



APPENDIX 4-5

**CONSTRUCTION AND
ENVIRONMENTAL
MANAGEMENT PLAN**

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1. INTRODUCTION

This Construction and Environmental Management Plan (CEMP) has been prepared by MKO on behalf of the Applicant, Slieveacurry Ltd. who intends to apply to An Coimisiún Pleanála (ACP) under Section 37E of the Planning and Development Act, 2000, as amended for planning permission to construct a renewable energy development comprising 9 no. turbines and all associated infrastructure in the townland of Glendine North and adjacent townlands, Co. Clare, and a permanent extension to the existing Slievecallan 110kV substation and associated works, including underground 33kV cabling to connect to the national grid at Slievecallan.

As detailed in Section 1.1.2 in Chapter 1, for the purposes of this Environmental Impact Assessment Report (EIAR), the following references are used: 'Proposed Project', 'Site' 'Proposed Grid Connection Site', 'Proposed Wind Farm Site', 'Proposed Turbines' and 'Proposed Enhancement Site'. Please see Section 1.1.2 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 Natura Impact Statement (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 1260 hectares (ha). The Proposed Project layout is illustrated on Figure 2-1 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 approx. 7km south of Ennistimon, Co. Clare and 8km west of Inagh, Co. Clare. The town of Miltown Malbay is located approx. 5.8km east of the nearest proposed turbine (T07). It is proposed to access the Proposed Wind Farm Site via an existing access track off the local road to the northwest of the Site. The Proposed Wind Farm Site is served by a number of existing local, forestry and agricultural roads and tracks. The Grid Reference co-ordinates for the approximate centre of the Proposed Wind Farm Site are 512152, 680174 (ITM).

The planning application includes for an extension to the existing Slievecallan 110kV substation in the townland of Knockalassa, Co. Clare. The planning application also includes for the construction of 33kV underground cabling from the wind farm road to the proposed substation extension. The proposed 33kV underground cabling measures approx. 7.1 km in total and is located on existing forest roads/land, agricultural land and within the public road corridor.

Current land-use on the Site comprises coniferous forestry, agriculture, turf cutting and public road corridor. Land-use in the wider landscape comprises a mix of agriculture, low density housing, renewable energy and commercial forestry.

A full and detailed description of the Proposed Project for the purposes of the planning application assessed in the EIAR, is contained in Chapter 4 of the EIAR.

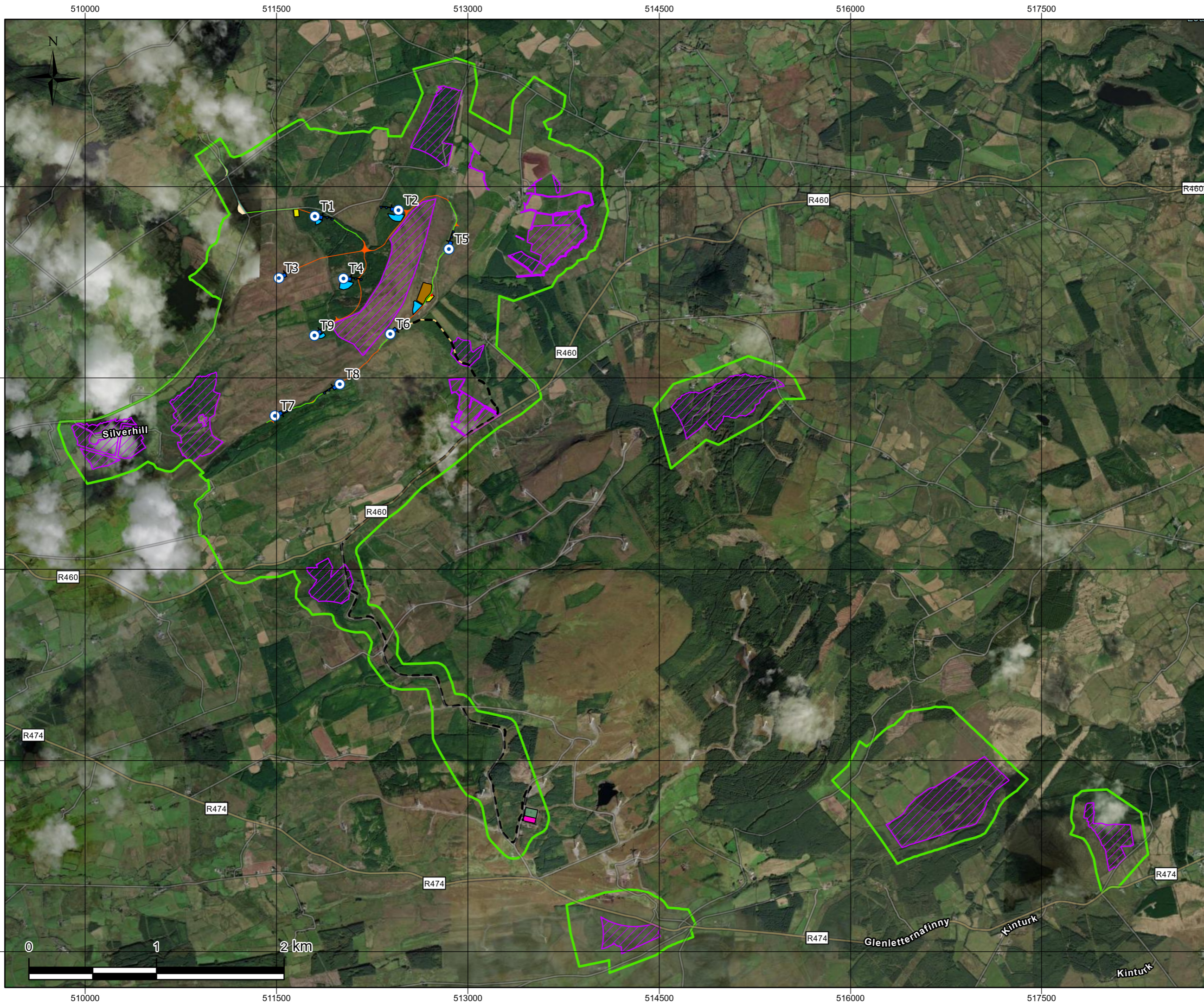
The townlands in which the Proposed Project is located are listed in Table 1-1 in Chapter 1. All townlands are located in Co. Clare.

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.

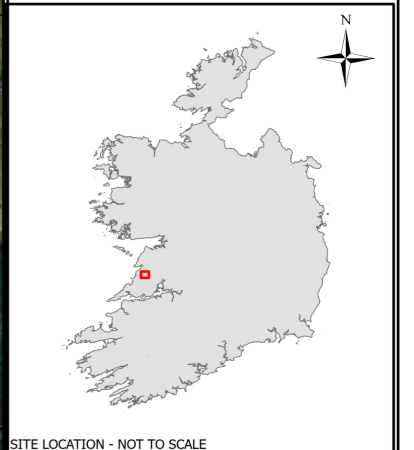
The Site layout is shown in Figure 2-1. The Proposed Wind Farm Site layout is illustrated on Figure 2-2. Figure 2-3 illustrates the Proposed Grid Connection Site. Detailed site layout drawings of the Proposed Project are included in Appendix 4-1 to the EIAR.



Map Legend

- EIA Site Boundary
- Proposed Turbines
- Proposed Turbine Hardstands
- Existing Roads to be Upgraded
- Proposed New Roads
- Public Road to be Upgraded
- Public Road to be Maintained
- Proposed Borrow Pit
- Proposed Temporary Construction Compound
- ▲ Met Mast
- Proposed 33kV Underground Cabling
- Existing Slieveacallan 110kV Substation
- Proposed Extension to Existing Slieveacallan 110kV Substation
- Proposed Access Track
- Proposed Peat and Spoil Management Areas
- Turbine Delivery Overrun Areas
- Proposed Biodiversity Enhancement Areas

Spatial Reference
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 Datum: IRENET95
 Projection: Transverse Mercator

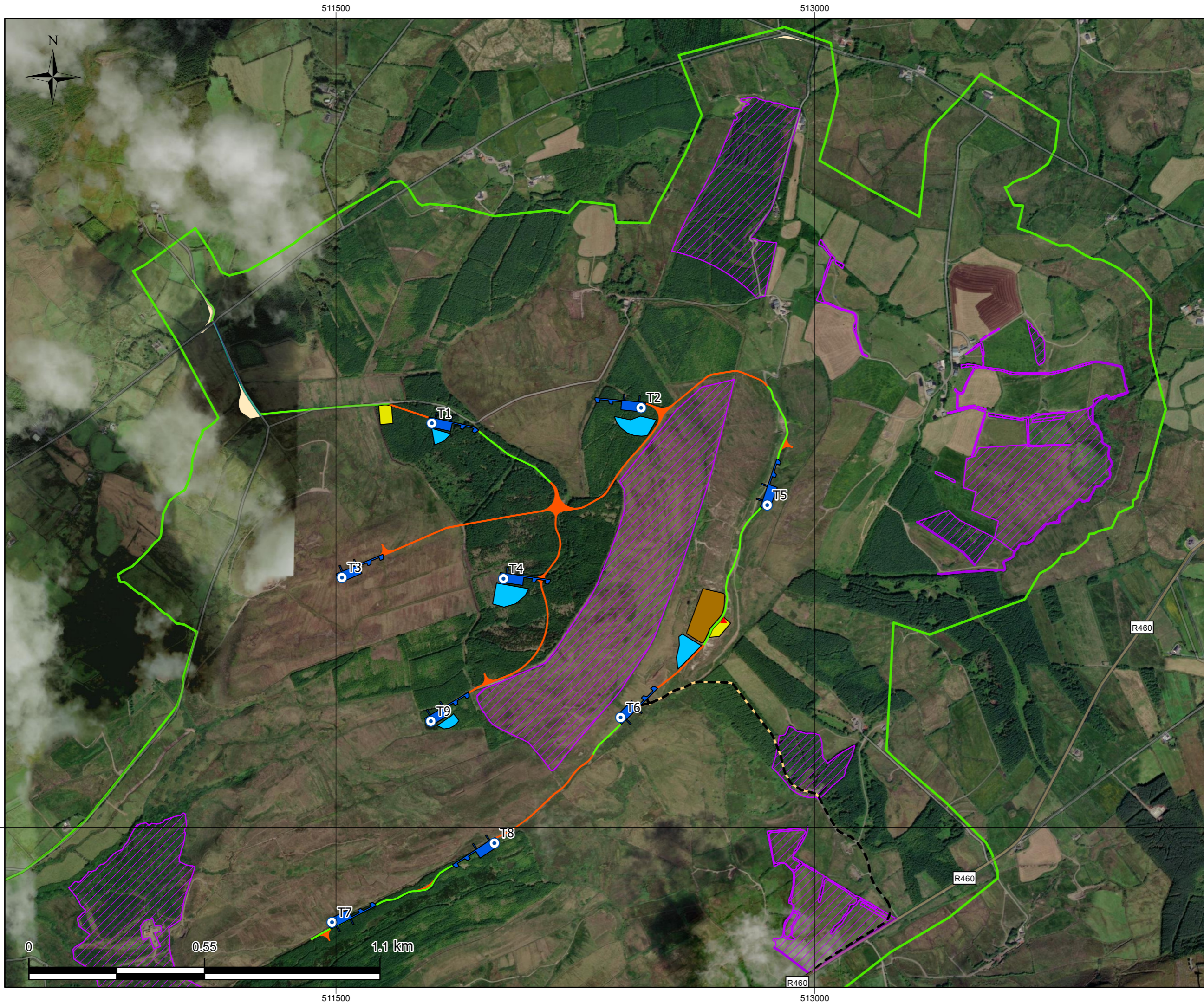


Proposed Project Layout

Project Title
 Slieveacurry Renewable Energy Development Co. Clare

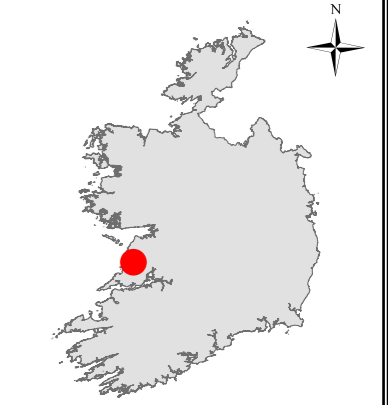
Project No. 240718	Drawing No. 2-1	Scale 1:27,500
Drawn By MVN	Checked By BT	Date 24/04/2026

Email: info@mkoireland.ie / Website: www.mkoireland.ie



- Map Legend**
- EIA Site Boundary
 - Proposed Turbines
 - Proposed Turbine Hardstands
 - Existing Roads to be Upgraded
 - Proposed New Roads
 - Public Road to be Upgraded
 - Public Road to be Maintained
 - Proposed Temporary Construction Compound
 - Proposed Borrow Pit
 - Met Mast
 - Proposed 33kV Underground Cable Connection
 - Proposed Peat and Spoil Management Areas
 - Proposed Access Track
 - Turbine Delivery Overrun Areas
 - Proposed Biodiversity Enhancement Areas

Spatial Reference
 Name: IRENET95 Irish Transverse Mercator
 Datum: IRENET95
 Projection: Transverse Mercator



SITE LOCATION - NOT TO SCALE

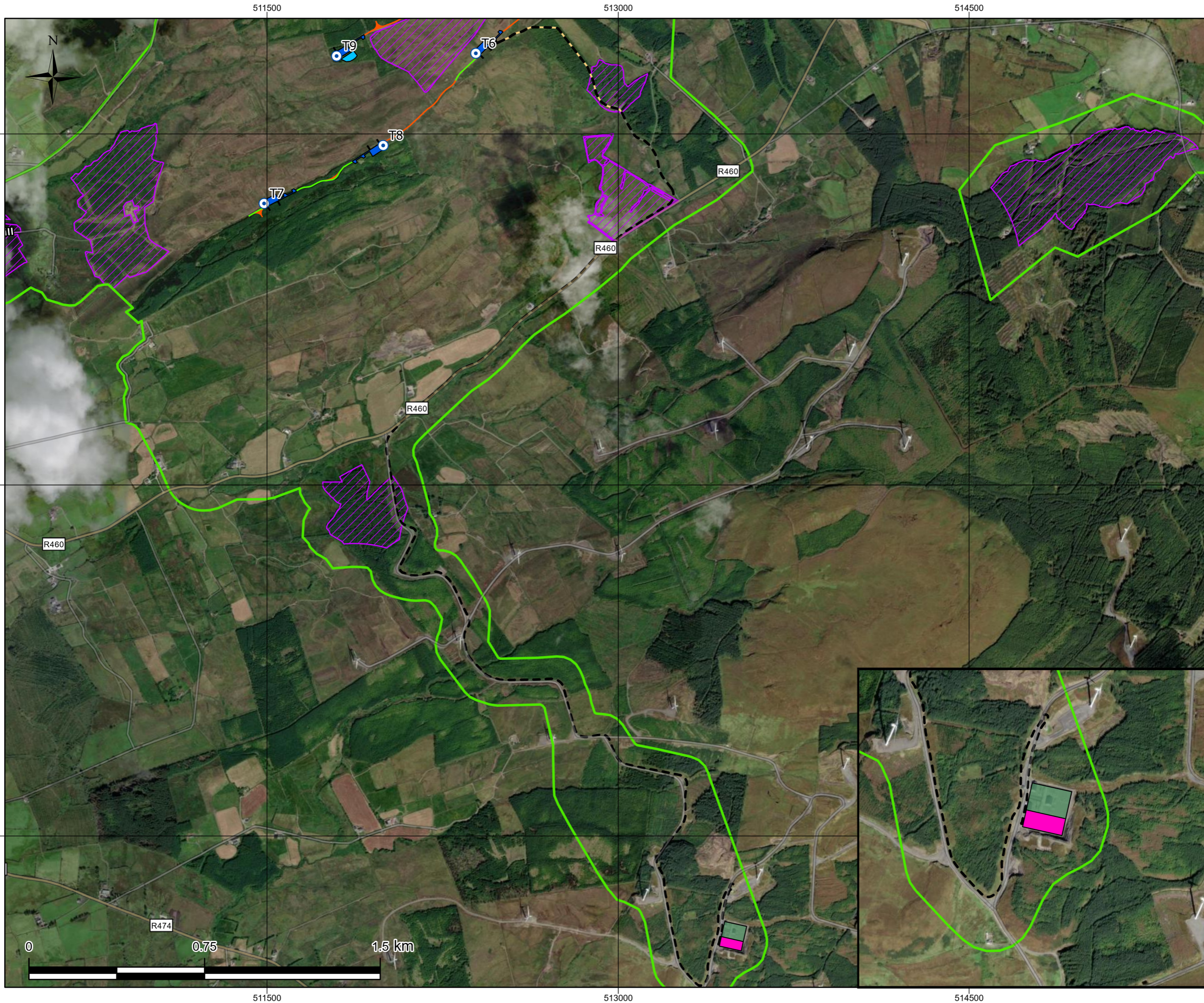
Proposed Wind Farm Site

Project Title
 Slieveacurry Renewable Energy Development Co. Clare

Project No. 240718	Drawing No. 2-2	Scale 1:11,000
Drawn By MVN	Checked By BT	Date 01/05/2026



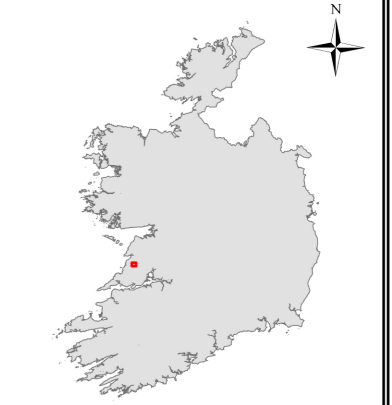
Email: info@mkoireland.ie / Website: www.mkoireland.ie



Map Legend

- EIAR Site Boundary
- Proposed Turbines
- Proposed Turbine Hardstands
- Existing Roads to be Upgraded
- Proposed New Roads
- Proposed Peat and Spoil Management Areas
- Proposed 33kV Underground Cabling
- Proposed Access Track
- Existing Slieveacallan 110kV Substation
- Proposed Extension to Existing Slieveacallan 110kV Substation
- Proposed Biodiversity Enhancement Areas

Spatial Reference
 Name: IRENET95 Irish Transverse Mercator
 Datum: IRENET95
 Projection: Transverse Mercator



SITE LOCATION - NOT TO SCALE

Proposed Grid Connection Site

Project Title
Slieveacurry Renewable Energy Development Co. Clare

Project No.	Drawing No.	Scale
240718	2-3	1:15,000
Drawn By	Checked By	Date
MVN	BT	24/04/2026



Email: info@mkoireland.ie / Website: www.mkoireland.ie

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 Project

- Turbine and Meteorological Mast Foundations
- Turbine Hardstanding Areas;
- Meteorological Mast Foundation;
- Site Roads (New and Upgrade to existing tracks);
- Site Drainage System;
- Site Entrance Management;
- Watercourse/Culvert Crossings;
- Peat and Spoil Management Areas;
- Temporary Construction Compounds;
- Biodiversity Management and Enhancement Measures;
- Tree Felling and Replanting;
- Borrow Pit
- Underground Electrical (33 kV) and Communication Cabling;
 - Existing Underground Services;
 - Joint Bays/Pits;
 - Underground Cabling Watercourse/Culvert/Service Crossings
- Extension to existing Slievecallan 110kV substation

2.3.3 Turbine and Meteorological Mast 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 4m respectively. Where ground conditions are unfavourable to excavate and replace, piles will be installed to formation level.

