Hydrologist who will monitor and advise on the records being received. > > The following periodic inspection regime will be implemented: > > Daily general visual inspections of site operations and inspections of all drainage infrastructure within the Site and in the surrounding area by the ECoW or a suitably qualified and competent person as delegated by the ECoW; > Inspections to include all elements of drainage infrastructure to ensure the system is operating correctly and to identify and maintenance that is required. Any changes, such as discolouration, odour, oily sheen or litter will be noted and corrective action will be implemented. High risk locations such as settlement ponds will be inspected daily. Daily inspections checks will be completed on plant and equipment, and whether materials such as straw bales or oil absorbent materials need replacement; > Event based inspections by the ECoW as follows: > >10 mm/hr (i.e. high intensity localised rainfall event); > >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, > Rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week). > Monthly site inspections by the Project Hydrologist/ ECoW during construction phase; > Quarterly site inspections by the Project Hydrologist/ ECoW after construction for a period of one year following the construction phase; and,			
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			➤ A written record will be maintained or available on-site within this CEMP which will be maintained on-site during the construction phase.			
MX14	Water Quality and Monitoring (Continuous Turbidity Monitoring)	Appendix 4-5	➤ Turbidity monitors or sondes can be installed where required at locations surrounding the Site. The sondes will provide continuous readings for turbidity levels in the watercourse.	On going	As required	ECoW
MX15	Water Quality and Monitoring (Laboratory Analysis)	Appendix 4-5	➤ Baseline laboratory analysis of a range of parameters with relevant regulatory limits and EQSs shall be undertaken as per water monitoring programme for the Proposed Project. This will not be restricted to just these locations around the Site further sampling points added as deemed necessary by the ECoW in consultation with the Project Hydrologist and Site Manager.	As necessary	As required	ECoW
MX16	Water Quality and Monitoring (Field Monitoring)	Appendix 4-5	➤ Field chemistry measurements of unstable parameters, (pH, conductivity, temperature) will be taken at the surface water monitoring locations. ➤ These analyses will be carried out by either the ECoW or the Project Hydrologist. ➤ In-situ field monitoring will also be completed after major rainfall events, i.e. after events of >25mm rainfall in any 24-hour period. ➤ The Project Hydrologist will monitor and advise on the readings collected by in-situ field monitoring.	As necessary	As required	Project Hydrologist
MX17	Construction Phase Drainage Inspections & Maintenance	Appendix 4-5	➤ Regular inspections of all existing and installed drainage measures shall be undertaken by the Project Contractor, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water within the system.	Weekly	Weekly	Project Contractor

			➤ The contractor shall devise a system of recording the findings of these inspections. Any excess build-up of silt levels at check dams, the settlement ponds, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed. For this reason, the drainage measures installed on-site shall be inspected at least weekly by the contractor and maintained as required during the construction phase of the Proposed Project to ensure good performance. ➤ The ECoW will monitor the effectiveness of the on-site drainage during changing weather, ground or drainage conditions encountered on site, through their regular visual inspections of on-site watercourses and water monitoring programme. ➤ Where it appears that additional drainage measures will be required to ensure the drainage system remains effective, the ECoW will notify the contractor, the developer and project design team including the Project Hydrologist. ➤ The ECoW's role in this regard does not replace the need for the weekly (at least) inspections of the drainage system's measures by the Project Contractor.			
MX18	Surface Water Monitoring Reporting	Appendix 4-5	➤ Visual inspection and laboratory analysis results of water quality monitoring shall assist in determining requirements for any necessary improvements in drainage controls and pollution prevention measures implemented on site. ➤ It will be the responsibility of the ECoW to present the ongoing results of water quality and weather monitoring at or in advance of regular site meetings. ➤ Reports on water quality will consider all field monitoring and visual inspections, and results of laboratory analysis completed for that period. Reports will describe how the results compare with baseline data as well as previous reports on water quality. The reports will also describe whether any deterioration or improvement in water quality has been observed, whether any	As necessary	As required	ECoW

			effects are attributable to construction activities and what remedial measures, or corrective actions have been implemented. Any proposed alteration to sampling frequency will be agreed with the Planning Authority in advance.			
MX19	Peat and Spoil Management (Construction and Reinstatement of Borrow Pits)	Appendix 4-3	Supervision by the Project Geotechnical Engineer is required for the development of the borrow pits.	As necessary	As required	Project Geotechnical Engineer
MX20	Peat and Spoil Management (Designated Peat and Spoil Management Areas alongside Access tracks/ Clearfell Areas)	Appendix 4-3	- Movement monitoring instrumentation will be placed around the areas where peat has been placed. - The locations where monitoring is required will be identified by the Project Geotechnical Engineer on Site. - Supervision by the Project Geotechnical Engineer is required for the works.	As necessary	As required	Project Geotechnical Engineer
MX21	Peat and Spoil Management (General Commitments for Good Construction Practice)	Appendix 4-3	- Installation and regular monitoring of geotechnical instrumentation during construction in areas of possible poor ground, such as deeper peat deposits - Site reporting procedures will be implemented to ensure that working practices are suitable for the encountered ground conditions. Ground conditions to be assessed by suitably experienced geotechnical engineer. - Regular briefing of all site staff (e.g. toolbox talks) to provide feedback on construction and ground performance and to promote reporting of any observed change in ground conditions.	Monthly	Monthly	Project Geotechnical Engineer

			➤ Routine inspection of the Proposed Wind Farm by the Contractor and Project Geotechnical Engineer will be undertaken and will include an assessment of ground stability conditions (e.g. cracking, excessive floating access track settlement, disrupted surface, closed-up drains) and drainage conditions (e.g. blocked drains, absence of water in previously flowing drains, springs, etc).			
MX22	Movement Monitoring Posts	Appendix 4-3	➤ To monitor possible peat movements, it is proposed to install sighting posts upslope and downslope of the access tracks and turbine hardstands at staggered intervals at locations where the peat depth is greater than 1.5m. Additional monitoring locations will be required at infrastructure locations with deeper peat deposits, as determined by the Designer or Project Geotechnical Engineer. Details of sighting posts are given below: ➤ A line of sighting posts will comprise: ➤ A line of wooden stakes (typically 1 to 1.5m long) placed vertically into the peat to form a straight line. ➤ The sighting line will comprise 6 no. posts at 5m centres that is a line some 25m long. ➤ A string line will be attached to the first and last posts and all intervening posts will be adjusted so they are just touching the string line. ➤ Lines of sighting posts will be placed across the existing slope about 5m away from the area to be ➤ worked. The posts will be located along the access tracks at 10m intervals in areas of deep peat (say greater than 2.0m). Where there are relatively steeper slopes or softer ground a sighting line will be placed down the slope, or at any location where monitoring is deemed necessary by the Designer or the Project Geotechnical Engineer. ➤ Each line of sighting posts will be uniquely referenced with each post in the line given a reference.	Daily	Daily	Project Geotechnical Engineer

			➤ The post reference will be marked on each post (e.g. reference 1-1, 1-2, 1-3, 1-4, 1-5, 1-6 for posts in line 1). ➤ The sighting lines will be monitored at the beginning of each working day, and during the day where considered appropriate (e.g. when working activity is concentrated at a specific location) or following heavy/prolonged rainfall. ➤ Monitoring of the posts will comprise sighting along the line and recording any relative movement of posts from the string line. ➤ Where increased movements are recorded the frequency of monitoring will be increased, or works in the area restricted until movement ceases. ➤ A monitoring record will be kept of the date, time and relative movement of each post, if any. This record will be updated and stored as a spreadsheet. ➤ ➤ Where there is excessive movement or continuing peat movement recorded at a monitoring location or identified at any location within the Site but no apparent signs of distress to the peat (e.g. cracking, surface rippling) then the following will be carried out: ➤ ➤ All activities (if any) will cease within the affected area. ➤ Increased monitoring at the location will be carried out. The area will be monitored until such time as movements have ceased. ➤ Re-commencement of activities will only start following a cessation of movement and agreement with all parties (Contractor/Engineer/Designer).			
MX23	Dust Emissions (Construction of Proposed Project Infrastructure,	Chapter 10 Appendix 4-5	➤ The agreed haul route roads adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary. ➤ The roads adjacent to the Proposed Wind Farm site entrance will be checked weekly for damage/potholes and repaired as necessary.	Weekly	As required	Site Supervisor/Co nstruction Manager