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.

It is anticipated that 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 Proposed Wind Farm Site with excavated peat and spoil being transported to the identified peat and spoil management areas within the Proposed Wind Farm 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 Proposed Wind Farm Site with excavated peat and spoil being transported to the identified peat and spoil management areas within the Site.*

Reinforced concrete piled foundations will be completed 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. *No excavated material will be removed from the Proposed Wind Farm Site with excavated peat and spoil being transported to the identified peat and spoil management areas within the Site.*
3. *A piling platform for the piling rig will be constructed by excavating to a suitable intermediate mineral subsoil and backfilling to formation level by compacted layers of well graded granular material spread and compacted to provide a hard area for the piling rig;*
4. *The piling rig, fitted with an auger, will then bore through the soft material with a sleeve fitted around the auger to prevent the sidewalls of the soil and overburden from collapsing. The borehole is then extended to a suitable depth into the subsoil/bedrock.*
5. *When the auger and the sleeve are removed high tensile steel cages will be lowered into the boreholes. These steel cages will extrude above the level of the top of the concrete pile.*
6. *As the auger is removed concrete is pumped into the borehole.*
7. *Reinforcing steel on the top of the pile will tie to the foundation base steel.*
8. *The procedure for standard excavated reinforced concrete bases as outlined above can be applied form here.*

2.3.3.1 Turbine Hardstanding Areas

Hardstand areas consisting of levelled and compacted hardcore are required around each turbine base to facilitate access, turbine assembly and turbine erection. The hardstand 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 hardstand 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 crane hardstands will be constructed in a similar manner to the excavated site roads and will measure approximately 50m x 30m.

The precise sizes, arrangement and positioning of hard standing areas are informed by the turbine manufacturers. The extent of the required areas at each turbine location may be optimised on-site depending on topography, position of the Proposed Wind Farm Site access road, the proposed turbine position and the turbine supplier's exact requirements.

2.3.3.2 Meteorological Mast Foundation

One meteorological (met) mast is proposed as part of the Proposed Project. The met mast will be equipped with wind monitoring equipment at various heights. The proposed met mast will be located at E512714, N680150 (ITM) as shown on the Site layout drawing in Figure 2-1 above and the detailed site layout drawings included as Appendix 4-1. The met mast will be a free-standing slender lattice structure 30m in height. It will be constructed on a hardstanding 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 4-12 in 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:

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 met mast;*

3. *No material will be removed from the Proposed Wind Farm Site with excavated Peat and spoil being transported to the identified peat and spoil management areas within the Site.*
4. *All groundwater and surface water arising from met mase 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 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.

2.3.4 Road Construction Types

To facilitate access within the Proposed Wind Farm Site and to connect the wind turbines and associated infrastructure, existing roads and tracks will need to be upgraded, and new access roads will need to be constructed. The Proposed Wind Farm Site makes use of the existing road network insofar as possible. The road construction techniques to be considered are as follows:

- Upgrades of Existing Access Roads – Type A and B
- Construction of New Excavated Roads through Peat – Type C/E
- Construction of New Floated Roads Over Peat – Type D

Upgrades of Existing Access Roads - Type A and B

1. *Access road construction shall be to the line and level requirements as per design/planning conditions*
2. *For upgrading of all existing founded access roads (Type A/A1) the following will apply:*
 - a) *Excavation of the access road 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 road and the widened section of access road where the depth of excavation exceeds 500mm.*
 - c) *For a founded access road, the surface of the existing access road will be overlaid with an average of 500mm of selected granular fill.*
 - d) *Access roads will be finished with a layer of capping across the full width of the road.*
 - e) *A layer of geogrid/geotextile may be required at the surface of the existing access road where the existing roads 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.*
3. *For upgrading of existing access roads constructed using a floated construction technique (Type B) the following will apply:*
 - a) *Prior to commencing floating road construction movement monitoring posts will be installed in areas where the peat depth is greater than 2m and will be placed at 10m intervals along these sections.*
 - b) *Upgrading of existing access roads will be in accordance with appropriate design from the designer.*

- c) *The surface of the existing access road will be graded/tidied up prior to the placement any geogrid/geotextile, where necessary (to prevent damaging the geogrid/geotextile).*
 - d) *Where granular fill has been used in the existing access road make-up, a layer of geogrid will be placed on top of the existing access road.*
 - e) *The basal geogrid on the widened section will be overlaid with an average of 1000mm of selected granular fill.*
 - f) *Additional geogrid and granular fill may be required in certain sections of the works, such as where excessive rutting is noted in the existing road (to be confirmed by the designer)*
 - g) *Stone delivered to the floating road construction will be end-tipped onto the constructed floating road geogrid. Direct tipping of stone onto the peat will not be carried out.*
 - h) *To avoid excessive impact loading on the peat due to concentrated end-tipping all stone delivered to the floating road will be tipped over at least a 10m length of constructed floating road.*
 - i) *Following the detailed design of the floated access roads it may be deemed necessary to include pressure berms either side of the access road in some of the deeper peat areas. The inclusion of a 2 to 5m wide pressure berm (1.0m in height) either side of the access road will reduce the likelihood of potential bearing failures beneath the access road.*
 - j) *Following end-tipping suitable machinery will be employed to spread and place the tipped stone over the base geogrid along the line of the road*
4. *At transitions between upgraded floating and existing/upgraded excavated roads a length of about 10m shall have all peat excavated and replaced with suitable fill, with the geogrid extended into this fill. The surface of this fill shall be graded to accommodate wind turbine construction and delivery traffic.*
 5. *The finished road width will have a running width of 5m, with wider sections on bends and corners.*
 6. *On side long sloping ground any road widening works required will be done on the upslope side of the existing access road.*
 7. *A final surface layer shall be placed over the existing access road, as per design requirements, to provide a road profile and graded to accommodate wind turbine construction and delivery traffic.*
 8. *The construction of access roads 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.*

Construction of New Excavated Floating Roads through Peat – Type C/E

1. *Prior to commencing the construction of the excavated roads, 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 Geotechnical & Peat Stability Assessment, FT, 2026) as requiring monitoring.*
2. *Interceptor drains will be installed upslope of the access road alignment to divert any surface water away from the construction area.*
3. *Excavation of roads will be to the line and level given in the design requirements. Excavation will take place to a competent stratum beneath the peat.*
4. *Road construction will be carried out in sections of approximately 20m lengths i.e. no more than 20m of access road will be excavated without replacement with stone fill.*
5. *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 placement areas or the borrow pit.*
6. *Once excavated, non-catotelm peat will be temporarily stored in localised areas adjacent to excavations for roads and hardstands before being placed into the permanent peat storage areas within the borrow pit, at the designated peat storage areas or reused for landscaping purposes. All peat placement areas will be upslope of founded roads/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 roads.*
 7. *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.*
 8. *End-tipping of stone onto the road during the construction/upgrading of the access road will be carefully monitored to ensure that excessive impact loading, which may adversely affect the adjacent peat, is limited.*
 9. *The excavated access road will be constructed with an average of 750mm of selected granular fill. Granular fill to be placed and compacted in layers in accordance with the TII Specification for Road Works.*
 10. *Access roads will be finished with a layer of capping across the full width of the road.*
 11. *A layer of geogrid/geotextile will be required at the surface of the competent stratum, where this stratum is cohesive in nature.*
 12. *Where slopes of greater than 5 degrees are encountered along with relatively deep peat (i.e. greater than 1.5m) and where it is proposed to construct the access road 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.*
 13. *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 road, 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 Section 10) will also be installed downslope of the works area to allow for ongoing monitoring during the construction works.*
 14. *A final surface layer will be placed over the excavated road and graded to accommodate wind turbine construction and delivery traffic.*
 15. *The construction and upgrading of access roads 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.*

Construction of New Floated Roads Over Peat – Type D

1. *Prior to commencing floating road construction movement monitoring posts will be installed in areas where the peat depth is greater than 2m.*

2. *Base geogrid will be laid directly onto the existing peat surface along the line of the road in accordance with geogrid provider's requirements.*
3. *The typical make-up of the new floated access road will be up to 1,000mm of selected granular fill with 2 no. layers of geogrid with possibly the inclusion of a geotextile separator.*
4. *Granular fill to be placed and compacted in layers in accordance with the TII Specification for Road Works, Series 600 (2024).*
5. *Following the detailed design of the floated access roads it may be deemed necessary to include pressure berms either side of the access road in some of the deeper peat areas. The inclusion of a 2 to 5m wide pressure berm (typically 1.0m in height) either side of the access road will reduce the likelihood of potential bearing failures beneath the access road.*
6. *The finished road width will be approximately 5m, with wider sections on bends and corners.*
7. *Stone delivered to the floating road construction will be end-tipped onto the constructed floating road. Direct tipping of stone onto the peat will not be carried out.*
8. *To avoid excessive impact loading on the peat due to concentrated end-tipping all stone delivered to the floating road will be tipped over at least a 10m length of constructed floating road.*
9. *Where it is not possible to end-tip over a 10m length of constructed floating road then dumpers delivering stone to the floating road 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 road.*

2.3.5 Site Drainage System

The early establishment of the drainage system will manage the risk of impacts on watercourses on and adjacent to the Site during construction. In addition, construction operations will adopt best working practices, and the development of the Site will be phased accordingly.

The EIAR (and appended drawings) includes a drainage design required for the purposes of assessing the potential effects of the Proposed Project. The drainage design will be developed further with a level of construction detail necessary to implement the measures onsite. The detailed (construction phase) drainage design will form part of the updated Main Contractor's CEMP, and the effective implementation of the detailed drainage design will be audited by the ECoW. Surface water management and drainage design principles are outlined in Section 3.2.2 below, Chapter 4 Section 4.7.3 and Appendix 4-7 Surface Water Management Plan of the EIAR.

2.3.6 Site Entrance Management

Construction and Operational Site Entrance

It is proposed to access the Proposed Wind Farm Site via an existing access track off the L6230 local road to the northwest of the Proposed Turbines. This entrance will be widened to facilitate the delivery of the construction materials and turbine components and used during both the construction and operational phase of the Proposed Project. Appropriate sightlines will be established at the Proposed Wind Farm Site entrance for the safe egress of traffic during the construction phase. Temporary overrun areas will be constructed to facilitate delivery of oversized loads during the construction phase. On completion of the construction phase, the site entrance will be reduced in size and gated for security with the original roadside boundary reinstated either side of the gate, and will be used as the operational phase entrance to the Proposed Wind Farm Site.

2.3.7 Watercourse/Culvert Crossings

2.3.7.1 Proposed Wind Farm Site

To facilitate the construction of the Proposed Wind Farm Site roads, there are a total of 5 no. new watercourse crossing locations over natural watercourses (rivers and streams). The crossing locations are outlined below:

- > West of T01
- > Access road to T03
- > Access Road to T02
- > Access Road to T04
- > Access Road to T09

Within the Proposed Wind Farm Site, there is 1 no. existing natural watercourse crossings that will require upgrading to facilitate the construction of site roads east of T01. The crossing locations are as follows:

In addition to the natural watercourses, there are manmade agricultural, peat and forestry drains within the Proposed Wind Farm Site, which will rerouted around the Proposed Wind Farm infrastructure and/or integrated into the proposed drainage design as required.

Bottomless Box Culvert Crossing

It is proposed to construct a bottomless box culvert crossing at the 5 no. locations where new watercourse crossings are required within the Proposed Wind Farm Site. The locations of these crossings are shown on the layout drawings included in Appendix 4-1. The bottomless box culvert crossing methodology presented below will ensure that no instream works are necessary. The standard construction methodology for the installation of a bottomless box culvert crossing is as follows:

1. The access road on the approach either side of the watercourse will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of each watercourse crossing.
2. All drainage measures along the proposed road will be installed in advance of the works.
3. A foundation base will be excavated to rock or competent ground with a mechanical excavator with the foundation formed in-situ using a semi-dry concrete lean mix. The base will be excavated along the stream bank with no instream works required.
4. Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of a temporary pre-cast concrete bridge across the watercourse to provide temporary access for the excavator. Plant and equipment will not be permitted to track across the watercourse.
5. Once the foundation base has been completed, the pre-cast bottomless culvert will be installed using a crane which will be set up on the bank of the watercourse and will be lifted into place from the bank with no contact with the watercourse.
6. Once the crossing is in position stone backfill will be placed and compacted against the structure up to the required level above the foundations.
7. Underground cabling ducting will be contained within the road make-up of the proposed crossing.

A standard design drawing of a pre-cast concrete, bottomless box culvert crossing is shown in Chapter 4 Figure 4-31.

The watercourse crossing will be constructed to the specifications of the OPW bridge design guidelines '*Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent*

under Section 50 of the Arterial Drainage Act, 1945', and in consultation with Inland Fisheries Ireland. Abutments will be constructed from precast units combined with in-situ foundations, placed within an acceptable backfill material.

Confirmatory inspections of the proposed new watercourse crossing locations will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.

Culvert Crossing

All new proposed culverts and culvert upgrades at drain crossings required for the Proposed Project will be suitably sized for the expected peak flows in the watercourse. 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 roadway 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 road 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 Chapter 4 Figure 4-21 of the EIAR for details.

2.3.8 Peat and Spoil Management Areas

Peat and spoil will be managed locally within the Proposed Wind Farm Site, in dedicated peat and spoil management areas as shown on Figure 4-2 of Chapter 4 in the EIAR. The placement of peat and spoil within the peat and spoil management areas will be undertaken as follows:

- (1) *Excavated peat will be placed/spread across the clearfell areas around 4 no. of the Proposed Turbines.*
- (2) *The peat placed will be restricted to a maximum height of 1.2m. Any weak/liquified peat (if any is encountered) will be placed within the proposed borrow pit and not stored within these areas. Spoil will be placed to a height of 1.5m in the spoil management area adjacent to the borrow pit.*
- (3) *The placement of peat within the placement areas will require the use of long reach excavators and low ground pressure machinery in particular for drainage works.*
- (4) *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 placement area progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability of the placed peat.*
- (5) *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.*
- (6) *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 placement areas.*
- (7) *Movement monitoring instrumentation will be placed around the areas where peat has been placed. The locations where monitoring is required will be both upslope and downslope of the peat storage areas and should be monitored on a weekly basis during construction.*

- (8) *Supervision by the Project Geotechnical Engineer will be undertaken during the works.*
- (9) *An interceptor drain will be installed upslope of the designated peat placement 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.*
- (10) *All the above mentioned general guidelines and requirements will be undertaken by the Contractor during construction.*

All the above-mentioned commitments will be undertaken by the Contractor during construction.

2.3.9 Temporary Construction Compounds

The temporary construction compounds will be constructed as follows:

- 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 in the northern section of the Proposed Wind Farm Site will be established using a similar technique as the construction of new floated road (Type D) as discussed above;
- The compound platform to the southwest of T05 will be established using a similar technique as the construction of new excavated roads (Type C) as discussed above;
- A layer of geo-grid will be installed 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;
- Areas within the compound will be constructed as site roads and used as vehicle hardstandings during deliveries and for parking;
- The compounds 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.
- A section of the temporary construction compound to the southwest of T05 will be repurposed to facilitate the construction of the meteorological mast.

2.3.10 Biodiversity Management and Enhancement Measures

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

A total of 13 areas totalling approx. 172.7 ha within the Site have been selected for biodiversity enhancement measures as part of the Proposed Project and to enhance the Site for species and habitats known to occur within the Site. An overview map of the Proposed Enhancement Site is shown in Appendix 6-4 Figure 4-1 of the EIAR.

2.3.10.1 Hen Harrier Habitat Enhancement

2.3.10.1.1 Deforestation Measures

In summary, Areas A, B, C, D, E, F, G, H, I, and J are comprised of conifer plantations ranging from immature to mature to recently felled. Additional measures within Areas F and G are proposed which aim to restore blanket bog habitat using appropriate and proven 'forest to bog' methodologies, see Section 4.4 of Appendix 6-4 for further details. Sections within the forestry plantation of Area B included powerline setbacks which had species compositions which were characteristic of upland blanket bog. There are also areas of dense conifer plantations, with sitka spruce (*Picea sitchensis*)

dominating these areas. Gaps in these dense plantations come in the form of access paths and fire breaks allowing light and in turn more plant growth in some sections. Management prescriptions to be implemented by the applicant include:

- The identified area of existing forestry will be permanently removed. The timber, brash and stumps will be collected and removed off-site. The area will be allowed to revert to peatland habitat. This process will be aided by drain blocking as discussed below. This will create suitable foraging habitat for hen harrier and its associated prey species. Pre-mature felling of forestry will be undertaken before the first breeding season of the construction phase of the project programme. This will allow time (i.e. min. three growing seasons) for the clear-felled site to revegetate in advance of the operational phase, thereby ensuring replacement habitat would be available should the predicted displacement effect occur.
- A hydrology/hydrogeology study will be undertaken to map the movement of ground and surface water to inform the requirement for drain blocking. Forestry drainage channels will be blocked where necessary, using peat dams or plastic dams, as appropriate. In flat areas drain blocks will be placed every 15 meters and more frequently when accounting for a slope. When drains are blocked this reinstates the waterlogged conditions which are crucial for the survival of peatland plants. These works will be subject to a separate planning application if required.
- Self-seeding conifers originating as windblown seedlings from adjacent and nearby commercial conifer plantations, are a threat to the viability of the enhancement areas. They gradually take hold, and if unmanaged, would eventually make the area unsuitable for nesting/foraging hen harrier. Habitat maintenance of the area will involve the eradication of self-seeding conifers, and removal off-site. It is envisaged that the forestry areas will require maintenance twice during the life of the Proposed Project, once after approximately 10 and 20 years. The monitoring outlined in Section 5 below will monitor the level of encroachment by self-seeding conifers and will bring the scheduled removal forward as required.
- In the event of any invasive species being recorded within the Proposed Enhancement Areas, an invasive species management plan will be put in place to eradicate any stands of such species.
- Herbicides will not be used for the eradication of self-seeding trees and will not be relied upon for the clearance of invasive species.
- Enhancement and maintenance works will be undertaken outside of the nesting season as per the Wildlife Acts 1976 – 2023 as amended. A suitably qualified ornithologist will be present at the removal of all woody vegetation, to ensure that identified breeding bird sites are avoided. If breeding activity of birds of high conservation concern is identified, no works shall be undertaken within a species-specific buffer (as per Goodship and Furness, 2022) in line with best practice, until it can be demonstrated that the nest is no longer occupied.
- The felling license for these lands will be applied for in tandem with the felling license application that will be required to facilitate the construction of the built infrastructure of the Proposed Project. The felling license will include management prescriptions for the felling of the forestry. Following felling, these enhancement lands will be managed for the benefit of hen harrier and peatland restoration.
- If at any point, hen harrier are identified to be nesting on any part of the Proposed Hen Harrier Habitat Enhancement Areas, the Applicant, in cooperation with the individual landowner, will provide for the protection of the nest site.
- The use of poisons or stupefying bait is not permitted within the Proposed Enhancement Habitat Enhancement Areas. Hen harriers and other birds of prey can fall victim to secondary and direct poisoning.