	Transport to and from the Site)					
MX24	Exhaust Emissions	Chapter 10	- Proposed Project construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. - The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required.	As necessary	As required	Site Supervisor/Construction Manager
MX25	Spill Control	Appendix 4-5	- The ECoW will inspect the Site and will assist by providing any advice possible to ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring. - The Construction Manager will notify the appropriate regulatory body such as Cork County Council, Inland Fisheries Ireland (IFI), National Parks and Wildlife Service (NPWS), etc. if deemed necessary. - The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. Environmental incidents are not limited to just fuel spillages. Therefore, any environmental incident must be investigated in accordance with the following steps. - The ECoW must be immediately notified. - If necessary, the Construction Manager will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident. - The details of the incident will be recorded on an Environmental Incident Form which will provide information such as the cause, extent, actions and remedial measures used following the incident. The form will also include any recommendations made to avoid reoccurrence of the incident.	As required	As necessary	ECoW

			➤ If the incident has impacted on an ecologically sensitive receptor, such as a sensitive habitat, protected species or designated conservation site (pSPA or cSAC), the ECoW will liaise with the Project Ecologist. ➤ If the incident has impacted on a sensitive receptor such as an archaeological feature the ECoW will liaise with the Project Archaeologist			
MX25	Greenhouse Gas Emissions	Chapter 11	➤ Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required.			
MX27	Construction Phase Noise	Chapter 12	➤ Construction management includes monitoring of the construction operations to confirm the noise generated due to the works do not exceed the construction limits; ➤ Monitoring conducted will be targeted at those activities with the greatest potential to generate noise, such as blasting or rock breaking, and will be undertaken in accordance with the principles of BS 5228. ➤ The purpose of such monitoring will be to verify compliance with the adopted limits and to inform construction management practices, where necessary.	As necessary	As required	ECoW
MX28	Traffic and Transport	Appendix 4-5	➤ The agreed haul route roads adjacent to the site will be regularly inspected for cleanliness and cleaned as deemed necessary by the construction Site Supervisor/Site Manager.	As required	Monthly	EnvCoW
MX29	Archaeological Monitoring	Chapter 13	Archaeological monitoring of ground works during the construction stage of the Proposed Project under licence from the NMS will be carried out by a suitably qualified archaeologist. Should	As Required	As Required	Project Archaeologist

			archaeological finds, structures or deposits be uncovered as a result of the monitoring further mitigation measures such as preservation in situ or preservation by record (excavation) may be required and will be decided in consultation with the NMS. Such mitigation measures will be implemented where relevant following consultation with the NMS. A report detailing the results of the monitoring and/or any further necessary mitigation as referred to above will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body.			
MX30	Felling	Chapter 4, 9 Appendix 4-5	➤ All existing dry forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps; ➤ Clean water diversion drains will be installed upgradient of the works areas; ➤ Check dams/silt fence arrangements (silt traps) will be placed in all existing forestry drains that have surface water flows and also along existing forestry trackside drains. Before the commencement of any felling works, an ECoW shall be appointed to oversee the works. The ECoW shall be experienced and competent, and shall have the following functions as proposed in the planning application: ➤ Attend the Site for the setup period when drainage protection works are being installed and be present onsite during the remainder of the forestry keyhole felling works. ➤ Prior to the commencement of works, review and agree the positioning by the Operator of the required Aquatic Buffer	Weekly	As Necessary	EnvCoW