2.3.10.1.2

Creation of Patchy Scrub Habitat

Areas of patchy scrub will be planted within Areas A, B, C, D, E, F, G, H, I, and J in order to create a diversity of vegetation structures to provide cover and resources for hen harrier prey species.

- Scrub patches will be planted using a mix of bare-root saplings and 2-3 year old potted trees to provide some structural diversity and to maximise establishment success.

- Areas for planting will measure approximately 0.2ha in size and not exceed 10% of the total area of each area. The scrub will be distributed throughout the deforestation areas.
- Patches of existing native scrub remaining post- deforestation will be targeted for reinforced through planting.

The following species, which are present locally and are suitable for the upland exposed location with peat soils, will be used:

- Grey willow (*Salix cinerea*)
- Birch (*Betula pendula*)
- Alder (*Alnus glutinosa*)
- Hawthorn (*Crataegus monogyna*)
- Blackthorn (*Prunus spinosa*)
- Holly (*Ilex aquifolium*)
- Hazel (*Corylus avellana*)
- Elder (*Sambucus nigra*)
- Rowan (*Sorbus aucuparia*)

2.3.10.2 Management of Farmland for Hen Harrier

2.3.10.2.1 Grazing Regime

Habitat management prescriptions for wet grassland and peatland are outlined below:

- In general, maintain stocking levels of no greater than 0.15 livestock units (LU) per forage hectare;
- Participating landowners will remove any self-seeding conifers as they appear or as they are noticed and can also be removed by the Applicant as provided for in the farm plan agreements.
- On areas of wet grassland, the application of chemical or organic fertiliser will be prohibited;
- All rhododendron or other invasive species must be removed in Year 1 of the plan. Ongoing control will be required in each subsequent year. Acceptable control methods are cutting/pulling;
- Consideration will be given to the creation of shallow pools 30- 50 cm deep to provide spawning sites for amphibians; and
- In cases where the land is wet, concentrate grazing during the summer months.

2.3.10.2.2 Rush Management

Habitat management prescriptions to be included in the farm management plan for managing rushes on wet grassland are outlined below:

- In general, rushes will be cut on a 2-year cycle unless there are specific reasons for a longer cycle, e.g. weak rush growth.
- In most cases, active rush management will commence in Year 1 of the plan and should only be delayed until Year 2 or 3 where improved grassland is in reversion, where rush growth is very weak or where the rushes were cut or treated with herbicide in the year prior to joining the scheme.
- On farms with a large area of rushy wet grassland (> 10 hectares), active rush management can be delayed on a portion of the area until Year 2 of the farm plan. The area where active rush management is to be delayed for this reason should not normally exceed 50% of the wet grassland component of the farm.
- The planned rush management will be reviewed on an annual basis to determine if it is having the desired effect. If it is found during an annual inspection that

rush recovery has been stronger or weaker than had been originally anticipated, the farm plan will be changed to adjust the cutting sequence for future years and provisions for these amendments will be included in the farm plan management agreements. These details have been consented to by the consenting landowners.

2.3.10.2.3 **Delayed Topping/Mowing**

Topping or mowing will not be carried out during the period 1 March – 31 August inclusive to avoid disturbance and mortality or injury of ground-nesting bird species and other wildlife. The availability of tussocky rushes and multi-layered swards is key to supporting the prey species of birds and small mammals favoured by hen harrier. However, individual landholdings may be allowed, on the advice of the ecologist and agricultural advisor, to top or mow grasslands during the period referenced above. Any such allowance/deviation would be written into the Farm Plan.

2.3.10.2.4 **Reduction/Cessation of Fertiliser Application**

The requirements for reduction or cessation of the application of fertilisers will be determined by soil testing and survey carried out by the agricultural advisor to inform the individual farm plan. This measure will aim to increase the species and structure diversity of the grassland sward through reduced nitrate application. This measure will also assist in meeting the requirements of the Nitrates Directive and improve the quality of surface water run-off to streams and drains locally.

2.3.10.3 **Marsh Fritillary Enhancement**

2.3.10.3.1 **Wet Grassland Management**

The measures provided in Section 4.2 of Appendix 6-4 of the EIAR provides for the management of 19.9 ha of existing farmland (Areas 1 and Area 2) into more species diverse/rich Wet grassland (GS4) habitat, which will also promote supporting habitat for marsh fritillary.

During the surveys undertaken, the larval food plant of marsh fritillary, Devils-bit scabious, was frequently recorded within these agricultural grasslands, and therefore, provided the management measures in Section 4.2.3 of Appendix 6-4 of the EIAR are implemented, suitable habitat for this species will be established once a varied sward of between 12 and 25cm in height is achieved.

2.3.10.3.2 **Adaptive Grazing Regime**

It is proposed implement an adaptive grazing regime which will be informed by annual monitoring of Area 3, increasing or decreasing grazing as required.

The following management regime of Area 3 will be implemented, to promote suitable sward structure for marsh fritillary:

- Sheep grazing is unsuitable as they will graze selectively for flowers. Enhancement areas will be grazed by cattle.
- Supplementary feeding to be only provided outside of the enhancement area.
- Use a low stocking level of approx. 0.5LU/ha¹. However, the stocking rate is to be subject to annual monitoring and altered as required. The goal is to have a structured sward between 12 and 25cm in height. Extensive (but non-intensive) grazing will result in areas that look under grazed, but which are used for basking adults.
- No fertiliser, slurry, herbicide, pesticide usage

¹ Byrne, Dolores and Moran, James (2018). *Best practice guidelines for managing lowland species-rich grasslands and marsh fritillary grassland habitat in north-west Ireland. Report prepared for the European Commission, DG Environment, Agreement No. 07.027722/2014/697042/SUB/B2.*

- No reseeding with perennial rye grass
- 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

2.3.10.4 Peatland Habitats

The methodology followed to undertake this blanket bog restoration is described below

2.3.10.4.1 Tree Felling

Felling will be undertaken as set out in Section 2.3.10.1.1 above. Timber and brash will be gathered and removed from the Proposed Enhancement Site in line with best practice. Windrow is not considered suitable for the blanket bog restoration area, as best practice guidance recommends that brash recovery is particularly important in water quality sensitive catchments (2026). Brash mats may be left in place to facilitate access for restoration activities.

The machine operators used will be experienced at working on deep peat and made aware of the specific risks on the Proposed Enhancement Site. The Proposed Enhancement Site will be walked before commencement of works. On wet parts of the bog, the excavator may need to travel on bog mats.

2.3.10.4.2 Furrow and Drain Blocking

The first action will be to effectively block direct connection between the restoration works and the watercourse within Area F. Any collector artificial drains (interceptor drains) that provide connection to the watercourse will be blocked to prevent run off of suspended solids or other pollutants. These measures will take the form of peat dams where there is no flow (as is the case in the vast majority of drains/furrows) and check dams, if any flowing drains are encountered. The restoration works will then commence upslope at the highest point and work systematically downslope towards the natural watercourse.

Given the topography and small size of drains and furrows, it is likely that surface smoothing will be the main action undertaken (see description below). However, if it becomes apparent, following felling, that additional drain blocking is required, this will be undertaken as necessary following the procedures provided below.

Peat Dams

Given the topography of the Site and nature of the drains, it is likely that, if dams are required, they will be peat dams as opposed to plastic dams that would be required on sites with higher flows and gradients and where there is no other option. Construction of peat dams will be achieved using a low ground pressure excavator with a moderate to long bucket reach to reduce movements.

Method:

1. Remove the turfs from the surface of the in ditch borrow pit and the dam location, and place to the side.
2. Clean out/push away from dam location the unconsolidated peat and debris.
3. Key the dam into the sides of the ditch, with a 0.5 to 1 m indent on both sides.
4. Use consolidated peat from an in-ditch borrow pit upstream to create the dam. Avoid leaving steep sided or deep holes behind the dam, as these can be dangerous to stock.
5. If necessary, shallow swales that extend out (or on one side) from behind the dam can be added to re-direct water from the ditch line.
6. Regularly compact the peat in the dam with the back of the excavator bucket to ensure an effective seal.

7. *When the dam is 50 cm above the surface place the vegetation turfs across the top of the dam (and in swale if present) and press with the bucket to ensure good contact between the turf and the peat.*

Timber may be used in conjunction with peat dams to block small drains and furrows.

Plastic Dams

It is unlikely that the use of plastic dams will be required. However, this section provides the proposed methodology for the installation of plastic piling dams on ditches less than 1.5m wide – should it be required. Plastic piling is light, versatile and slots together on site. If properly installed, plastic piling dams can form a good watertight seal that will last for decades. Generally, dams are placed at between 10 and 20 m intervals on flat ground but would need to be closer where there is a slope. It is expected that the final water level from the lower dam will rise half way up the upstream dam. The final water level to be at the peat surface or no more than 20 cm below the surface. Plastic piling dams will be used in the following situations:

- On ground that is too soft and/or unstable to allow safe machine access.
- On portions of the site that are inaccessible by machine.
- On active drains that are partially infilled with vegetation yet hold too much water to allow effective installation of peat dams.

The methodology for the installation of plastic dams is provided below:

- Hammer piles in starting from the centre of the ditch
- Position the longest pile in the deepest part of the drain. Use a sharp spade to pre-cut the outline of each pile in the surface vegetation. Push the pile into the peat using your own weight.
- Ensure that the piles remain vertical as it will become increasingly difficult to insert piles if they lean in any direction. Using a mel, drive further and when firm guide adjacent piles into their cams, repeating the process. Continue until all piles are firm in the peat.
- Piling will only create a good seal if driven into at least 75 cm of solid peat, usually found below the 50 cm of soft peat in the base of the ditch.
- The top edge of the pile may require shielding from the metal of the hammer. Several methods are used but the most effective is a timber batten resting on the pile.
- Shape the dam to form a gently curving upstream 'C' shape at the ends. This shape assists dam strength and increases the amount of water retained. The dam must extend well into the banks of the ditch. A rule of thumb is the extensions into the bank on each side, equal the width of the ditch. On slopes, the wings of the dam can be angled down the slope to re-distribute water over the site and reduce pressure behind the dam.
- Continue driving the piles starting at the centre, until all piles are approximately 30 cm above bank level. Leave the dam to fill with water, as the last firming is best done with water behind the dam to lubricate the piles. Finally, hammer the piles until they sit no more than 10 cm above the ground surface. The dams are not to be visible above the vegetation. If they are too high after installation, then the tops of the piling will be trimmed off to make sure that the dams blend in with the landscape. Do not hammer the piles below the ground level, as this reduces the amount of water held and spread across the adjacent peatland.

2.3.10.4.3

Stump flipping and Surface Smoothing

Surface smoothing and stump flipping is likely to be the primary restoration activity undertaken in the blanket bog restoration site. Bog restoration techniques must reverse the impact of the ridge-furrow cultivation process which continues to persist post-felling, as well as raising the bog water table within the underlying peat mass which have been damaged by the afforestation process. Methods comprising

various surface smoothing techniques, and furrow/drain blocking or a combination of both have shown good results in restoring active blanket bog habitat. A variety of techniques can be used depending on the site conditions.

The key principles are 'enough and no more' and aim to minimise compaction and disturbance. Mitigation measures to manage surface run-off (particularly water quality) from restored sites may be necessary, depending on the method used, site conditions and sensitivity of receptors. Research in Scotland shows a clear differentiation between ridge-furrow original surface in terms of depth to water table and therefore rates of recolonisation of specialist bog species to post felling sites. Leaving furrows untreated may allow bog vegetation to colonise them over time, but the prospects for expanding cover of bog vegetation onto plough shoulders (the original surface level) and then to ridges seems very poor and the process would likely take a very long time. Plough ridges often occupy up to 50% of the plantation surface area.

Surface smoothing is the process where the ridge and furrows of the forestry drains are levelled or smoothed out using a combination of damping down with the excavator bucket, flipping or mulching stumps, and cross tracking. The operation can employ all 3 techniques.

Smoothing with Bucket

When the peat is malleable and stumps are small and can be crushed into the ground, damping down with the bucket can be used. When the peat is not as malleable, the stump can be mulched or flipped as described below. The entire area can be smoothed off either by damping down with the bucket, or cross tracking.

Cross-Tracking

Once the surface of the ground has been smoothed as described above, the excavator then tracks over the bog surface and the weight of the machine will compress the surface (cross tracking). The aim is to retain as much of the bog vegetation as possible and not bring up too much deep peat to the surface which takes longer to revegetate. The use of a low ground pressure excavator with wide tracks (1.9m or greater) will reduce compaction of the site.

2.3.10.4.4 **Stump Flipping and mulching**

Using a low ground pressure excavator with a toothed bucket, the root plate of a stump can be carefully dug up, flipped and pushed into the adjacent furrow. The plough ridges are then smoothed out by sliding the ridge material carefully into the furrows with the excavator bucket, ensuring any vegetation remains on top.

Stump mulching: Involves the removal of the stump using a stump removal attachment fitted to an excavator. This process is similar to stump flipping, except that the stump is mulched instead of flipped before the ground is smoothed.

2.3.10.4.5 **Removal of Self-Seeded Trees**

To prevent the colonisation of the restoration area by tree species, the site is to be monitored for all seedling regeneration and the regeneration removed annually for the first five years. The frequency of maintenance and monitoring will be reviewed at that stage and can be reduced if there is little ongoing colonisation. The colonisation will not be allowed to compromise the conservation status of the restored habitat and the monitoring frequency will ensure that this does not happen. The period between monitoring visits and associated maintenance will not exceed 5 years.

2.3.10.5 Linear Habitats

It is proposed to plant c. 1,960m of hedgerow and riparian woodland habitat within the Site. These have been strategically chosen to link up existing areas of bat activity and to extend connectivity through the Site. It is also proposed to bolster and maintain c.3.4 km of gappy or poor-quality hedgerow habitats in the eastern section of the Site.

Riparian planting will be carried out along the Knockacarn River in the east of the Site; all saplings will be planted by hand to reduce to potential for bare soil exposure and sediment runoff. Strictly no fertilisers will be used in the riparian zone.

Species to be planted for both hedgerows and riparian planting include:

- Hawthorn (*Crataegus monogyna*)
 - Proportion of hedgerow mix: 75%
 - Age class to be planted: combination of whips and advanced nursery stock (10cm – 12 cm girth trees) to increase structure diversity.
- Hazel (*Corylus avellana*)
- Blackthorn (*Prunus spinosa*)
- Rowan (*Sorbus aucuparia*)
- Elder (*Sambucus nigra*)
- Goat Willow (*Salix caprea*)
- Grey willow (*Salix cinerea*)

The following measures will be followed when planting Riparian woodland:

- Mark out the area for planting so it is clear exactly where planting will be established.
- Use thin stakes or sticks to mark the rows or areas of trees to be planted.
- It is recommended that there are 2m spacings between trees. Shelterbelt planting may be applied by planting up two lines of trees as a staggered row.
- All planting will be done by hand and will be undertaken by a suitably qualified arborist.
- Planting will be undertaken in the dormant season, between November and March.
- Hedgerow will be pit planted, in areas of clear vegetation. This involves using a spade to dig a hole with roots placed in the centre. Soil is then placed around the hedgerow and firmed in, ensuring the tree is upright.

2.3.10.5.1 Hedgerow Management

- Hedgerows to be trimmed on a 2 or 3-year rotation to maximise structural diversity and to prevent over-trimming,
- Hedgerows to reach approx. 2.5m height with an ‘A’ shape,
- Cut hedgerows 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,
- Avoid the use of fertilisers, slurry, herbicides and pesticides.

2.3.11 Tree Felling and Replanting

2.3.11.1 Tree Felling

Tree felling will be required within and around the permanent built infrastructure footprint of the Proposed Project to allow for the construction of the Proposed Turbines, access roads, underground cabling, and other ancillary infrastructure, as well as within the Proposed Enhancement Site as part of

the Biodiversity Management and Enhancement Plan (BMEP) for the Proposed Project (see Section 2.3.10.1.1 above and Appendix 6-4 of the EIAR).

Approximately 144ha (hectares) of forestry will be felled to accommodate the Proposed Project, 20.7ha of which will be around the permanent built infrastructure of the Proposed Project, inclusive of Proposed Turbines T01, T02, T04 and T09, associated infrastructure and an additional 123.3ha as part of the BMEP.

Please note, the conifer plantation to be felled as part of the permanent built infrastructure of the Proposed Project footprint 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.

2.3.11.2 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 roads, 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 20.7ha of conifer plantation 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 felling. 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. An additional 123.3ha will be permanently felled as part of the hen harrier enhancement plan included in the BMEP measures identified above and in Appendix 6-4, will be subject to the condition of any felling licence that will be issued in respect of the Proposed Project. 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 Approval² 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 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 Appropriate Assessment purposes).

The Applicant commits to replanting the required extent of conifer plantation, outside the hydrological catchments within which the Site is located as per the condition of the felling licence in respect of the Proposed Project. On this basis, it is reasonable to conclude that there will be no cumulative effects associated with the replanting of 20.7ha 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.

² 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.

2.3.12 Borrow Pit

The estimated volume to be extracted from the borrow pit for the construction of the Proposed Project is up to 100,000m³. This figure presented is the anticipated maximum volumes; however, the actual volumes to be removed from the borrow pit will be confirmed at the time of construction and following detailed pre-construction site investigation works.

The borrow pit will be constructed as follows:

- 1. Peat and overburden will be removed and temporarily stored in a localised area adjacent to the borrow pit location before being placed into the permanent peat/spoil management areas within the borrow pit. The rock within the proposed borrow pit footprint will be removed by either breaking or blasting depending on its excavatability, which will be determined from confirmatory ground investigation carried out at the proposed borrow pit. The ground investigation will comprise rotary core drilling with associated engineering logging including rock quality designation and strength and durability testing. Data from the available ground investigation surveys undertaken to date indicates that the rock can be removed by breaking, however blasting could also be used.*
- 2. 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 road. As excavation progresses into the back edge of the borrow pits, localised deepening of the borrow pit floors may be required depending on extraction operations.*
- 3. Slopes within the excavated rock formed around the perimeter of the borrow pit will be formed at stable inclinations to suit local in-situ rock conditions. Exposed sections of the rock slopes will be left with irregular faces and declivities to promote re-vegetation and provide a naturalistic appearance.*
- 4. The stability of the rock faces 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 rock conditions to be identified and suitable mitigation measures to be applied such as removal of loose rock, in line with best practice guidelines.*
- 5. Rock from the borrow pit will be excavated whilst leaving in place upstand/segment of intact rock which will help to retain the placed peat and spoil. The upstands/segments of intact rock will essentially act as an engineered rock berm inside the borrow pit (below ground level).*
- 6. Excavation and infilling of the borrow pit will need to be sequenced and programmed. This will involve leaving in place upstands/segments of intact rock which will retain the placed peat and spoil and will allow the borrow pit to be developed and infilled in cells. These cells will be opened in sequence and filled as needed.*
- 7. 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. 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.*
- 8. The use of temporary access ramps and long reach excavators during the placement of the excavated peat and spoil will be required.*
- 9. The surface of the placed peat and spoil will be shaped to allow efficient run-off of surface water from the placed arisings towards the perimeter of the borrow pit. The surface of the placed spoil will have a maximum grade of 5o.*
- 10. As the internal buttress is slightly higher than the retained peat, 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 cells. These drains will be 150mm diameter flexible plastic drainage pipe or equivalent.*

11. *A layer of geogrid to strengthen the surface of the placed peat within the borrow pit will be required.*
12. *An interceptor drain will also be installed around the perimeter 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.*
13. *Temporary control of groundwater within the borrow pit will be required and measures will be determined as part of the ground investigation programme. A temporary pump and suitable outfall locations will be required during construction.*
14. *A settlement pond will be constructed at the lower side/outfall location of the borrow pit and is shown on the drainage drawings.*
15. *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.*
16. *Supervision by the Project Geotechnical Engineer is required for the development of the borrow pit.*
17. *All the above-mentioned requirements will be implemented by the Contractor during construction.*

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

2.3.12.1 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.

2.3.12.2 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 as one blast is 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)³ and the British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*⁴.

2.3.13 Internal Underground Electrical (33kV) and Communications 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 road 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. 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. On completion, the ground will be reinstated. The route of the internal electrical and communication cabling will follow the access tracks as illustrated on the Site layout drawings included as Appendix 4-1 of the EIAR. The cabling may be placed on either side of the road footprint, on both sides of the road and/or within the road. The exact configuration of the internal cabling will be set by the requirements of the electrical designers at detailed design stage.

Proposed Grid Connection Site 33kV Underground Cabling

The Proposed Grid Connection Site 33kV underground cabling will be laid beneath the surface of the Site and/or public road using the following methodology:

- Before works commence, surveying will take place along the proposed cable route, with all existing culverts identified. All relevant bodies i.e. ESB, Clare County Council etc. will be contacted and all drawings for all existing services sought.
- When the cable is located on public roads, a traffic management plan will be set up prior to any works commencing. A road opening licence will be obtained where required and all plant operators and general operatives will be inducted and informed as to the location of any services.
- The cable ducts will be concrete surrounded where they pass under the public road and under drains or culverts.
- A tracked 360-degree excavator will then proceed to dig out the proposed trench, typically to a depth of 1200mm, within which the ducts will be laid.
- Trench supports will be installed, or the trench sides will be benched or battered back where appropriate and any ingress of ground water will be removed from the trench using submersible pumps, fitted with appropriate silt filtration systems, to prevent contamination of any watercourse.

³https://www.hsa.ie/eng/Publications_and_Forms/Publications/Mines_and_Quarries/Guidance%20on%20the%20Safe%20Use%20of%20Explosives%20in%20Quarries.pdf

⁴<https://www.thenbs.com/PublicationIndex/documents/details?Pub=BSI&DocID=305965>

- Once the trench has been excavated, a base-layer will be laid and compacted, comprising Clause 804, or 15 Newton CBM4 concrete as required.
- The ducting will be installed as per specification, with couplers fitted and capped to prevent any dirt etc. entering the duct. In poor ground conditions, the ends of the ducts will be shimmed up off of the bed of the trench, to prevent any possible ingress of water dirt. The shims will be removed again once the next length has been connected. Extreme care will be taken to ensure that all duct collars (both ends) are clean and in good condition prior to ducts being joined.
- As the works progress, the as-built location of the ducting will be recorded using a total station or GPS.
- As per the associated base-layer (Clause 804 material or 15 Newton CBM4 concrete) will be installed and compacted as per approved detail, with care not to displace the ducting.
- Spacers will be used to ensure that the correct cover is achieved at both sides of the ducting.
- The remainder of the trench will be backfilled in two compacted layers with approved engineer's specified material.
- Yellow marker warning tape will be installed across the width of the trench, at 300mm depth,
- The finished surface is to be reinstated, as per original specification. Off-road cabling may be finished with granular fill to facilitate access to the trench for any potential maintenance that is required during the operational phase of the Proposed Project.
- Marker posts will then be placed at regular intervals (generally at joint bays and any change in direction) to denote the location of the underground power cables.

2.3.13.2 Existing Underground Services

Any underground services encountered along the Proposed Grid Connection Site will be surveyed for level and the ducting will pass over the service provided adequate cover is available. A minimum clearance of 300 mm will be required between the bottom of the ducts and the service in question. If the clearance cannot be achieved the ducting will pass under the service and again 300 mm clearance between the top of the communications duct and bottom of the service will be achieved. In deeper excavations an additional layer of marker tape will be installed between the communications duct and top level yellow marker tape. If the required separation distances cannot be achieved then a number of alternative options are available such as using steel plates laid across the width of the trench and using 35N concrete surrounding the proposed ducting where adjacent services are within 600mm, with marker tape on the side of the trench. Back fill around any utility services will be with dead sand/pea shingle where appropriate.

2.3.13.3 Joint Bays/Pits

Joint bays are typically pre-cast concrete chambers where lengths of cable will be joined to form one continuous cable. Joint bays will be located at various points along the Proposed Grid Connection Site generally between 600 to 800 metre intervals or as otherwise required by the electrical designer requirements. Joint Bays are typically 2.03m x 4.5m x 1.475m pre-cast concrete structures installed below finished ground level.

Where possible, joint bays will be located in areas where there is a natural widening/wide grass margin on the road in order to accommodate easier construction, cable installation and create less traffic congestion. Joint Bays will be located in the non-wheel bearing strip of roadways, however given the narrow profile of local roads this may not always be possible. During construction the joint bay locations will be completely fenced off once they have been constructed, they will be backfilled until cables are being installed. Once the cabling is installed the joint bays will be permanently backfilled with the existing surface re-instated and there will be no discernible evidence of the joint bay on the ground. Mitigation measures will be implemented throughout the construction process to ensure the

installation and construction of the joint bays does not impact nearby protected structures and/or watercourses.

Joint pits are localised trench widenings where the cables can be pulled and connected without the use of pre-cast concrete chambers. Joint pits will be located primarily out of the public road corridor unless requested by the Local Authority. During construction the open pits will be fenced off and will be temporarily backfilled until cable installation. The pits may be supported with sandbags during cable jointing. Following the installation of cabling, the pits will be permanently backfilled with the existing surface re-instated and there will be discernible evidence of the joint pit on the ground. Mitigation measures will be implemented throughout the construction process to ensure the installation and construction of the joint pits does not impact nearby protected structures and/or watercourses.

The precise siting of all Joint Bays within the planning corridor assessed is subject to approval by ESBN and EirGrid.

The installation of cabling normally involves pulling three individual conductors into three separate ducts. The cable pulling winch must be set at a predetermined cut off pulling tension as specified by the designer. The cable will be connected to the winch rope using approved suitably sized and rated cable pulling stocking and swivel or the pulling head fitted by the cable manufacturer. Once the “two sections” of cable are pulled into the joint bay, a jointing container will be positioned over the joint bay and the cable jointing procedure carried out in this controlled environment.

Following the completion of jointing and duct sealing works in the joint bay, place and thoroughly compact cement-bound sand in approximately 200 mm layers to 100mm above the top of the cable joint base to provide vertical support. A cable protection strip will be installed at this depth and the joint bay backfilled with cement-bound sand and reinstated to match surrounding areas.

2.3.13.4 **Underground Cable Watercourse/Culvert/Service Crossings**

A total of 15 no. watercourse and culvert crossings along the Proposed Grid Connection Site 33kV underground cabling, of which 4 no. EPA mapped watercourses. The remaining crossings are classified as culverts. The locations of the watercourse crossings are shown on the detailed layout drawings in Appendix 4-1 and Chapter 4 Figure 4-35 of the EIAR. Details of each crossing method are presented in Table 4-5 of Chapter 4 of the EIAR. The watercourse crossing methodologies for the provision of the proposed 33kV underground cabling component of the Proposed Project at these locations is set out below with the most appropriated option being selected for each crossing. Instream works are not required at any watercourse crossing within the Proposed Grid Connection Site.

Should an alternative methodology option be required for individual crossings during the construction process this will be agreed with the relevant authorities including Clare County Council prior to works commencing.

Standard Trefoil Formation Over – Type A

Watercourses will not be directly impacted upon since no instream works or bridge/culvert alterations are proposed. Where adequate cover exists above a bridge/culvert or where a new bottomless box culvert or clear-span structure has been installed at a sufficient depth, the standard ESB approved trefoil arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert, water course or existing underground service. The cable trench will pass over the crossing in a standard trench.

Please see Appendix 4-1 and Chapter 4 of the EIAR for further details.

Flatbed Formation Under – Type B

Where cable ducts are to be installed under an existing watercourse or service crossing where sufficient cover cannot be achieved by installing the ducts in a trefoil arrangement, the ducts will be laid in a much shallower formation, at a depth of which will be determined by the location of the bottom of the obstacle or the depth of excavatable material under it. The ducts will be laid in this trench in a flatbed formation under the existing watercourse/ service and will be encased in 6mm thick steel galvanized plate with a 35N concrete surround as per ESB Networks specification.

Please see Appendix 4-1 and Chapter 4 of the EIAR for further details.

Shallow Formation Crossing over Culvert – Type C

Where cable ducts are to be installed over a watercourse or service crossing where sufficient cover cannot be achieved by installing the ducts in a trefoil arrangement, the ducts will be laid in a much shallower trench the depth of which will be determined by the location of the top of the obstacle or the depth of excavatable material over it. The ducts will be laid in this trench in a flatbed formation over the existing culvert/service and will be encased in 6mm thick steel galvanized plate with a 35N concrete surround as per ESB Networks specification.

Where a bridge/culvert or service has insufficient cover depth to fully accommodate the required trench, the ducts can be laid in a flatbed formation partially within the existing road surface. Where this option is to be employed, the ducts will also be encased in steel with a concrete surround as per ESB Networks specifications. In order to achieve cover over these ducts and restore the carriageway of the road, it may be necessary to raise the pavement level locally to fully cover the ducts. The increased road level will be achieved by overlaying the existing pavement with a new wearing course as required. Any addition of a new pavement will be tied back into the existing road pavement at grade. After the crossing over the culvert has been achieved, the ducts will resume to the trefoil arrangement within a standard trench.

Please see Appendix 4-1 and Chapter 4 of the EIAR for further details.

Horizontal Directional Drilling – Option D

The horizontal directional drilling method of duct installation is carried out using Vermeer D36 x 50 Directional Drill (approximately 22 tonnes), or similar plant. The launch and reception pits will be approximately 2.5m wide, 2.5m long and 2.0m deep. The pits will be excavated with a suitably sized excavator. The drilling rig will be securely anchored to the ground by means of anchor pins which will be attached to the front of the machine. The drill head will then be secured to the first drill rod and the operator will commence to drill into the launch pit to a suitable angle which will enable him to obtain the depths and pitch required to the line and level of the required profile. Drilling of the pilot bore will continue with the addition of 3.0m long drill rods, mechanically loaded and connected into position.

During the drilling process, a mixture of a natural, inert and fully biodegradable drilling fluid such as Clear Bore™ and water is pumped through the centre of the drill rods to the reamer head and is forced in to void and enables the annulus which has been created to support the surrounding subsoil and thus prevent collapse of the reamed length. Depending on the prevalent ground conditions, it may be necessary to repeat the drilling process by incrementally increasing the size of the reamers. When the reamer enters the launch pit, it is removed from the drill rods which are then passed back up the bore to the reception pit and the next size reamer is attached to the drill rods and the process is repeated until the required bore with the allowable tolerance is achieved.

The use of a natural, inert and biodegradable drilling fluid such as Clear Bore™ is intended to negate any adverse impacts arising from the use of other, traditional polymer-based drilling fluids and will be used sparingly as part of the drilling operations. It will be appropriately stored prior to use and

deployed in the required amounts to avoid surplus. Should any excess drilling fluid accumulate in the reception or drilling pits, it will be contained and removed from the site in the same manner as other subsoil materials associated with the drilling process to a licensed recovery facility.

Backfilling of launch & reception pits will be conducted in accordance with the normal specification for backfilling excavated trenches. Sufficient controls and monitoring, as listed below, will be put in place during drilling to prevent frack-out, such as the installation of casing at entry points where reduced cover and bearing pressure exists.

- The area around the Clear Bore™ batching, pumping and recycling plants shall be bunded using terram and sandbags in order to contain any spillages;
- One or more lines of silt fences shall be placed between the works area and adjacent rivers and streams on both banks;
- Accidental spillage of fluids shall be cleaned up immediately and transported off site for disposal at a licensed facility; and,
- Adequately sized skips will be used for temporary storage of drilling arisings during directional drilling works. This will ensure containment of drilling arisings and drilling flush.

Please see Appendix 4-1 and Chapter 4 of the EIAR for further details.

2.3.14 **Extension to Existing Slievecallan 110kV Substation**

The proposed substation extension will be constructed by the following methodology:

- The dimensions of the substation extension area have been designed to meet the current requirements of the ESB or EirGrid;
- One control building will be built within the substation compound;
- The foundations will be excavated down to the level indicated by the designer and appropriately shuttered reinforced concrete will be laid over it. An anti-bleeding admixture will be included in the concrete mix;
- The block work walls will be built up from the footings to damp proof course level and the floor slab constructed, having first located any ducts or trenches required by the follow on mechanical and electrical contractors;
- The block work will then be raised to wall plate level and the gables & internal partition walls formed. Scaffold will be erected around the outside of the building for this operation;
- The concrete roof slabs will be lifted into position using an adequately sized mobile crane;
- The timber roof trusses will then be lifted into position using a telescopic load all or mobile crane depending on site conditions. The roof trusses will then be felted, battened, tiled and sealed against the weather.
- The substation plinths will be shuttered and poured with reinforced concrete. An anti-bleeding admixture will be included in the concrete mix.
- The electrical equipment will be installed on a concrete plinth and commissioned.
- Perimeter fencing will be erected.
- The construction and components of the substation extension have been designed to ESB/EirGrid specifications.

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 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 4.7 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. No routes of any natural drainage features will be altered as part of the Proposed Project. The Proposed Project has where possible, been kept a minimum of 50 metres from 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.

Where artificial drains are currently in place in the vicinity of proposed works areas, these drains may have to be diverted around the proposed works areas to minimise the amount of water in the vicinity of works areas. Where it may not be possible to divert artificial drains around proposed work areas, the drains will be blocked to ensure sediment laden water from the works areas has no direct route to watercourses. Where drains have to be blocked, the blocking will only take place after an alternative drainage system to handle the same water has been put in place.

Existing artificial drains in the vicinity of existing site roads will be maintained in their present location where possible. If it is expected that these artificial drains will receive drainage water from works areas post treatment, check dams will be added (as specified below) to control flows and sediment loads in these existing artificial drains. If road widening or improvement works are necessary along the existing roads, where possible, the works will take place on the opposite side of the road to the drain.

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).

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 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.

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.

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.

Where artificial drains are currently in place in the vicinity of proposed works areas, these drains may have to be diverted around the proposed works areas to minimise the amount of water in the vicinity of works areas. Where it may not be possible to divert artificial drains around proposed work areas, the drains will be blocked to ensure sediment laden water from the works areas has no direct route to other watercourses. Where drains have to be blocked, the blocking will only take place after an alternative drainage system to handle the same water has been put in place.

Existing artificial drains in the vicinity of existing Proposed Wind Farm roads will be maintained in their present location where possible. If it is expected that these artificial drains will receive drainage water from works areas post treatment, check dams will be added (as specified below) to control flows and sediment loads in these existing artificial drains. If road widening or improvement works are necessary along the existing roads, where possible, the works will take place on the opposite side of the road to the drain.

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 buffer zones for 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 direct discharges to the existing hydrological features (forestry and agricultural drains or natural watercourses).

The Proposed Drainage Design is included as Appendix 4-3 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 4.7 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 Wind Farm Site 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 Proposed Wind Farm 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 Proposed Wind Farm 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 Proposed Wind Farm 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 Proposed Wind Farm 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.

The majority of the built infrastructure of the Proposed Project is >50m from any nearby watercourse, sections within 50m of the built infrastructure of the Proposed Project are confined to existing watercourse crossings at bridges and culverts. It is proposed to limit any works in any areas located within 50m of any watercourse/waterbody including the stockpiling of excavated soils and subsoils.

There is a total of 15 no. watercourse crossings (4 no. crossings over EPA mapped watercourses and 11 no. additional crossings over watercourses which are not included in the EPA database) along the Proposed Grid Connection Site 33kV underground cabling. All the crossings are existing bridges and culverts along farm access tracks, public road and wind farm access roads.

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 4.7 and Appendix 4-7 Surface Water Management Plan 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 and Section 2.3.4 above and in Chapter 4 Section 4.7 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

All materials and equipment necessary to implement the drainage measures outlined above, will be brought on-site in advance of any works commencing. An adequate amount of straw bales, clean stone, terram, stakes, etc will be kept on site at all times to implement the drainage design measures as necessary. The drainage measures outlined in the above will be installed prior to 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 in particular, working under a schedule of works operation system (SOWOR) system as proposed in the planning application. 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 Site that are further removed from the Proposed Wind Farm Site it may be more practical to transport excess excavated material to a nearby licenced facility.

On steeper slopes, silt fences, as detailed in Chapter 4 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 weather forecasting website. The reference location will be that of Slieveacurry, Co. Clare.

<https://www.yr.no/en/forecast/daily-table/2-3309122/Ireland/Munster/County%20Clare/Slieveacurry>

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 Proposed Wind Farm 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 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 3-1 Typical concrete wash out areas

3.2.7 Tree Felling Drainage Measures

As discussed in Section 2.3.11 above, tree felling will be required within and around the built infrastructure footprint to allow for the construction of the proposed turbines, access roads, 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 of the EIAR.

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 Hydrology and Hydrogeology 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 Toolbox 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;
- Brush 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. Brush mat renewal should take place when they become heavily used and worn. Provision should be made for brush 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 cultural heritage mitigation measures outlined in Chapter 14 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 Site.

Three recorded monuments are located within the Site and comprise a multiple stone circle (CL031-052—), an earthwork (CL031-019—) and a ringfort (CL031-018—). The ringfort and earthwork are located at the west side of the Site and are not located in proximity to any Proposed Wind Farm Site infrastructure. The earthwork CL031-019— is located c. 800m to the west of the nearest proposed turbine, T7, while the ringfort CL031-018— is located c. 1.5km south-west of T7. The monuments are located adjacent to but outside areas proposed for conifer felling as part of the BMEP.