			Zones (ABZs) i.e., 10m drainage and 50m watercourse where required, silt traps, silt fencing, water crossings and onsite storage facilities for fuel, oil and chemicals. ➤ Be responsible for preparing and delivering the Environmental Tool Box Talk (TBT) to all relevant parties involved in site operations, prior to the commencement of the works. ➤ Conduct daily and weekly inspections of all water protection measures and visually assess their integrity and effectiveness in accordance with Section 3.4 (Monitoring and Recording) and Appendix 3 (Site Monitoring Form (Visual Inspections)) of the Forestry & Freshwater Pearl Mussel Requirements. ➤ Take representative photographs showing the progress of operations onsite, and the integrity and effectiveness of the water protection measures. ➤ Collect water samples for analysis by a 3rd party accredited laboratory, adhering to the following requirements: ○ Surface water samples shall be collected upstream and downstream of the keyhole felling at suitable sampling locations. ○ Sampling shall be taken from the stream / riverbank, with no in-stream access permitted. ○ The following minimum analytical suite shall be used: pH, EC, TSS, BOD, Total P, Ortho-P, Total N, and Ammonia. ➤ Review of operator's records for plant inspections, evidence of contamination and leaks, and drainage checks made after extreme weather conditions. ➤ Prepare and maintain a contingency plan. ➤ Suspend work where potential risk to water from siltation and pollution is identified, or where operational methods and mitigation measures are not specified or agreed.			
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			Prepare and maintain a Water Protection Measure Register. This document is to be updated weekly by the ECoW.			
MX31	Mitigation and Monitoring Measures During Construction Phase	Chapter 14	Where archaeological test trenching is not possible, such as areas dominated by forestry and bog, archaeological monitoring of topsoil stripping will be carried out. This will include works at the location of TB1. This work will be carried out under licence to the National Monuments Service of the DoHLGH. If archaeological remains are identified during the course of these works further mitigation may be required, such as preservation by record or in-situ. Any further mitigation will require agreement from the DoHLGH.	Daily	Daily	PSCS
Operational Phase						
MX32	Drainage Inspections	Appendix 4-5	The drainage system will be monitored in the operational phase until such a time that all areas that have been reinstated become re-vegetated and the natural drainage regime has been restored. Silt fences will be inspected regularly to ensure water is continuing to flow through the fabric, and the fence is not coming under strain from water backing up behind it.	Monthly	Monthly	ECoW
MX33	Wastewater management	Chapter 4	The wastewater storage tank alarm will be part of a continuous stream of data from the Proposed Wind Farm turbines, wind measurement devices and proposed 110kV onsite substation that will be monitored remotely 24 hours a day, 7 days per week	Continuous	Daily	ECoW
MX34	Bats	Chapter 6	A programme of post-construction monitoring (PCM) will be implemented to assess the effects of the Proposed Wind Farm on bat activity and collision mortality, and to evaluate the effectiveness of	Years 1, 2, 3	Annually	Project Ecologist