Stone circle CL031-052— is located in low-lying boggy pasture c. 48m to the east of an existing farm track. A second farm track (proposed for upgrade) is located to the west of the aforementioned track, c. 79m west of the monument. A borrow pit is proposed to be located immediately to the west of the existing track due for upgrade, c. 86m to the west-south-west of the stone circle. The proposed location of T5 is located c. 275m to the north of the monument with the proposed location of T6 c. 570m to the south-west. The Proposed Grid Connection Site 33kV underground cabling is located c. 290m to the south of the monument.

A derelict stone house (CH1) was recorded in forestry adjacent to the Proposed Grid Connection Site 33kV underground cabling during the field survey (ITM E512924, N679668) in the townland of Letterkelly. The structure is located within forestry although a small area around the structure remains

unplanted. It is poorly preserved, roofless and overgrown both within and surrounding the structure. A number of buildings are marked on the first, second and third edition OS map in this location and one of the buildings is likely to represent the surviving structure. The structure is located c. 10m to the east-north-east of the proposed 33kV underground cabling. The building is likely to date the mid-late 19th Century. It is not subject to statutory protection, however, it does represent an item of local cultural heritage merit.

Given that the archaeological monument will be located less than 100m from proposed ground works and moving machinery; the following mitigation measures will be implemented:

- *A 30m exclusion zone will be established around Stone Circle CL031-052— prior to the commencement of the construction phase of the Proposed Project. The exclusion zone will be established under the supervision of the appointed archaeologist and be delimited by durable fence posts and fencing with ‘Keep Out’ signage. A photographic record of the exclusion zone will be made by the appointed archaeologist and included in the subsequent reporting for the Site.*
- *The location of recorded monuments CL031-018— Ringfort and CL031-019— Earthwork should be clearly shown in the CEMP. No tracking of machinery or other activities associated with the conifer felling will take place in the area of the recorded monuments.*
- *A 10m exclusion zone will be established around CHI stone structure prior to the commencement of the construction phase of the project. The exclusion zone will be established under the supervision of the appointed archaeologist and be delimited by durable fence posts and fencing with ‘Keep Out’ signage. A photographic record of the exclusion zone will be made by the appointed archaeologist and included in the subsequent reporting for the Site.*

Recorded monuments CL031-018— Ringfort and CL031-019— Earthwork are shown in Figure 3-1 of this CEMP below.

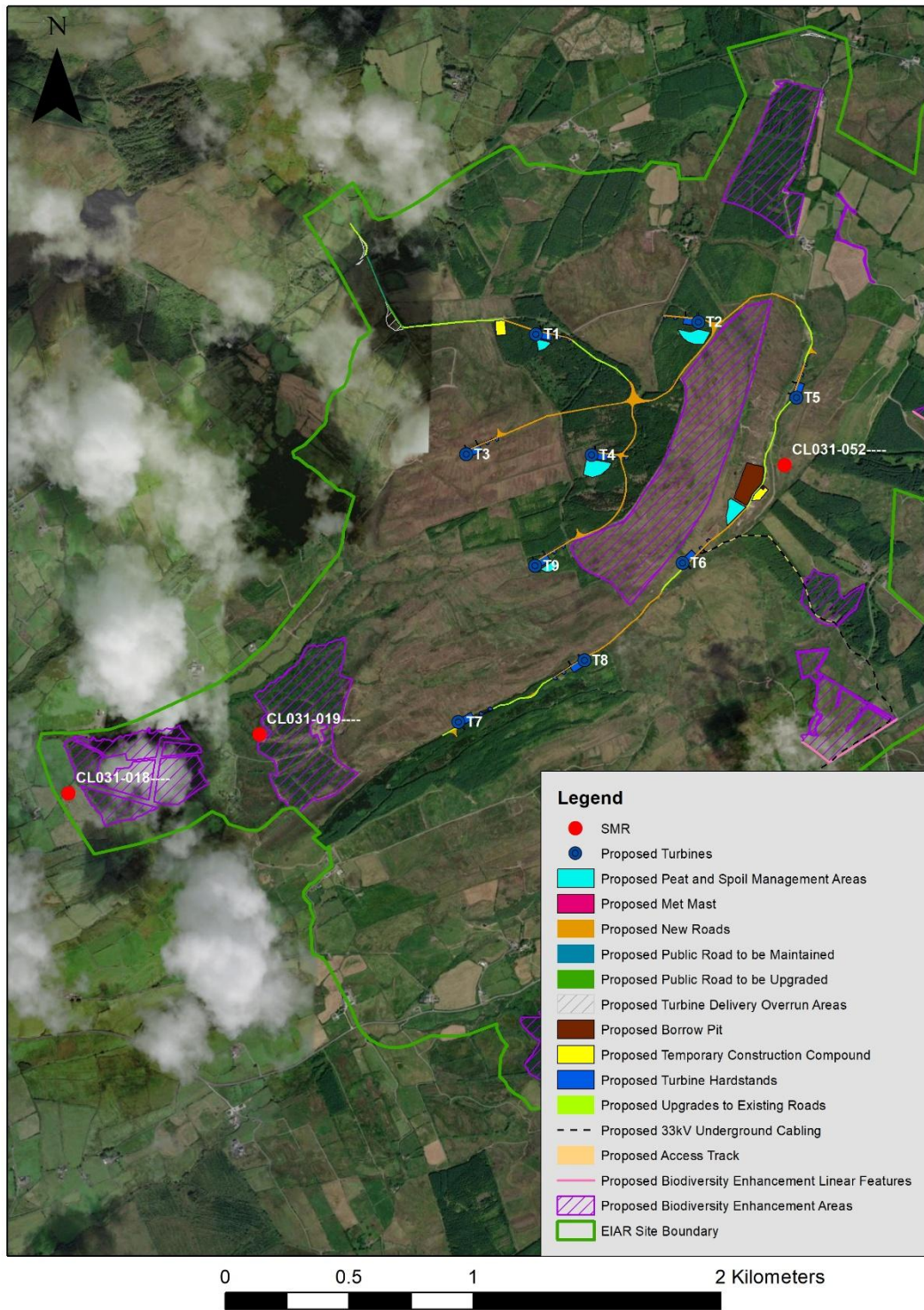
Archaeological monitoring will be ongoing during the construction phase of the Proposed Project which is outlined below:

- *Archaeological monitoring under licence from the NMS of any geotechnical / engineering trial pits or investigations will be carried out by a suitably qualified archaeologist. A report detailing the results of the monitoring will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body.*
- *Pre-development testing, under licence from the NMS, will be carried out in areas where peat depths allow a meaningful investigation. Testing will only be undertaken in areas where ground disturbance will take place as part of the Proposed Project. Where peat depths become a limitation to testing, monitoring at the construction stage will be undertaken. The areas to be tested will be chosen by the appointed archaeologist and the number of test trenches agreed between the archaeologist and the NMS through the licensing system. A report on the testing will be compiled on completion of the work. Should archaeological finds, structures or deposits be uncovered as a result of the testing 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.*
- *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 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.

- *A walk-over survey of the Proposed Enhancement Areas will be carried out post-clear-felling but prior to any other works such as stump flipping or drain blocking.*
- *The location of any potential Cultural Heritage features therein will be recorded and a photographic record made of same. A report on the results of the walk-over survey will be compiled on completion of same and will include any further required mitigation measures such as buffer zones, etc, deemed necessary.*
- *A second phase of walk-over survey will be carried out after stump flipping to ensure that any potential finds, features or deposits, if present, can be recorded and any other mitigation required can be implemented where necessary.*

Figure 3-1 Recorded Monuments within the Site



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

The Port of Foynes has been selected and assessed to facilitate turbine delivery to the Proposed Wind Farm Site. It is proposed that large wind turbine components will be delivered to the Proposed Wind Farm Site from the Port of Foynes, via the N85 National Secondary Road. From Ennis the turbines will be transported northwest along the N85 National Secondary Road to Inagh before turning left on to the R460 Regional Road and transported west for 4.2km to the junction with the L1074 Local Road. The turbines will be transported west/northwest for 4.1km before turning left onto the L1076 local road at Fahabeg. At Fahabeg, the turbines will be transported southwest for 2km after which the route will take a sharp left onto the L6230 local road approaching the Site from the northwest.

General construction deliveries and staff will access the Proposed Wind Farm Site via an existing access track off the L6230 local road to the northwest of the Site. This entrance will be widened to facilitate the delivery of the construction materials and turbine components (further detailed in Chapter 4, Section 4.6).

It is proposed that construction staff will travel to and from the point of construction along the Proposed Grid Connection Site by minibus, or alternatively, staff will travel to the site by carpooling encouraged as part of a staff travel plan. By its nature the impacts of these additional trips on the network will be transient and will therefore be temporary and slight, and not significant.

The construction methodology of providing underground cabling within and along local road networks is well established and accepted nationwide. There are in excess of 300 wind farms currently operational in Ireland and the majority of these are connected to the national grid via underground cable connections, predominantly along the public road networks.

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 Clare 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 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.
- **Diversion routes during underground cabling construction** – The identification and agreement with suitable diversion routes during the construction of the proposed 33kV underground cabling.
- **Liaison with the relevant local authority** - Liaison with Clare 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 Clare 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.
- **One-way delivery systems** (concrete pour days) - HGVs leaving the site on the busiest construction days (i.e. the 9 days when the concrete foundations are poured) to return to their plant via a short detour

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 Proposed Wind Farm 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 Site 33kV underground cabling 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 Proposed Wind Farm Site proposed new entrance will be checked weekly for damage/potholes and repaired as 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 Proposed Wind Farm 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.
- Groundworks (i.e. works with potential to create dust) associated with the Proposed Project will be fully supervised by an Ecological Clerk of Works (ECoW).
- The ECoW will regularly monitor adjacent marsh fringing habitat on a daily basis for potential signs of dust deposition or any other habitat degradation. Dust level thresholds and weather will also be monitored.
- 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 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.
- The roads adjacent to the Proposed Wind Farm Site proposed new entrance will be checked weekly for damage/potholes and repaired as necessary.

- The transportation of construction materials from the onsite borrow pit for the 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 Proposed Wind Farm Site to detect any exceedances of acceptable dust levels.

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 roads 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 list of measures will be considered, where necessary, to ensure compliance with the relevant construction noise criteria:

- 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;
- Monitoring typical levels of noise and vibration during critical periods and at sensitive locations;
- Selection of plant with low inherent potential for generation of noise and/ or vibration where practical;
- Placing of noise generating / vibratory plant as far away from sensitive properties as practical within the site constraints, and;
- 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.

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.

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.

3.7 Invasive Species Management

During field surveys, a search for Invasive Alien Species (IAS) listed under the ‘Third Schedule’ of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) and the ‘First Schedule’ of the European Union (Invasive Alien Species) Regulations 2024 (S.I. 374 of 2024) was conducted. One species - Rhododendron (*Rhododendron ponticum*) - was recorded at multiple locations within the Site.

Full details of all scheduled invasive species recorded during the surveys, with locations, are provided in the Invasive Species Management Plan (ISMP) in Appendix 6-5 of the EIAR.

3.7.1 Site Set Up

Prior to the commencement of any works, the following site setup procedures will be carried out:

- A pre-commencement survey for Rhododendron will be undertaken by a fully qualified ecologist to determine the locations and extent of the species within the Site and to determine whether there have been any changes in the extent of the infestation since the undertaking of previous surveys.
- The locations and extent of Rhododendron within the Site will be clearly marked out using hazard tape to ensure they are not disturbed. A 10m buffer zone surrounding each stand will also be applied using temporary fencing, to avoid disturbance of potentially contaminated soils.

Given the largely interspersed recordings of this species within the Site, it is proposed to treat the plant in-situ. The Ecoplug method to treatment is outlined below:

- Cut the tree/plant as close to the ground as possible. This should be carried out from October to early March, outside the bird nesting season.
- The cut material can be stacked and stored on site, used as firewood or mulched.
- A 30 mm hole will be drilled into the remaining stump and the Ecoplug will be inserted into the hole until it is flush with the top of the stump.

- Where immature plants occur, hand pulling can be undertaken at any time of the year and left to dry out on an impermeable surface.

Where the Ecoplug method is unsatisfactory, such as with smaller saplings, manual extraction of the root/stump from the ground is recommended. The following methods for root extraction are outlined below:

- Cut the tree/plant as close to the ground as possible. This should be carried out from October to early March, outside the bird nesting season.
- The root/stump will be removed from the ground using hand tool or an excavator.
- The cut material can be stacked and stored on the Site, used as firewood or mulched.
- The root/stump will be placed on an impermeable surface such as palettes or a radon barrier membrane and left to dry out.

For infestations within or adjacent to the built infrastructure footprint of the Proposed Project, following treatment or eradication of the plant, the soil at the site of the infestation should still be considered contaminated on a precautionary basis. In order to avoid the potential spread of the species, the top layer of soil/peat from the 10m buffer zone will be removed and stored outside of the construction footprint, and within the Site and will then be clearly fenced off. This area will then be monitored and if necessary, re-treated following the initial treatment and should continue until no growth is recorded for a period of at least two consecutive years. Alternatively, the excavated spoil from within the buffer zone can be moved to an offsite waste facility, under licence from NPWS.

3.7.2 Post Treatment Monitoring

Ongoing monitoring will be required, with suitable follow-up management in order to control new growth or re-establishment of this species within the infested areas.

Following the initial treatment and completion of the development, the treated areas will be re-surveyed annually and if necessary, re-treated until no growth is recorded for two consecutive years. If invasive plants are found to be re-establishing, they shall be treated as per the measures outlined in the ISMP.

3.7.3 Site Hygiene and Biosecurity Measures

The following site hygiene and biosecurity measures will be adhered to for the management of invasive species within the entire Site:

- No ground works will take place on site prior to the application of this site-specific ISMP. The ISMP will ensure all measures are taken to avoid the spread of species discussed in this report.
- All works in relation to the invasive species will be supervised by an ECoW.
- All staff will be given a Toolbox Talk, by a suitably qualified person or ecologist, on invasive species removal in relation to Rhododendron and their management on site.
- The contractor will assign a member of their team as Environmental Officer to ensure the management plan is adhered to throughout the proposed works.
- A designated bio-secure area/exclusion zone will be set up at recorded invasive species locations to prevent disturbance in these areas. Invasive species will be marked with hazard tape in order to identify the species prior to vegetation clearance works and to keep it separate from other brush material.
- All machinery should be thoroughly cleaned down prior to arriving on the site to avoid the potential spread of invasive species from elsewhere.
- Machinery that is used for excavation and onsite removal of invasive material will not be used for any other works until they are fully cleaned down and then visually inspected by a specialist to ensure no fragments of invasive plant material are present.

- Prior to leaving the invasive species exclusion zones, all boots and clothing will be thoroughly brushed down to remove any contaminated material prior to leaving the area.
- As a precautionary measure, machinery will be thoroughly cleaned down before exiting the site to prevent potential spread of invasive species elsewhere.
- Clean down will be carried out using brushes and shovels and power washing will be avoided insofar as possible. This is to prevent potentially contaminated run-off spreading outside the Site.
- Material used for tracking machinery out of the contaminated areas on site e.g. plywood will be thoroughly cleaned down under supervision of the ECoW prior to removal off site.
- Any soil and topsoil required on the Site will be sourced from a stock that has been screened for the presence of any invasive species and where it is confirmed that none are present.
- Any material imported to the site should be screened for invasive species by a suitably qualified ecologist before transportation to the Site.

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.

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 Proposed Wind Farm Site where on site erection will occur.

The turbine and meteorological mast foundations will consist of stone from the onsite borrow pits 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 roads and existing roads for upgrade will be constructed with rock sourced from the onsite borrow pit. The construction of the proposed 33kV underground 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	EWG 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 Site 33kV underground cabling	17 03 02
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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 Proposed Wind Farm 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 Project 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 Proposed Project 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 development are outlined in Table 3-3 below.

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

Material Type	Example	EWC 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

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 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.

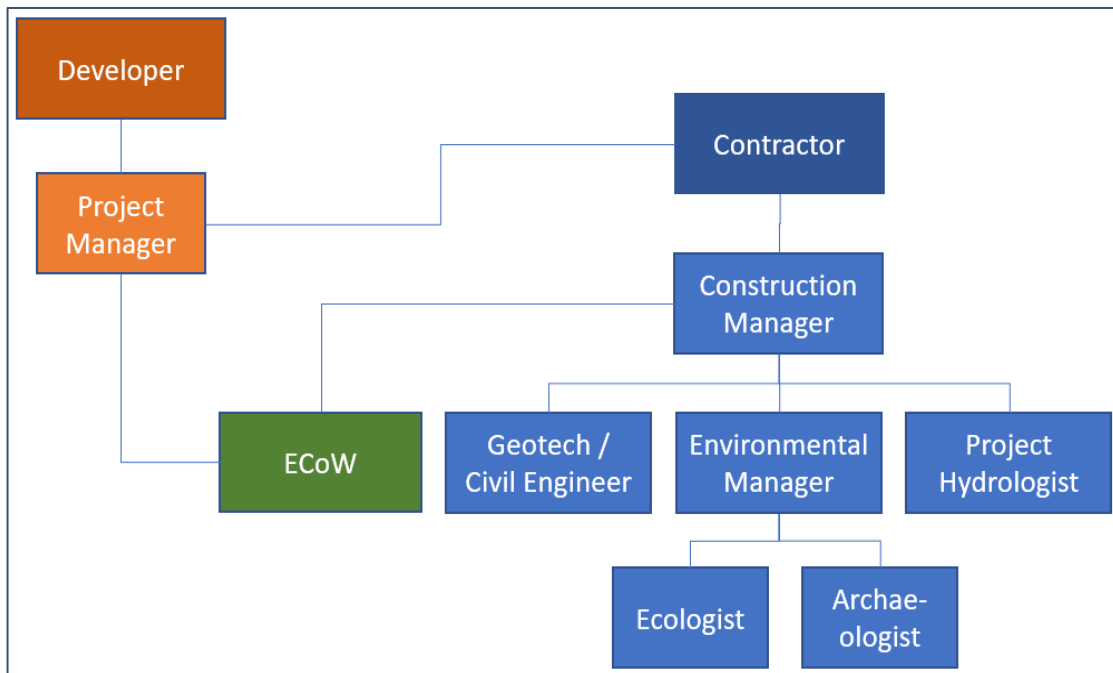


Figure 4-1 Proposed Project Organogram

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 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.

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.

During the construction phase field testing and laboratory analysis of a range of parameters with relevant regulatory limits and EQSs should be undertaken for each primary watercourse along the Proposed Grid Connection 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 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.

During the construction phase field testing and laboratory analysis of a range of parameters with relevant regulatory limits and EQSs should be undertaken for each primary watercourse along the Proposed Grid Connection Site 33kV underground cabling and specifically following heavy rainfall events (i.e. weekly, monthly and event based).

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 and each primary watercourse along the Proposed Grid Connection underground cabling route. 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.

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.