		Appendix 6-2	the mitigation measures described above, including blade feathering and site-specific curtailment. The primary objective of the monitoring programme is to evaluate the effectiveness of the mitigation strategy and to ensure that the <i>Favourable Conservation Status</i> of local bat populations is maintained, as required under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended). The monitoring programme has been designed in accordance with NatureScot (2021), NIEA (2021) and BCI (2026) guidance and will follow an adaptive management approach. In accordance with NatureScot (2021) and BCI (2026), PCM will comprise two integrated components: ➤ Fatality monitoring (carcass searches) to quantify collision mortality; and ➤ Acoustic monitoring to assess bat activity patterns and potential displacement or attraction effects. Given that collision risk for Leisler's bat was identified as <i>Medium</i> at peak activity levels, with activity concentrated during late summer and early autumn and around sunset and sunrise periods, the monitoring programme is specifically designed to validate the effectiveness of the site-specific curtailment strategy. ➤ <u>Fatality Monitoring</u> Carcass searches will be undertaken to quantify bat mortality associated with turbine operation.			
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			In accordance with NatureScot (2021) and BCI (2026), professionally trained canine search teams will be utilised as the primary method of carcass detection. This reflects the reduced efficiency of human-led searches in Irish upland and vegetated landscapes. Searches will be undertaken at all turbines within a radius of 80 m from the turbine base, equivalent to half the turbine tip height (160 m), in accordance with best practice guidance. Search frequency will be as follows: ➤ Peak season (mid-August to October): weekly searches, ➤ Standard season (April to mid-August): fortnightly searches. Carcass persistence (scavenger removal) trials and searcher efficiency (SEEF) trials will be undertaken to allow robust estimation of collision mortality. ➤ Carcass persistence trials: A minimum of 10 trial carcasses will be deployed and monitored (e.g. using camera traps or regular checks) to determine mean persistence time. ➤ Searcher efficiency trials: Searcher efficiency trials will be undertaken to quantify the probability of carcass detection. These trials will involve the placement of trial carcasses within the search area and subsequent assessment of detection rates by the survey team. The results will be used to derive site-specific correction factors for the estimation of collision mortality. These data will be used to correct observed carcass counts and calculate realistic estimates of bat mortality.			
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			> <u>Acoustic Monitoring</u> Post-construction acoustic monitoring will be undertaken to assess bat activity patterns and to validate the effectiveness of the curtailment strategy. Static detectors will be deployed at ground level in accordance with the pre-construction survey design to allow direct comparison with baseline conditions. In addition, two turbines will be fitted with nacelle-mounted ultrasonic detectors, in accordance with BCI (2026) guidance (minimum one detector per three turbines). These detectors will record bat activity at rotor height. Nacelle-level activity will be compared with baseline and ground-level data to assess bat activity in relation to turbine operation. Analysis will focus on: > seasonal patterns of activity, > within-night activity (particularly sunset and sunrise periods), and > activity in relation to weather conditions and turbine operation. > <u>Mortality threshold and adaptive management</u> Collision mortality will be estimated using corrected carcass search data, accounting for carcass persistence and searcher efficiency.			
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			For the purposes of this assessment, a threshold of greater than one bat per turbine per year is defined as a level at which collision mortality may be considered significant, in line with NIEA (2021) guidance. The results of post-construction monitoring will be reviewed annually. ➤ Where monitoring demonstrates that collision mortality remains below this threshold and that mitigation measures are effective, the existing curtailment strategy will be maintained. ➤ Where mortality exceeds this threshold, curtailment measures will be strengthened. This may include extending the seasonal curtailment period, increasing the duration of nightly curtailment, or adjusting wind speed and temperature thresholds. ➤ <u>Monitoring Duration and Reporting</u> Post-construction monitoring will be undertaken for a minimum of three years following commissioning of the Proposed Wind Farm. At the end of Year 3, a synthesis report will be prepared and submitted to the Planning Authority by the appointed bat ecologist on behalf of the wind farm operator. Where mortality remains below the defined threshold, the curtailment regime in place at that time will be maintained. Additional post-construction monitoring may be undertaken at five-year intervals from Year 5 of operation onwards, subject to the outcomes of the initial monitoring programme and agreement with the relevant authorities.			
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			Where mortality exceeds the threshold, curtailment measures will be strengthened, and monitoring will be extended for a further two years. An annual monitoring report will be prepared and submitted to the Planning Authority and relevant statutory consultees. Each report will include: ➤ bat activity data and analysis, ➤ observed fatalities and corrected mortality estimates, ➤ assessment of mitigation effectiveness, and ➤ recommendations for any required adjustments to the mitigation strategy. Transition to Smart Curtailment (Optional Optimisation Pathway) At the end of Year 3, and subject to the outcomes of post-construction monitoring, the Applicant may submit a Mitigation Review Report to the Planning Authority and the National Parks and Wildlife Service (NPWS), in accordance with BCI (2026) guidance. Where monitoring demonstrates that collision mortality remains below the defined significance threshold and confirms that periods of elevated risk are confined to specific temporal or environmental conditions, the curtailment strategy may be refined to more accurately reflect the site-specific risk profile. In this context, the Applicant may elect to implement a Smart Curtailment system, whereby turbine operation is dynamically controlled based on real-time detection of bat activity at rotor height (e.g. using nacelle-mounted detectors integrated with turbine control systems). Under such a system, turbines would curtail or shut down			
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			only when bats are detected within, or approaching, the rotor-swept zone, thereby directly targeting periods of actual collision risk. This approach allows curtailment to be focused and responsive, rather than applied across broad seasonal or nightly windows, and may therefore reduce unnecessary turbine downtime while maintaining effective protection for bats. In accordance with BCI (2026), implementation of Smart Curtailment must be supported by a minimum of three years of robust post-construction monitoring data demonstrating that refinement of the mitigation strategy is appropriate. Where Smart Curtailment is implemented, a post-implementation re-validation audit will be undertaken at intervals of approximately five years, including fatality monitoring, ground-level acoustic monitoring and at-height (nacelle) monitoring, to ensure that the system remains effective and continues to protect bat populations under changing environmental conditions. >			
MX35	Biodiversity Enhancement Measures	Chapter 6 Appendix 6-4	Molinia Meadow Enhancement A site-specific monitoring and evaluation programme is necessary to ensure that the success of the proposed measures remains long-term. It will also assist in situations where the habitat enhancement measures may not have been successful by providing evidence of shortcomings, allowing a revised management plan to be formulated. Adaptive management measures will be targeted to address specific issues identified by the ecological monitoring and may be varied. The proposed management actions will be conveyed to each of the	As required	As required	Project Ecologist