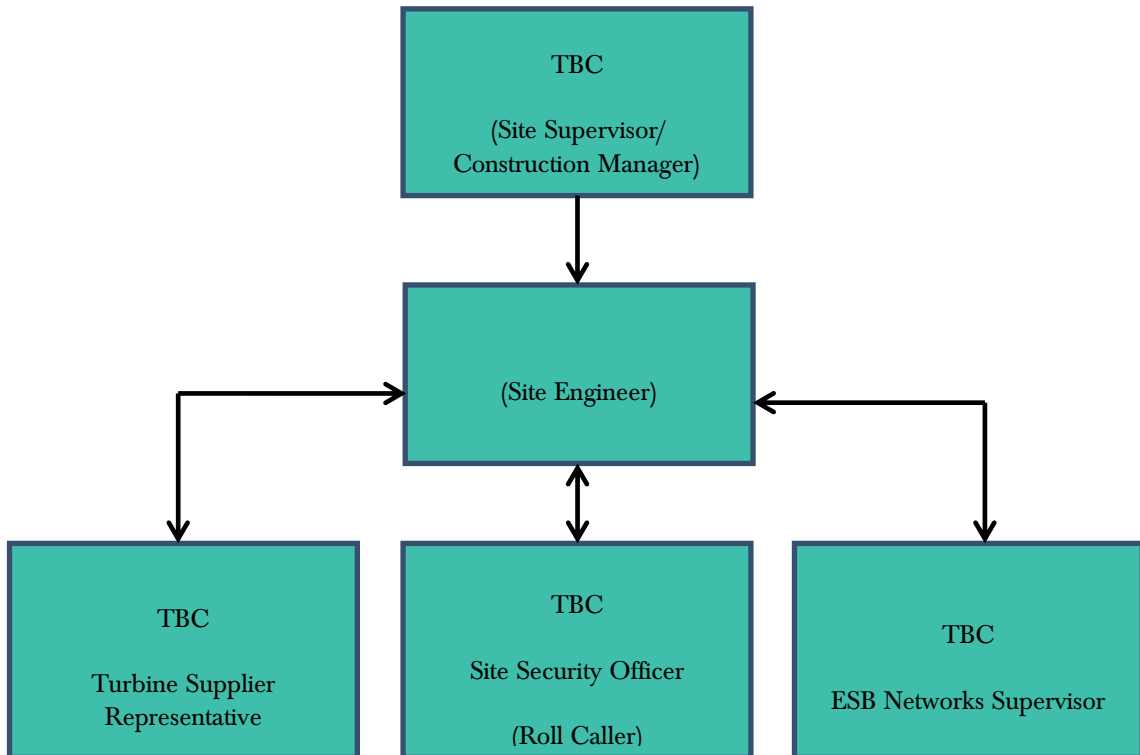


Figure 6-1 Emergency Response Procedure Chain of Command

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 Clare 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, cSAC or NHA), 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 Clare 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 – Miltown Malbay Centre	065 708 1442
Hospital – Ennistymon Community Hospital	065 707 1622
ESB Emergency Services	1800 372 999
Gas Networks Ireland Emergency	1800 20 50 50
Gardaí – Ennistymon Garda Station	065 707 2180
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: Slieveacurry Ltd.	021 7336034

6.4 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 involved 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.

6.5 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.	

7. **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 An Coimisiún Pleanála.

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 7-1 Schedule of Mitigation Measures

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
EIAR Chapter 4 – Description of the Proposed Project					
Pre-Construction Phase					
MM1	Environmental Management	EIAR Chapter 4	<p>All proposed construction activities and associated mitigation measures for 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.</p> <p>The CEMP includes details of drainage, peat and spoil management, waste management, and clearly outlines the mitigation measures and monitoring proposals that are required to be adhered to in order to comply with the environmental commitments outlined in the EIAR. In the event that 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.</p>		
MM2	Environmental Management	Appendix 4-5	<ul style="list-style-type: none"> ➤ 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 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM3	Surface Water Quality	Appendix 4-7	<ul style="list-style-type: none"> ➤ 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. 		
MM4	Site Drainage Plan	EIAR Chapter 4 Appendix 4-3 Appendix 4-5 Appendix 4-7	<ul style="list-style-type: none"> ➤ 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 4.7 of the EIAR. ➤ Prior to any works commencing on the upgrade of existing roads, the requirement for additional roadside drainage will be considered by the Project Hydrologist in line with the proposals outlined in Section 3 of the CEMP. <p>The key principles of drainage design that will be implemented and adhered to as part of the Proposed Project are as follows:</p> <ul style="list-style-type: none"> ➤ 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 buffer zones for the wind turbines. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ No alteration of natural watercourses. ➤ Maintain the existing hydrology of the Site. ➤ Blocking of existing manmade drainage as appropriate. <ul style="list-style-type: none"> ➤ 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. 		
MM5	Preparative Site Drainage Management	Chapter 4 Appendix 4-5 Appendix 4-7	<ul style="list-style-type: none"> ➤ Drains will be excavated, and silting ponds constructed to eliminate any suspended solids within surface water running off the Site. ➤ 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. 		
MM6	Drainage Inspection	Appendix 4-5 Appendix 4-7	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.		
MM7	Collector Drains	EIAR Chapter 4 Appendix 4-5	<ul style="list-style-type: none"> ➤ Collector drains will be installed downgradient of the main works areas to collect surface flow runoff where it might have come into contact with exposed surfaces and collected 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		Appendix 4-7	Collector drains 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.		
MM8	Interceptor Drains	<p>EIAR Chapter 4, 9</p> <p>Appendix 4-5</p> <p>Appendix 4-7</p>	<ul style="list-style-type: none"> ➤ 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 otherwise 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. 		
MM9	Watercourse Inspection	<p>EIAR Chapter 4</p> <p>Appendix 4-5</p>	Confirmatory inspections of the proposed watercourse crossing locations will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.		
MM10	Drainage Maintenance	<p>Chapter 4</p> <p>Appendix 4-5</p> <p>Appendix 4-7</p>	<ul style="list-style-type: none"> ➤ An inspection and maintenance plan for the on-site 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM11	Pre-construction Drainage	Appendix 4-5 Appendix 4-7	<p>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.</p> <p>Where artificial drains are currently in place in the vicinity of proposed works areas, these drains may have to be diverted around the proposed works areas to minimise the amount of water in the vicinity of works areas. Where it may not be possible to divert artificial drains around proposed work areas, the drains will be blocked to ensure sediment laden water from the works areas has no direct route to other watercourses. Where drains have to be blocked, the blocking will only take place after an alternative drainage system to handle the same water has been put in place.</p> <p>Existing artificial drains in the vicinity of existing Proposed Wind Farm roads will be maintained in their present location where possible. If it is expected that these artificial drains will receive drainage water from works areas post treatment, check dams will be added (as specified below) to control flows and sediment loads in these existing artificial drains. If road widening or improvement works are necessary along the existing roads, where possible, the works will take place on the opposite side of the road to the drain.</p>		
MM12	Tree Felling Drainage Measures	Appendix 4-5 Appendix 4-7	<p>Prior to the commencement of tree felling for subsequent road construction the following key temporary drainage measures will be installed:</p> <ul style="list-style-type: none"> ➤ 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, 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone. <p>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:</p> <ul style="list-style-type: none"> ➤ 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 Toolbox 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ 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. <p>To protect watercourses, the following measures will be adhered to during all keyhole/tree felling activities.</p> <ul style="list-style-type: none"> ➤ 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; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ 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; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ 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. 		
MM13	Peat and Spoil Management	EIAR Chapter 4, 8 Appendix 4-2 Appendix 4-3 Appendix 4-5	<ul style="list-style-type: none"> ➤ 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 reduce the likelihood of debris run-off. ➤ A silting pond will be required at the lower side of the management areas. ➤ All the recommendations/best practice guidelines for the placement of spoil in identified spoil management areas and alongside access roads will be confirmed by the Geotechnical Engineer prior to construction. 		
MM14	Underground Electrical (33kV) and Communications Cabling	EIAR Chapter 4 Appendix 4-5	<p>Before works commence, updated surveying will take place along the proposed cabling route, with all existing culverts and services identified. All relevant bodies i.e., ESBN, Clare County Council, GNI etc. will be contacted and all up to date information for all existing services sought.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM15	Waste Management	EIAR Chapter 4 Appendix 4-5	Prior to the commencement of the construction phase, a Construction Waste Manager will be appointed by the Contractor. The Construction Waste Manager will be responsible for the implementation of the objectives of the Waste Management Plan (WMP), 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.		
MM16	Traffic Management	EIAR Chapter 4, 15 Appendix 4-5 Appendix 15-2	<ul style="list-style-type: none"> ➤ 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. <p>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.</p>		
Construction Phase					
MM17	Refuelling	EIAR Chapter 4, 8, 9 Appendix 4-5 Appendix 4-6	<ul style="list-style-type: none"> ➤ 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		Appendix 4-7	<ul style="list-style-type: none"> ➤ 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 Proposed Wind Farm 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 contained within the CEMP. Spill kits will be available to deal with accidental spillages 		
MM18	Concrete-Based Products Deliveries and Management	EIAR Chapter 4, 9 Appendix 4-5	<ul style="list-style-type: none"> ➤ 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. 		
MM19	Concrete Pouring	EIAR Chapter 4, 9	<ul style="list-style-type: none"> ➤ 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 (including drains and ditches) while placing concrete. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		Appendix 4-5	<ul style="list-style-type: none"> ➤ Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets. ➤ Ensuring that covers are available, and used, when necessary, 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 truck's chute will be directed into a temporary, lined, impermeable containment area, or a Siltbuster-type concrete wash unit or equivalent. ➤ Surplus concrete after completion of a pour will be taken off-site and disposed of at an appropriately authorised facility. ➤ Concrete pours will be managed and supervised to ensure there will be no leakage/seepage/discharge of concrete or concrete water during the construction phase. ➤ Concrete wash water, and waste concrete will be managed appropriately on site at a lined concrete wash out pit(s). 		
MM20	Road Cleanliness	EIAR Chapter 4 Appendix 4-5	<ul style="list-style-type: none"> ➤ The Proposed Wind Farm 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 roads requires cleaning due to construction traffic associated with the Proposed Project. ➤ When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper. 		
MM21	Watercourse Buffers	EIAR Chapter 4, 9 Appendix 4-3	<ul style="list-style-type: none"> ➤ There will be no direct discharges to natural watercourses or drains. 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. ➤ Buffered outfalls, which will be numerous over the Proposed Wind Farm Site, will promote percolation of drainage waters across vegetation and close to the point at which the 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		Appendix 4-5	additional runoff is generated, rather than direct discharge to the existing drains of the Proposed Wind Farm Site.		
MM22	Water Discharge	EIAR Chapter 4 Appendix 4-5 Appendix 4-7	<ul style="list-style-type: none"> ➤ 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 Site drainage into the existing site drainage network where possible. 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. 		
MM23	Wastewater Management	EIAR Chapter 4	<ul style="list-style-type: none"> ➤ The temporary construction compounds will consist of temporary site offices, staff facilities and car-parking areas for staff and visitors. 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 permitted waste collector to wastewater treatment plants. There will also be a water supply onsite for hygiene purposes, by way of a temporary storage tank. The construction compound will also include a bunded refuelling and containment area for the storage of oil, lubricants and site generators etc, and full retention oil interceptor. 		
MM24	Interceptor Drains	EIAR Chapter 4, 9 Appendix 4-5	<ul style="list-style-type: none"> ➤ 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 otherwise 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		Appendix 4-7	<ul style="list-style-type: none"> Where required, interceptor drains will be installed in advance of any construction works commencing. 		
MM25	Check Dams	EIAR Chapter 4 Appendix 4-5 Appendix 4-7	<ul style="list-style-type: none"> 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. 		
MM26	Vegetation Filters	EIAR Chapter 4 Appendix 4-5 Appendix 4-7	<ul style="list-style-type: none"> Vegetation filters are the existing vegetated areas of land that will be used to accept surface water runoff from upgradient areas. The selection of suitable areas to use as vegetation filters will be determined by the size of the contributing catchment, slope and ground conditions. 		
MM27	Settlement Ponds	EIAR Chapter 4 Appendix 4-5 Appendix 4-7	<ul style="list-style-type: none"> Settlement ponds will be used to attenuate runoff from main works areas (i.e., from turbine base/hardstand areas, construction compounds, and the substation) of the site during the construction phase. Settlement ponds will be located towards the end of swales, close to where the water will be reconverted to diffuse sheet flow. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM28	Silt Bags	EIAR Chapter 4 Appendix 4-5 Appendix 4-7	<ul style="list-style-type: none"> ➤ 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 can also be used as an additional filtration measure downgradient of settlement ponds, wherever it is deemed appropriate, throughout the site. The water will flow, via a pipe, from the settlement 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 silt into the stream. 		
MM29	Siltbuster	Chapter 4 Appendix 4-5	<ul style="list-style-type: none"> ➤ A “siltbuster” or similar equivalent piece of equipment may be used to filter any water pumped out of excavation areas, if necessary, prior to its discharge to settlement ponds or swales. 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. ➤ The unit stills the incoming water/solids mix and routes it upwards between a set of inclined plates for separation. Fine particles settle onto the plates and slide down to the base for collection, whilst treated water flows to an outlet weir after passing below a scum board to retain any floating material. The inclined plates dramatically increase the effective settling area of the unit giving it a very small footprint on site and making it highly mobile. 		
MM30	Bottomless Box Culvert Crossing	EIAR Chapter 4 Appendix 4-5	<p>The standard construction methodology for the installation of a bottomless box culvert crossing is as follows:</p> <ul style="list-style-type: none"> ➤ The access road on the approach either side of the watercourse will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of each watercourse crossing. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ All drainage measures along the proposed road will be installed in advance of the works. ➤ A foundation base will be excavated to rock or competent ground with a mechanical excavator with the foundation formed in-situ using a semi-dry concrete lean mix. The base will be excavated along the stream bank with no instream works required. ➤ Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of a temporary pre-cast concrete bridge across the watercourse to provide temporary access for the excavator. Plant and equipment will not be permitted to track across the watercourse. ➤ Once the foundation base has been completed, the pre-cast bottomless culvert will be installed using a crane which will be set up on the bank of the watercourse and will be lifted into place from the bank with no contact with the watercourse. ➤ Once the crossing is in position stone backfill will be placed and compacted against the structure up to the required level above the foundations. ➤ Underground cabling ducting will be contained within the road make-up of the proposed crossing. <p>The watercourse crossing will be constructed to the specifications of the OPW bridge design guidelines ‘<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. Abutments will be constructed from precast units combined with in-situ foundations, placed within an acceptable backfill material.</p> <p>Confirmatory inspections of the proposed new watercourse crossing locations will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>A constraint/buffer zone will be maintained for all crossing locations where possible. In addition, measures which are outlined below will be implemented to ensure that silt laden or contaminated surface water runoff from the excavation work does not discharge directly to the watercourse.</p>		
MM31	Culvert Crossing	EIAR Chapter 4, 9. Appendix 4-5	<ul style="list-style-type: none"> ➤ All new proposed culverts and proposed culvert upgrades at field drain crossings required for the Proposed Wind Farm will be suitably sized for the expected peak flows in the watercourse. Some culverts may be installed to manage drainage waters from works areas of the Proposed Wind Farm, particularly where the waters must be taken from one side of an existing roadway 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 road 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM32	Silt Fences	EIAR Chapter 4, 9 Appendix 4-5 Appendix 4-7	<ul style="list-style-type: none"> ➤ Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the 50m buffer zone of a stream. Installation locations will be confirmed during the finalisation of detailed drainage design following a pre-construction survey by the appointed contractor. ➤ 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 'Control of Water Pollution from Linear Construction Projects' published by CIRIA (No. C648, 2006). Silt fence material will comprise Terrastop™ Premium material, and silt fences will be installed per the manufacturer's guidelines. Silt fences will be inspected on a regular basis to ensure that they are operating effectively. ➤ 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. 		
MM33	Sedimats	EIAR Chapter 4 Appendix 4-5 Appendix 4-7	<ul style="list-style-type: none"> ➤ 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. 		
MM34	Internal Cabling Trench	EIAR Chapter 4	<ul style="list-style-type: none"> ➤ Before works commence, surveying will take place along the proposed 33kV underground cabling, with all existing culverts identified. All relevant bodies i.e. ESB, Clare County Council etc. will be contacted and all drawings for all existing services sought. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		Appendix 4-5	<ul style="list-style-type: none"> ➤ When the cable is located on public roads, a traffic management plan will be set up prior to any works commencing. A road opening licence will be obtained where required and all plant operators and general operatives will be inducted and informed as to the location of any services. ➤ The cable ducts will be concrete surrounded where they pass under the public road and under drains or culverts. ➤ A tracked 360-degree excavator will then proceed to dig out the proposed trench, typically to a depth of 1200mm, within which the ducts will be laid. ➤ Trench supports will be installed, or the trench sides will be benched or battered back where appropriate and any ingress of ground water will be removed from the trench using submersible pumps, fitted with appropriate silt filtration systems, to prevent contamination of any watercourse. ➤ Once the trench has been excavated, a base-layer will be laid and compacted, comprising Clause 804, or 15 Newton CBM4 concrete as required. ➤ The ducting will be installed as per specification, with couplers fitted and capped to prevent any dirt etc. entering the duct. In poor ground conditions, the ends of the ducts will be shimmed up off of the bed of the trench, to prevent any possible ingress of water dirt. The shims will be removed again once the next length has been connected. Extreme care will be taken to ensure that all duct collars (both ends) are clean and in good condition prior to ducts being joined. ➤ As the works progress, the as-built location of the ducting will be recorded using a total station or GPS. ➤ As per the associated base-layer (Clause 804 material or 15 Newton CBM4 concrete) will be installed and compacted as per approved detail, with care not to displace the ducting. 		
MM35	Turbine/Met Mast Foundation Excavations	EIAR Chapter 4 Appendix 4-5	<ul style="list-style-type: none"> ➤ 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; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ 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; ➤ No material will be removed from the Proposed Wind Farm Site with excavated peat and spoil being transported to the identified peat and spoil management areas within the Proposed Wind Farm Site. ➤ 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; ➤ 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; ➤ 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. 		
MM36	Peat and Spoil Management	Chapter 4 Appendix 4-2 Appendix 4-5	<p>As identified in the Peat and Spoil Management Plan (Appendix 4-2), 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:</p> <ul style="list-style-type: none"> ➤ Excavated peat will be placed/spread across the clearfell areas around 4 no. of the Proposed Turbines. ➤ The peat placed will be restricted to a maximum height of 1.2m. Any weak/liquified peat (if any is encountered) will be placed within the proposed borrow pit and not stored within these areas. Spoil will be placed to a height of 1.5m in the spoil management area adjacent to the borrow pit. ➤ The placement of peat within the placement areas will require the use of long reach excavators and low ground pressure machinery in particular for drainage works. ➤ 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 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>placement of peat within the peat placement area progresses. This will reduce the likelihood of debris run-off and reduce the risk of instability of the placed peat.</p> <ul style="list-style-type: none"> ➤ 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. ➤ 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 placement areas. ➤ Movement monitoring instrumentation will be placed around the areas where peat has been placed. The locations where monitoring is required will be both upslope and downslope of the peat storage areas and should be monitored on a weekly basis during construction. ➤ Supervision by the Project Geotechnical Engineer will be undertaken during the works. ➤ An interceptor drain will be installed upslope of the designated peat placement 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. ➤ All the above mentioned general guidelines and requirements will be undertaken by the Contractor during construction. 		
MM37	Temporary Construction Compound	EIAR Chapter 4 Appendix 4-5	<ul style="list-style-type: none"> ➤ Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants. There will also be a water supply onsite for hygiene purposes, by way of a temporary storage tank. The construction compound will also include a bunded refuelling and containment area for the storage of oil, lubricants and site generators etc, and full retention oil interceptor. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ 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 in the northern section of the Proposed Wind Farm Site will be established using a similar technique as the construction of new floated road (Type D) as discussed above; ➤ The compound platform to the southwest of T05 will be established using a similar technique as the construction of new excavated roads (Type C) as discussed above; ➤ A layer of geo-grid will be installed 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; ➤ Areas within the compound will be constructed as site roads and used as vehicle hardstandings during deliveries and for parking; ➤ The compounds 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. 		
Operational Phase					
MM38	Wastewater Management	EIAR 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. The wastewater storage tank alarm will be part of a continuous stream of data from the Proposed Turbines, wind measurement devices and electricity substation extension 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 site to a licensed facility.		
Decommissioning Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM39	Decommissioning	EIAR Chapter 4 Appendix 4-6	A Decommissioning Plan has been prepared (Appendix 4-6). The Decommissioning Plan will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will agree with the competent authority at that time. The potential for effects during the decommissioning phase of the Proposed Project has been fully assessed in the EIAR.		
MM40	Decommissioning	EIAR Chapter 4 Appendix 4-6	<ul style="list-style-type: none"> ➤ Upon decommissioning of the Proposed Project, the turbines and met mast will be removed from the Proposed Wind Farm Site in a similar manner to how they will be transported to the site originally in extended articulated trucks. All above ground turbine and mast components would be separated and removed off-site for recycling. The turbines will be disassembled with a similar model of crane that was used for their erection. The turbines will be removed from site using the same transport methodology adopted for delivery to site initially. The turbine materials will be transferred to a suitable recycling or recovery facility. ➤ On the dismantling of turbines and met mast, it is not intended to remove the concrete foundation from the ground. It is considered that its removal will be the least preferred options in terms of potential effects on the environment. Therefore, the foundations of the 9 no. turbine and met mast will be covered with soil material. If there is usable soil or overburden material on the Proposed Wind Farm Site after construction, this material will be used. Alternatively, where material is not readily available on site, soil will be sourced locally and imported to site on heavy good vehicles (HGVs). The imported soil will be spread and graded over the foundation using a tracked excavator and revegetation enhanced by spreading of an appropriate seed mix to assist in revegetation and accelerate the resumption of the natural drainage management that will have existed prior to any construction. ➤ The internal underground cabling within the Proposed Wind Farm Site, connecting the turbines and the meteorological mast to the proposed extension to the existing Slievecallan 110kV substation, will be pulled from the cable duct using a mechanical winch which will extract the cable and re-roll it on to a cable drum. This will be undertaken at each of the 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>pull pits along the cabling route. The ground above original pulling pits will be excavated using a mechanical excavator and will be fully re-instated once the cables are removed.</p> <ul style="list-style-type: none"> ➤ The proposed extension to the 110kV electricity substation will remain in place as it will be part of the Electricity Grid under the ownership and control of the ESB Networks and EirGrid. 		
MM41	Refuelling	EIAR Chapter 4, 8, 9 Appendix 4-5	<ul style="list-style-type: none"> ➤ Road-going vehicles will be refuelled off-site wherever possible. ➤ On-site refuelling of machinery will be carried out at dedicated refuelling locations using a mobile double-skinned fuel bowser. ➤ 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 an appropriately bounded area when not in use and only designated trained and competent operatives will be authorised to refuel plant on site. ➤ 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 used during refuelling operations as required. <p>The following mitigation measures are proposed to avoid release of hydrocarbons at the site:</p> <ul style="list-style-type: none"> ➤ 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ 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 Proposed Wind Farm 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 to deal with accidental spillages will be contained within Section 6.1.4 of the CEMP. Spill kits will be available to deal with accidental spillages. 		
EIAR Chapter 5: Population and Human Health					
Pre-construction Phase					
MM42	Human Health	EIAR Chapter 5	<ul style="list-style-type: none"> ➤ 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. 		
MM43	Traffic and Transport	EIAR Chapter 5	<ul style="list-style-type: none"> ➤ Prior to commencing Proposed Grid Connection works in the local road network in the townland of Knockalassa, goal posts will be established under the 110kV and 38kV overhead lines. They will remain in place for the duration of the works in this area. The goal posts will not exceed a height of 4.2 metres, unless specifically agreed with ESB Network. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ A Traffic Management Plan (TMP) has been developed in order to minimise any potential effect on the local population during the construction phase of the Proposed Project due to traffic. ➤ Prior to commencement of any Proposed Grid Connection works, the occupants of dwellings in the vicinity of the proposed works will be contacted and the scheduling of works will be made known. <ul style="list-style-type: none"> ○ Local access to properties will 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 <p>It is not anticipated that any section of the public road network will be closed during transport of turbines, although there will be some delays to local traffic at pinch points. During these periods it may be necessary to operate local diversions for through traffic. All deliveries comprising abnormally large loads where required will be made outside the normal peak traffic periods, usually at night, to avoid disruption to work and school-related traffic.</p>		
Construction Phase					
MM44	Land Use Patterns & Activities	EIAR Chapter 5	<ul style="list-style-type: none"> ➤ The construction of the Proposed Grid Connection Site 33kV underground cabling will be undertaken in a rolling construction method with 100m of road constructed and back filled each day providing access in the evenings and night hours along the Proposed Grid Connection Site. ➤ A Traffic Management Plan, agreed with the Local Authority, will be in place for the construction phase of the Proposed Grid Connection underground cabling route. The Traffic Management Plan is included as Appendix 15-2 to this EIAR. <p>The identified 20.7ha of coniferous forestry that will be permanently felled for the built infrastructure footprint of the Proposed Project, will be replaced or replanted on a hectare for hectare basis, and an additional 123.3ha will be permanently felled as part of the hen harrier enhancement plan included in Appendix 6-4 Biodiversity Management and Enhancement Plan</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			(BMEP), which will be subject to the condition of any felling licence that will be issued in respect of the Proposed Project		
MM45	Human Health	<p>ELAR Chapter 5</p> <p>Appendix 4-5</p>	<p>The Proposed Project will be constructed, operated and decommissioned in accordance with all relevant Health and Safety Legislation, including:</p> <ul style="list-style-type: none"> > 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). <p>The following measures below are also detailed in Chapter 18 Schedule of Monitoring and Mitigation Measures.</p> <ul style="list-style-type: none"> > 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 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>addressed by restricting Site access during construction. Fencing will be erected in areas of the Site where uncontrolled access is not permitted.</p> <ul style="list-style-type: none"> ➤ Goal posts will be established, where necessary, under overhead electricity lines for the entirety of the construction phase of the Proposed Wind Farm Site. ➤ 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 through 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. ➤ 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 2021'⁵. This will encompass the use of all necessary Personal Protective Equipment and adherence to the Site Health and Safety Plan. 		