			landowners and management alterations implemented by the wind farm operator as required to achieve the targets of the management plan. Measures may include: ➤ Alterations to stocking densities, and/or timing of grazing. ➤ Removal of scrub in areas of excessive scrub encroachment. ➤ Propagation of devil's bit scabious plant through seed collection or green hay strewing from areas where the plant is present on the Site to establish more plants throughout the Site if required. Seed collection will be undertaken outside of areas with marsh fritillary larval webs present. A check list of conditions will be assessed by the appointed ecologist as part of the habitat enhancement monitoring. A series of permanent monitoring plots will be established prior to the commencement of the proposed management regime (i.e. during pre-commencement) and relevés will be undertaken in these throughout the proposed monitoring period. Monitoring should be carried out in late August or early September when devils bit scabious is in flower, and larval webs of the marsh fritillary butterfly are most conspicuous. Conditions assessed will be in reference to the monitoring criteria set out in Martin <i>et al.</i> (2018) for the Annex I habitat <i>Molinia</i> meadows, and the habitat condition assessment criteria set out by NBDC for marsh fritillary¹ and will include as a minimum: ➤ Information on vegetation composition <i>i.e.</i> percentage cover of high quality and positive indicator species, percentage cover of negative indicator species, non-native invasive species, scrub species and bracken present. ➤ Information on vegetation structure <i>i.e.</i> vegetation height, presence of structured vegetation, forb to graminoid ratio.			
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			➤ Information on physical structure <i>i.e.</i> cover of bare ground, presence of invading scrub, degree of poaching or evidence of excessive disturbance by livestock. ➤ Information on the presence and abundance of the devil's bit scabious plant ➤ Information on the presence/absence, and number of occupied larval webs of the marsh fritillary butterfly. Monitoring surveys will also include presence/absence surveys for marsh fritillary within areas that larval webs were identified during the baseline surveys (i.e. those described in Confidential Appendix 6-6). These will be carried out in accordance with best practice guidance (NRA, 2009) and the National Biodiversity Data Centre Marsh Fritillary survey methodologies for larval web surveys¹. The optimum survey period for larvae is during August and September, in sunny conditions. Occupied larval webs will be recorded. Monitoring will be carried out on a yearly basis until the proposed grassland enhancement area has been sufficiently established and has given consistent results for 3 consecutive years after the establishment phase. Once the grassland has been successfully established, monitoring can be carried out every other year (years 5, 7, 10, 15 and 20 post-establishment). During this time the appointed ecologist will ascertain whether the methodology needs to be adapted. Monitoring results will be reported by the appointed ecologist within a Monitoring Report. Any criteria failures will be identified, and corrective actions will be implemented. Reports detailing the monitoring works carried out, the results obtained and a review of their success, along with any suggestions for amendments to the Plan will be prepared.			
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			The results of all monitoring will be made available to the NPWS. The Plan will be regularly updated and amended where necessary to improve the efficacy of the prescribed works. Hedgerow and Treeline Planting and Enhancement Newly planted hedgerows and planted trees will be inspected by the appointed ecologist following the main growing season (i.e. in September) for the first five years of growth, where the requirement for replacement planting will be assessed. If any trees are dead or damaged these will be replaced by the wind farm operator using the same species within the next planting season. Recommendations for ongoing or remedial management required will be specified within a Monitoring Report. Native Woodland Planting Newly planted native woodland will be monitored following the main growing season (i.e. in September) for the first five years of growth, where the requirement for replacement planting will be assessed. If any trees are dead or damaged these will be replaced using the same species within the next planting season. Recommendations for ongoing or remedial management required will be specified within a Monitoring Report.			
MX36	Birds	Chapter 7 Appendix 7-7	Operational monitoring will be undertaken in Years 1, 2, 3, 5, 10 and 15 of the lifetime of the wind farm, following SNH (2009) guidance. The surveys that will be undertaken are: Vantage Point Surveys Collision Searches (Bird Casualties)	As required	As Necessary	Project Ornithologist

			Vantage Point Surveys Vantage point surveys will be undertaken monthly during operational years 1, 2, 3, 5, 10 and 15 of the lifetime of the wind farm. The methodology for vantage point watches will follow guidelines issued by the SNH (2009) and NatureScot (2025). The proposed vantage point watches will adhere to a minimum of 36 hours/VP per season as per guidelines issued by NatureScot. Monthly visits will be undertaken for 12 consecutive months during each monitoring year, with surveys commencing at the start of the breeding season (April) or the start of the winter season (October). During each visit, six-hour vantage point watches will be undertaken from each fixed vantage point location that offers an un-interrupted view of the study area. Vantage points will be undertaken from the same locations that pre-planning surveys which informed the EIAR application of the Proposed Project (i.e. VPs 1 & 2a). Vantage point surveys will be timed to provide a spread over the full daylight period including dawn and dusk watches to coincide with the highest periods of bird activity. Behavioural categories for the observation of bird interactions with operational wind farms will be in line with terminology outlined by Meredith et al., (2002) Collision Searches (Bird Casualties) Carcass searches for bird casualties as a result of collision with turbines will follow survey methods broadly based on guidelines issued by the SNH (2009) and search methods adopted by Duffy and Steward (2008). The study area will be visited once per month during operational Years 1, 2, 3, 5, 10 and 15 of the lifetime of the wind farm. During each visit, the base of each operating turbine will be searched for bird carcasses. The area to be searched will be based on			
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			the turbine size and surrounding landscape. A trained dog and handler should be used to locate carcasses. Edkins (2014) recommends the "search width should be equal to the maximum rotor tip height". Given a turbine rotor tip height 160 meters the search area surrounding the base of the turbine would be taken as a radius of 80 meters centred on the turbine base. This area will be the subject of target searches for bird casualties. Searches will incorporate the use of transects spaced at 10m intervals apart with the observer covering 5m on either side for each transect. If a bird carcass is found, the following details will be recorded: GPS location of each bird carcass, photographic record, carcass condition (intact - carcass that is completely intact or not badly composed; scavenged - evidence that the carcass was fed upon by a scavenger/predator; or feather spot - ten or more feathers indicating predation or scavenging or two or more primary feathers must be present to consider the carcass a casualty), distance from the turbine, date and time. Carcass removal trials and searcher efficiency trials will be undertaken to account for the ability of the dog to find bird carcasses and the likelihood of scavenging of carcasses by animals. This is done to ensure a more accurate estimation of the total number of collision victims. During carcass removal trials, a carcass is placed in a study area periodically and is monitored for a set number of days or until scavengers remove the carcass. A determination on carcass removal is made when no body parts containing flesh or bone or >10 disarticulated feathers can be found. During searcher efficiency trials, a number of carcasses are placed in a study area by one worker, then searched for by the dog later. The result of these trials is a correction factor that can be applied to the results of the carcass searches.			
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MX37	Noise and Vibration	Chapter 12	Post-commissioning operational noise monitoring will be undertaken to demonstrate compliance with the relevant noise criteria. It is common practice to commence surveys within six months of a wind farm being commissioned.	Once within six months	As Required	Noise Consultant

10. PROGRAMME OF WORKS

10.1 Construction Schedule

The construction phase will take approximately 12-18 months to complete from starting on site to the commissioning of the electrical system and export of electricity from site.

The EIAR stipulates that in the interest of breeding birds, construction will not commence during the breeding bird season, which runs from 1st March to 31st August. The EIAR stipulates that construction may commence between September and the end of March, so that construction activities are ongoing by the time the next breeding bird season comes around and can continue throughout the next breeding season.

Works during the construction phase of the development, including delivery of construction materials will generally take place between 7 a.m. and 7 p.m. daily Monday to Saturday with large concrete pours requiring an earlier start when deemed necessary. Delivery of abnormal loads such as turbine tower sections and blades will take place at night outside of peak traffic hours.