⁵ 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

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>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):</p> <ul style="list-style-type: none"> ➤ 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. <p>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):</p> <ul style="list-style-type: none"> ➤ 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; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ○ 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 <p>➤ Notify the Authority and the client of non-compliance with any written directions issued.</p>		
MM46	Air Quality: Dust and Exhaust Emissions	EIAR Chapter 5, 10	<p>Truck wheels will be washed to remove mud and dirt before leaving. All plant and materials vehicles shall be stored in the compound area or other dedicated areas. Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. Construction traffic will be restricted to defined routes, and a speed limit will be implemented.</p> <p>The active construction area along the proposed underground cabling route will be small, ranging from 100m in length at any one time. Should separate crews be used during the construction phase they will generally be separated by 1-2km. All construction machinery will be maintained in good operational order while on-site, minimising any emissions that are likely to arise. Aggregate materials for the construction of the cabling route will be sourced locally to reduce the amount of emissions associated with vehicle movements. Potential dust emissions during the construction period will not be significant and will be relatively short-term in duration.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			All mitigation as outlined in Chapter 10 Air Quality will be implemented in order to reduce insofar as possible, impacts on air quality in the vicinity of Proposed Project construction works.		
MM47	Water Quality	EIAR Chapter 5	<ul style="list-style-type: none"> ➤ A bespoke drainage design which includes but is not limited to interceptor drains, check dams, swales and ponds will be implemented on the Site, please see Section 4.6 in Chapter 4 for details on the different type of drainage measures to be implemented on the Site. Chapter 9 of this EIAR details all best practice and mitigation measures to minimise the potential for entrainment of suspended sediment or potential hydrocarbon leak. Please see Chapter 9 for details and Chapter 18 for a full list of mitigation and monitoring measures for the Proposed Project. 		
MM48	Noise and Vibration	Chapter 5, 12	<p>Best practice measures for noise control will be adhered to on-site during the construction phase of the Proposed Project to impacts associated with this phase of the development. Please refer to Chapter 12: Noise and Vibration and Chapter 18 Schedule of Mitigation and Monitoring Measures for a full list of measures.</p> <ul style="list-style-type: none"> ➤ No plant used on site will be permitted to cause an on-going public nuisance due to noise. ➤ 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ 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 <i>Code of practice for noise and vibration control on construction and open sites – Noise</i>. ➤ 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. 		
MM49	Traffic and Transport	Chapter 5, 15	<ul style="list-style-type: none"> ➤ A complete Traffic and Transport Assessment (TTA) of the Proposed Project has been carried out by Alan Lipscombe Traffic and Transport Consultants. The full results of the TTA are presented in Chapter 15: Material Assets. 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM50	Major Accidents & Natural Disasters	Chapter 5, 16	<ul style="list-style-type: none"> ➤ 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 Hydrology and Hydrogeology. 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. <p>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</p>		
Operational Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM51	Property Values	EIAR Chapter 5	<ul style="list-style-type: none"> ➤ All mitigation relevant to property values, outlined above and the corresponding chapters: Chapter 10 Air Quality, Chapter 12 Noise and Vibration, Chapter 13 Landscape, and Chapter 15 Material Assets, will be implemented in order to reduce insofar as possible, impacts on property values at properties located in the vicinity of the Proposed Project construction works. ➤ The Proposed Project has been designed in accordance with the parameters set out in the Guidelines (DoEHLG, 2006) and with cognisance of the Draft Guidelines (DoHPLG, 2019). 		
MM52	Human Health	EIAR Chapter 5	<ul style="list-style-type: none"> ➤ 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: <ul style="list-style-type: none"> ○ 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ The proposed extension to the existing Slievecallan 110kV substation, which will be operated by EirGrid will be locked and fenced off from public access. The proposed substation extension 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: <ul style="list-style-type: none"> ○ 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. <ul style="list-style-type: none"> ○ 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. 		
MM53	Residential Amenity	EIAR 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 delivery route and construction materials haul route, Proposed Grid Connection Site and the Proposed Enhancement Site.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM54	Shadow Flicker	EIAR Chapter 5	<p>Where daily or annual shadow flicker exceedances are predicted at any inhabitable or third-party dwelling of the identified 15 no. sensitive receptors, a site visit will be undertaken firstly to determine the presence of existing screening and window orientation at each potentially affected property. This will determine if the receptor has an actual line of sight to any turbine and actual potential for shadow flicker to occur. Once this exercise is completed and all of the potentially affected properties, the following measures will be employed.</p> <p><u>Screening Measures</u></p> <p>In the event of an occurrence of shadow flicker exceeding guideline threshold values of 30 minutes per day at residential receptor locations, mitigation options will be discussed with the affected homeowner, including:</p> <ul style="list-style-type: none"> ➤ Installation of appropriate window blinds in the affected rooms of the residence; ➤ Planting of screening vegetation; ➤ Other site-specific measures which might be agreeable to the affected party and may lead to the desired mitigation. <p>If agreement can be reached with the homeowner, then it would be arranged for the required mitigation to be implemented in cooperation with the affected party as soon as practically possible and for the full costs to be borne by the wind farm operator.</p> <p><u>Wind Turbine Control Measures</u></p> <p>If it is not possible to mitigate any identified shadow flicker limit exceedance locally using the measures detailed above, wind turbine control measures will be implemented.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>Wind turbines can be fitted with shadow flicker control units to allow the turbines to be controlled to prevent the occurrence of shadow flicker at properties surrounding the wind farm. The shadow flicker control units will be added to any required turbines.</p> <p>A shadow flicker control unit allows a wind turbine to be programmed and controlled using the wind farm's Supervisory Control and Data Acquisition (SCADA) system to change a particular turbine's operating mode during certain conditions or times, or even turn the turbine off if necessary.</p> <p>All predicted incidents of shadow flicker can be pre-programmed into the wind farm's control software. The wind farm's SCADA control system can be programmed to shut down any particular turbine at any particular time on any given day to avoid excessive shadow flicker occurrences at properties which are not naturally screened or cannot be screened with measures outlined above. Where such wind turbine control measures are to be utilised, they need only be implemented when the specific combined circumstances occur that are necessary to give rise to the shadow flicker effect in the first instance. Therefore, if the sun is not shining on a particular day that shadow flicker was predicted to occur at a nearby property, there would be no need to shut down the relevant turbines that would have given rise to the shadow flicker at the property. Similarly, if the wind speed was below the cut-in speed that caused the turbine rotor to rotate and give rise to a shadow flicker effect at a nearby property, there would be no need to shut down the relevant turbines that otherwise would have caused shadow flicker.</p> <p>The atmospheric variables that determine whether shadow flicker will occur or not, are continuously monitored at the Proposed Wind Farm Site and the data fed into the wind farm's SCADA control system. The strength of direct sunlight is measured by way of photocells, and if the sunlight is of sufficient strength to cast a shadow, the shadow flicker control mechanisms come into effect. Wind speed and direction are measured by anemometers and wind vanes on each turbine and on the wind farm's met mast, and similarly, and if wind speed and direction is</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>such that a shadow will be cast, the shadow flicker control mechanisms come into effect. The moving blades of the turbine will require a short period of time to cease rotating and as such there may be a very short period (less than 3 to 5 minutes) during which the blades are slowed to a complete halt. The turbines giving rise to shadow flicker may be turned off on different days to prevent excessive wear and tear on any single turbine.</p> <p>In order to ensure that the model and SCADA system is accurate and working well a site visit will be carried out to verify the system. The shadow flicker prediction data will be used to select dates on which a shadow flicker event could be observed at one or multiple affected properties and the following process will be adhered to.</p> <ol style="list-style-type: none"> 1. Recording the weather conditions at the time of the site visit, including wind speeds and direction (i.e. blue sky, intermittent clouds, overcast, moderate breeze, light breeze, still etc.). 2. Recording the house number, time and duration of site visit and the observation point GPS coordinates. 3. Recording the nature of the sensitive receptor, its orientation, windows, landscaping in the vicinity, any elements of the built environment in the vicinity, vegetation. 4. In the event of shadow flicker being noted as occurring the details of the duration (times) of the occurrence will be recorded. 5. The data will then be sent to the wind farm operational team to confirm that the model and SCADA system are working. 6. Following 12 months of full operation of the Proposed Project a report can be prepared for the Local Authority describing the shadow flicker mitigation measures used at the wind farm and confirming the implementation and successful operation of the system. 		
<p>EIAR Chapter 6 Biodiversity</p>					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Pre-Construction					
MM56	Invasive Species Management	EIAR Chapter 6 Appendix 6-5	<p>During field surveys, a search for Invasive Alien Species (IAS) listed under the ‘Third Schedule’ of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) and the ‘First Schedule’ of the European Union (Invasive Alien Species) Regulations 2024 (S.I. 374 of 2024) was conducted.</p> <p>Rhododendron (<i>Rhododendron ponticum</i>) was recorded at 19 locations within the Site. Prior to the commencement of any works, the following site setup procedures will be carried out:</p> <ul style="list-style-type: none"> ➤ A pre-commencement survey for Rhododendron will be undertaken by a fully qualified ecologist to determine the locations and extent of the species within the Site and to determine whether there have been any changes in the extent of the infestation since the undertaking of surveys in 2024, 2025 and 2026. ➤ The locations and extent of Rhododendron within the Site will be clearly marked out using hazard tape to ensure they are not disturbed. A 10m buffer zone (Higgins, G.T. 2008) surrounding each stand will also be applied using temporary fencing, to avoid disturbance of potentially contaminated soils. <p>Given the largely interspersed recordings of this species within the Site, it is proposed to treat the plant <i>in-situ</i>. The recommended option for <i>in-situ</i> treatment is to manually remove the upper parts of the plant and apply the Ecoplug method (www.landscapedepot.ie) as to avoid spray drift and to minimise the potential for spraying of non-target species. The Ecoplug method is outlined below.</p> <ul style="list-style-type: none"> ➤ Cut the tree/plant as close to the ground as possible. This should be carried out from October to early March, outside the bird nesting season. ➤ The cut material can be stacked and stored on site, used as firewood or mulched. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ A 30 mm hole will be drilled into the remaining stump and the Ecoplug will be inserted into the hole until it is flush with the top of the stump. ➤ Where immature plants occur, hand pulling can be undertaken at any time of the year and left to dry out on an impermeable surface. <p>Where the Ecoplug method is unsatisfactory, such as with smaller saplings, manual extraction of the root/stump from the ground is recommended. The following methods for root extraction are outlined below.</p> <ul style="list-style-type: none"> ➤ Cut the tree/plant as close to the ground as possible. This should be carried out from October to early March, outside the bird nesting season. ➤ The root/stump will be removed from the ground using hand tool or an excavator. ➤ The cut material can be stacked and stored on the Site, used as firewood or mulched. <p>The root/stump will be placed on an impermeable surface such as pallettes or a radon barrier membrane and left to dry out.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM57	Otter	EIAR Chapter 6	<p>Disturbance/Mortality</p> <p>Taking a precautionary approach, and due to the time that can elapse between the original surveys, any future planning consent and construction, a pre-construction otter survey will be carried out by a qualified ecologist to identify the presence of any breeding sites within the Site, that may have been established in the intervening period.</p> <p>As such, prior to the commencement of construction works associated with the installation of watercourse crossings, the following measures will be undertaken for the avoidance of disturbance/displacement and direct mortality and to ensure that no otter holts/breeding sites have been established since the original surveys undertaken (TII, 2008b):</p> <p>From a precautionary basis, a pre-commencement otter survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works.</p> <p>Should the surveys identify the presence of an otter holt, the following measures will be undertaken.</p> <ul style="list-style-type: none"> ➤ A National Parks and Wildlife Service derogation licence will be applied for (although compliance with such a licence has not been relied on in this assessment). ➤ No works will be undertaken within 150m of any holts at which breeding females or cubs are present. ➤ No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance will also not take place within 15m of such holts, except under licence (TII, 2008b). ➤ All of the above works will be undertaken or supervised by an appropriately qualified ecologist. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>Currently based on the finding of the surveys and current information regarding the Site, no derogation licence is required for this application, as no breeding sites have been recorded in close proximity to the Site. However, should the pre-commencement surveys identify a new breeding site and exclusion is required, a derogation licence will be obtained place from the NPWS prior to any works being carried out.</p> <p>Habitat Degradation (impacts on water quality)</p> <p>The potential for deterioration of water quality, and degradation of otter habitat, has been considered in Table 6-12 of Chapter 6, which assesses the potential for significant impacts on aquatic receptors, and provides mitigations to prevent any such effects.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM58	Badger	EIAR Chapter 6	<p>Disturbance/Mortality</p> <p>Due to time that can elapse between the original surveys, any future planning consent and construction, a pre-construction badger survey will be carried out to identify the presence of any setts that may have been established in the intervening period. Any setts identified within 150m of the Project Footprint will subsequently be monitored for a minimum period of 2 weeks using remote cameras in order to ascertain use by badgers and levels of activity. If an active badger sett is identified and works can be undertaken safely (as to avoid sett collapse) then an exclusion zone will be set up around the sett as follows:</p> <ul style="list-style-type: none"> ➤ Exclusion zone fencing and appropriate signage will be put in place between working areas and badger sett exclusion zones to ensure that there will be no encroachment of the badger sett exclusion zones by construction activities. <p>If a newly established and active sett was identified within an area where works could not avoid direct impacts on the sett, then the sett would likely need to be excluded prior to works commencing. This would need to be undertaken in line with current guidelines by an appropriately qualified ecologist in advance of construction works commencing and in consultation with NPWS.</p> <p>Where open excavations are left unattended, a ramp will be placed from the pit floor to ground level to allow safe egress of the excavation should any badger fall in. The bottom of the ramp will weighed down or secured, to ensure it remains in place should the excavation fill with water.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM59	Marsh Fritillary	EIAR Chapter 6	<p>Direct Effects/Mortality</p> <ul style="list-style-type: none"> ➤ A pre-commencement survey for marsh fritillary larvae will be undertaken at the suitable time of year (i.e. August – September) in advance of construction commencing. This pre-commencement survey will cover the entirety of the Project Footprint. ➤ If active larval webs are recorded within the Project Footprint, these webs will be translocated by a suitably qualified ecologist to adjacent suitable existing foraging habitat outside of the Project Footprint. This will be achieved by translocating a sod of earth with entire, intact Devil’s-bit scabious plants upon which the larvae are feeding. ➤ Larval webs and associated food plants will only be translocated by a suitable qualified Ecologist or the appointed Ecological Clerk of Works (ECoW) to suitable supporting marsh fritillary habitat a minimum of 20m from the Project Footprint. ➤ Existing breeding areas will be fully fenced off with a minimum exclusion zone distance of 5 metres to construction works. ➤ ECoW supervision will be required for construction of components near existing breeding areas. <p>Where suitable marsh fritillary habitat occurs in close proximity to Project Footprint side casting of material will be to the opposite side of the proposed infrastructure to where the suitable habitat occurs.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM60	Bats	Appendix 6-1	<p>Loss or Damage to Commuting and Foraging Habitat</p> <p>No mitigation required. However, taking a precautionary approach, standard best practice measures, as detailed in Section 6 of Appendix 6-1, will be implemented.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM61	Red Squirrel/Pine Marten	EIAR Chapter 6	<p>Disturbance/Mortality</p> <p>Due to time that can elapse between the original surveys, any future planning consent and construction, a pre-construction survey for pine marten/red squirrel will be carried out to identify the presence of any new breeding sites. These surveys will focus on areas of Conifer plantation (WD4) to be felled and all suitable habitat within 50m of the felling blocks. Any potential breeding sites should be monitored using camera traps to ascertain if they are active. Surveys will be undertaken in line with Nature Scot and TII guidelines.</p> <p>Should active dreys/dens be identified within the blocks to be felled, the following mitigations and best practice procedures will be followed to ensure that no breeding site for either red squirrel or pine marten is impacted:</p> <ul style="list-style-type: none"> ➤ Felling works will be undertaken in October–January inclusive, as this will avoid the main breeding season (February–September) when vulnerable young are most likely to be found within breeding sites for both species. ➤ Any breeding sites identified within the 50m buffer that wouldn't be directly affected by felling works, but are vulnerable to disturbance related impacts, will be clearly marked out with an exclusion zone, and works/access through these areas will be avoided. ➤ Plant machinery will be turned off when not in use. <p>Operating machinery will be restricted to the Proposed Project works site area (and outside any exclusion zone)</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM62	Reptiles and Amphibians	EIAR Chapter 6	<p>Disturbance/Mortality</p> <p>Prior to construction of the Proposed Project, pre-commencement surveys for viviparous lizard, common frog, and smooth newt will be undertaken within potential supporting habitat identified within the Project Footprint. Surveys will be undertaken by a suitably qualified ecologist and during the optimal season for each species, as per TII (2008) guidelines.</p> <p>Any individuals or population of these species will then be translocated outside of the Project Footprint to other areas of suitable habitats.</p> <p>An Ecological Clerk of Works will also be appointed for the construction works, who will translocate any further individuals recorded during the construction works.</p>		