The phasing and scheduling main construction task items are outlined in Table 9-1 below.

Table 10-1 Indicative Construction Schedule

		Year 1				Year 2			
ID	Task Name	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Site Health and Safety								
2	Grid Connection								
3	Site Compounds								
4	Site Roads								
5	Substation and Electrical Works								
6	Turbine Hardstands								
7	Turbine Foundations								
8	Backfilling and Landscaping								
9	Turbine Delivery and Erection								
11	Substation Commissioning								
12	Turbine Commissioning								

11. COMPLIANCE AND REVIEW

11.1 Site Inspections and Environmental Audits

Routine inspections of construction activities will be carried out on a daily and weekly basis by the ECoW and the Site Supervisor/Construction Manager to ensure all controls to prevent environmental impact, relevant to the construction activities taking place at the time, are in place.

Environmental inspections will ensure that the works are undertaken in compliance with this CEMP and all other planning application documents. Only suitably trained staff will undertake environmental site inspections.

11.2 Auditing

An Environmental audit will first be carried out prior to the construction phase of the Proposed Project to ensure the implementation of pre-construction mitigation measures, completion of baseline studies and implementation of pre-construction felling mitigation measures. Further environmental audits will be carried on a monthly basis during the construction phase of the Proposed Project and again after the commissioning of the wind turbines and substation.

In contrast to monitoring and inspection activities, audits are designed to shed light on the underlying causes of non-compliance, and not merely detect the non-compliance itself. In addition, audits are the main means by which system and performance improvement opportunities may be identified. Environmental audits will be carried out by the ECoW on behalf of the Project Developer, in an and objective manner. Environmental audits will be conducted at planned intervals to determine whether the CEMP is being properly implemented and maintained. The results of environmental audits will be provided to the Project Developer and Project Contractor.

An audit of compliance with the pre-commencement mitigation measures will be completed by the ECoW prior to the commencement of the construction phase of the Proposed Project. An audit of compliance with the construction phase mitigation measures will be completed monthly during the construction phase. The findings of each audit will be documented by the ECoW within the EMP. The findings of each audit will be made available to Mayo County Council on request.

Once the Proposed Project is operational and turbines have been commissioned, a report of compliance with operational phase mitigation measures will be prepared.

11.3 Environmental Compliance

The following definitions shall apply in relation to the classification of Environmental Occurrences during construction of the Proposed Project:

Environmental Near Miss: An occurrence which if not controlled or due to its nature could lead to an Environmental Incident.

Environmental Incident: Any occurrence which has potential, due to its scale and nature, to migrate from source and have an environmental impact beyond the Site.

Environmental Exceedance Event: An environmental exceedance event occurs when monitoring results indicate that limits for a particular environmental parameter (as indicated in the Environmental Monitoring Programme) has been exceeded.

An exceedance will immediately trigger an investigation into the reason for the exceedance occurring and the application of suitable mitigation where necessary.

Exceedance events can be closed out on achieving a monitoring result below the assigned limit for a particular environmental parameter.

Environmental Non-Compliance: Non-fulfilment of a requirement and includes any deviations from established procedures, programs and other arrangements related to the EMP.

11.4

Corrective Action Procedure

A corrective action is implemented to rectify an environmental problem on-site. Corrective actions will be implemented by the Site Supervisor/Construction Manager, as advised by the Site Environmental Clerk of Works. Corrective actions may be required as a result of the following:

- Environmental Audits;
- Environmental Inspections and Reviews;
- Environmental Monitoring;
- Environmental Incidents; and,
- Environmental Complaints.

A Corrective Action Notice will be used to communicate the details of the action required to the main contractor. A Corrective Action Notice is a form that describes the cause and effect of an environmental problem on site and the recommended corrective action that is required. The Corrective Action Notice, when completed, will include details of close out and follow up actions.

If an environmental problem occurs on site that requires immediate attention, direct communications between the Site supervisor/Construction Manager and the Site ECoW will be conducted. This in turn will be passed down to the site staff involved. A Corrective Action Notice will be completed at a later date.

11.5

Construction Phase Review

The Project Contractor's CEMP will be the subject of review by the ECoW on behalf of the Project Developer whenever a revised version of the CEMP is presented for approval.