Construction Phase					
MM63	Surface Watercourses and Sensitive Aquatic Faunal Species	EIAR Chapter 6, 9	<p>Proposed Wind Farm Site and Proposed Enhancement Site</p> <p>Detailed mitigation measures in relation to the protection of surface and ground water during construction are provided in Section 9.5.2 of Chapter 9: Hydrology and Hydrogeology. In summary the key mitigation measure during the construction phase is the avoidance of sensitive hydrological features, by application of suitable buffer zones. A self-imposed buffer zone of</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>50m has been put in place for streams and rivers within the Proposed Wind Farm Site where possible. Manmade forestry drains at the Site are not considered a hydrological constraint and therefore no buffering of forestry drains has been undertaken. All of the key infrastructure areas are located significantly away from watercourses with the exception of the upgrades to access track and water crossings. Detailed control measures in relation to the protection of surface and ground waters during construction are detailed in Section 9.5.2. of Chapter 9. In addition, the Construction Environmental Management Plan (CEMP) that is provided as Appendix 4-5 of the EIAR provides the details of exactly how the measures will be implemented during construction.</p> <p>A drainage management plan for the Proposed Project is provided in Section 9.4.2 of Chapter 9: Hydrology and Hydrogeology, as well as in Section 3.2.4 of the CEMP. This plan provides details of how water quality will be protected during the construction of the Proposed Project. The maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works with regular inspections of all installed drainage systems undertaken throughout the Site.</p> <p>Proposed Grid Connection Site Mitigations around the protection of watercourses from the construction of the proposed 33kV underground cabling are provided in Section 9.5.2.13 of Chapter 9. The mitigations include for:</p> <ul style="list-style-type: none"> ➤ Pre-commencement of works ➤ Underground cabling watercourse crossing works ➤ Fracture Blow-out (Frac-out) Prevention and Contingency Plan for HDD 		
MM64	Bats	Appendix 6-1	<p>The below describes the best practice and site-specific mitigation measures that are in place to avoid and reduce the potential for significant effects on local bat populations.</p> <p><u>Noise Restrictions</u></p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>During the construction phase, plant machinery will be turned off when not in use and all plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001, as amended).</p> <p><u>Lighting Restrictions</u></p> <p>Where lighting is required, directional lighting will be used to prevent overspill on to woodland/forestry edges and linear features. Exterior lighting, during construction and post construction, will be designed to minimize light spillage, reducing the effect on surrounding habitat features and bat activity. Lighting will be directed away from mature trees and treelines around the periphery of the site boundary to minimize disturbance to bats.</p> <p>Directional accessories will be used to direct light appropriately, such as light shields (Stone, 2013). All luminaires will be of a type that prevents upward and lateral spillage. The proposed lighting will comply with ILP Guidance Note 08/23 – Bats and Artificial Lighting at Night (ILP, 2023).</p> <p>The applicant also commits to the Dark Sky Ireland Lighting Recommendations, ensuring that:</p> <ul style="list-style-type: none"> ➤ Every light is justified; ➤ Light is used only when necessary; ➤ It is directed where needed; ➤ Light intensity is minimised; ➤ Spectra are adapted to the environment; ➤ White light sources will have a “warm” colour temperature (less than 3000K). <p><u>Bat Felling Buffers</u></p> <ul style="list-style-type: none"> ➤ In accordance with NatureScot (2021) and NIEA (2021) guidance, a minimum 50 m buffer is applied between turbine blade tips and habitat features used by bats (e.g. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>hedgerows, treelines). Although increased buffers of 100–200m are recommended around woodland by Eurobats Publication No. 6 and NIEA, these recommendations are not currently supported by empirical evidence from the UK or Ireland and are not routinely applied in wind farm planning.</p> <ul style="list-style-type: none"> ➤ NatureScot recommends that a distance of 50m between turbine blade tip and nearest woodland (or other key habitat features) is adequate mitigation. This 50m buffer will be implemented from the outset and monitored as per the post-construction monitoring. The success of the buffer mitigation will be assessed as part of post construction monitoring and updated where necessary. ➤ For the Proposed Wind Farm Site, a 50 m buffer between turbine blade tip and the nearest habitat feature has been implemented, based on a conservative worst-case turbine specification (blade length: 75 metres; hub height: 100metres; total height: 175m). Buffer distances were calculated using the Natural England formula (NatureScot, 2021) as illustrated in Plate 6-1 and have been incorporated into the turbine layout. <p>Removal of areas of conifer plantation will be required to provide the necessary bat buffers within the Proposed Wind Farm Site. These vegetation-free areas (i.e. less than 2m in height) will be maintained for the duration of the operational phase and form part of the overall collision-risk mitigation strategy for bats.</p>		
MM65	Marsh Fritillary	EIAR Chapter 6	<p>Dust Mitigation</p> <p>The following mitigation applies to construction areas within 20m of potential marsh fritillary habitat (in line with Table 4 of Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction 2024):</p> <ul style="list-style-type: none"> ➤ Groundworks (i.e. works with potential to create dust) associated with the Proposed Project will be fully supervised by an Ecological Clerk of Works (ECoW). 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ The ECoW will regularly monitor adjacent marsh friterrary habitat on a daily basis for potential signs of dust deposition or any other habitat degradation. Dust level thresholds and weather will also be monitored. ➤ 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. ➤ The following additional dust mitigation measures, as set out in Chapter 10: Air Quality, will apply: <ul style="list-style-type: none"> ➤ 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. ➤ Turbine components and construction materials will be transported to the Proposed Wind Farm Site on specified haul routes only, as agreed with the local authority. ➤ Construction materials for the Proposed Project will be sourced locally from the onsite borrow pit. ➤ 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. ➤ The transport of construction materials around the onsite borrow pit will be covered by tarpaulin where necessary. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ 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 Site to reduce the amount of emissions associated with vehicle movements ➤ A CEMP will be in place throughout the construction phase (see Appendix 4-5). <p>Loss of Suitable Breeding Habitat</p> <p>As part of the proposed BMEP (Appendix 6-4) it is recommended to manage approx. 20 ha of agricultural wet grassland into species rich grassland, within which frequent Devil's-bit scabious has been recorded. Additionally, within the Proposed Wind Farm Site, approx. 29.7 ha of identified potential supporting habitat for marsh fritillary (under grazed) will be subject to adaptive grazing regime, which will be monitored and adjusted to enhance existing habitat within the Site.</p> <p>Full details on habitat establishment, as well as operational, monitoring are provided in Appendix 6-4.</p>		
MM66	Invasive Species – Site hygiene and biosecurity measures	EIAR Chapter 6	<p>The following site hygiene and biosecurity measures will be adhered to for the management of invasive species within the entire Proposed Project site:</p> <ul style="list-style-type: none"> ➤ No ground works will take place on site prior to the application of this site-specific ISMP. The ISMP will ensure all measures are taken to avoid the spread of species discussed. ➤ All works in relation to the invasive species will be supervised by an ECoW. ➤ All staff will be given a Toolbox Talk, by a suitably qualified person or ecologist, on invasive species removal in relation to Rhododendron and their management on site. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ The contractor will assign a member of their team as Environmental Officer to ensure the management plan is adhered to throughout the proposed works. ➤ A designated bio-secure area/exclusion zone will be set up at recorded invasive species locations to prevent disturbance in these areas. Invasive species will be marked with hazard tape in order to identify the species prior to vegetation clearance works and to keep it separate from other brash material. ➤ All machinery should be thoroughly cleaned down prior to arriving on the site to avoid the potential spread of invasive species from elsewhere. ➤ Machinery that is used for excavation and onsite removal of invasive material will not be used for any other works until they are fully cleaned down and then visually inspected by a specialist to ensure no fragments of invasive plant material are present. ➤ Prior to leaving the invasive species exclusion zones, all boots and clothing will be thoroughly brushed down to remove any contaminated material prior to leaving the area. ➤ As a precautionary measure, machinery will be thoroughly cleaned down before exiting the site to prevent potential spread of invasive species elsewhere. ➤ Clean down will be carried out using brushes and shovels and power washing will be avoided insofar as possible. This is to prevent potentially contaminated run-off spreading outside the Site. ➤ Material used for tracking machinery out of the contaminated areas on site e.g. plywood will be thoroughly cleaned down under supervision of the ECoW prior to removal off site. ➤ Any soil and topsoil required on the Site will be sourced from a stock that has been screened for the presence of any invasive species and where it is confirmed that none are present. ➤ Any material imported to the site should be screened for invasive species by a suitably qualified ecologist before transportation to the Site. 		
Operational Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM67	Bats	EIAR Chapter 6 Appendix 6-1	<p>Blade Feathering</p> <p>NIEA Guidelines also recommend that, in addition to buffers applied to habitat features, all wind turbines are subject to ‘feathering’ of turbine blades when wind speeds are below the cut-in speed of the proposed turbine. This means that the turbine blades are pitched at 90 degrees or parallel to the wind to reduce their rotation speed to below two revolutions per minute while idling. This measure has been shown to significantly reduce bat fatalities (by up to 50%) in some studies (NIEA, 2021).</p> <p>Blade feathering below the turbine cut-in speed is expected to be implemented automatically through the turbine control system. Feathering will be limited to periods and locations as follows:</p> <ul style="list-style-type: none"> ➤ Seasonal Application: <p>Feathering will be applied during the main bat activity season (typically April–October) when bats are active and at potential increased risk of collision. Blade feathering will not be applied during winter months (November - March) when bats are largely inactive.</p> <ul style="list-style-type: none"> ➤ Spatial Targeting: <p>Feathering will be implemented only at turbines located in areas of high bat activity, as identified through baseline surveys. Turbines positioned in habitats unsuitable for bats (e.g., extensive bare peat, exposed upland areas with no foraging or commuting value) will not require feathering at low wind speeds. Section 6.1.3 of Appendix 6-1 of the EIAR outlines areas which recorded high bat activity for high collision risk bat species.</p> <p>Should any variations in activity or risk levels be identified during post-construction monitoring, this will be adjusted accordingly as part of the mitigation and monitoring strategy</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p><u>Operational Monitoring</u></p> <p>Year 1</p> <p><u>Bat Activity Surveys</u></p> <p>The post-construction surveys will be carried out as per the pre-construction survey effort. Static monitoring will take place at each turbine during the bat activity season (between April and October) (NatureScot, 2021, NIEA, 2021). Full spectrum recording detectors will be utilised for the same duration as during pre-application surveys and at the same density (NatureScot, 2021). Walked survey transects will also be conducted.</p> <p>Key weather parameters and other factors that are known to influence collision risk will be monitored and shall include:</p> <ul style="list-style-type: none"> ➤ Windspeed in m/s (measured at nacelle height) ➤ Temperature (°C) ➤ Precipitation (mm/hr) <p><u>Carcass Searches</u></p> <p>Carcass searches, to monitor and record bat fatalities, shall be conducted at each turbine in accordance with most recent NatureScot/NIEA Guidance. This shall include searcher efficiency trials and an assessment of scavenger removal rates to determine the appropriate correction factor to be applied in relation to determining an accurate estimate of collision mortality. Surveys should cover all activity seasons and the use of a trained dog detection team will be carried out to ensure maximum efficiency.</p> <p>Years 2 & 3</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>Monitoring surveys shall continue in Year 2 and 3, and where a curtailment requirement has been identified, the success of the curtailment strategy shall be assessed in line with the baseline data collected in the preceding year(s). The performance of any curtailment programme in terms of its ability to respond to the changes in bat abundance based on temperature and wind speed shall be analysed to confirm it is neither significantly over- nor under- curtailing during different periods of bat activity.</p> <p>At the end of each year, the efficacy of any mitigation/curtailment programme shall be reviewed, and any identified efficiencies incorporated into the programme. The requirement for continued post-consent monitoring will also be considered. Should no bat fatalities be recorded in Year 1, curtailment (where applicable) in Year 2 and Year 3 could be reduced/re-evaluated or removed with monitoring continuing to inform this strategy.</p>		
EIAR Chapter 7 Ornithology					
Pre-Construction Phase					
MM69	Birds	EIAR Chapter 7	<ul style="list-style-type: none"> ➤ 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). ➤ 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). 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>➤ This monitoring will involve surveying onsite and to a 500m radius of the development footprint/works areas. 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.</p> <p>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.</p>		
Construction Phase					
MM70	Birds	EIAR Chapter 7	<p>➤ 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.</p>		
MM71	Birds	EIAR Chapter 7	<p>➤ Works will commence outside the bird nesting season (1st of March to 31st of August inclusive). In the event that construction works to 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 7.8.1 of Chapter 7.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ Significant impacts on hen harrier were predicted, as such a BMEP will be implemented. Please see Section 7.6.3 of Chapter 7 for further details. ➤ Where sections of woody vegetation are removed for the purposes of the junction and road upgrades, all work will be undertaken in full compliance with Section 40 of the Wildlife Act 1976 – 2022 and areas 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. Please see Chapter 12: Noise and Vibration for more detail associated with noise during the construction phase. ➤ Water protection measures will be implemented around existing watercourses as outlined in Chapter 9, to protect the use of watercourses by birds. 		
MM72	Hen Harrier	EIAR Chapter 7	<ul style="list-style-type: none"> ➤ A comprehensive Hen Harrier Habitat Enhancement Plan is proposed. ➤ This plan will be implemented prior to the construction of the Proposed Project. The plan measures will be implemented as follows. ➤ Forestry Areas <ol style="list-style-type: none"> 7. The Applicant will employ a suitably qualified contractor(s) to carry out the measures as detailed in Section 4.2.2 of Appendix 6-4. 8. A meeting will be held with the contractor to outline the general aims, objectives and requirements of the BMEP for all enhancement areas. 9. Site-specific felling methods will be devised between the Applicant and their forestry consultant. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ Farmland Areas <ul style="list-style-type: none"> 10. The Applicant will engage a suitably qualified contractor to carry out the measures as detailed in Section 4.2.3 of Appendix 6-4. 11. A meeting will be held with the contractor to outline the general aims, objectives and requirements of the plan for all enhancement areas. ➤ A farm plan will be prepared which will outline the individual prescriptions required to ensure the implementation of this plan. The plan will include a map of the landholding, and a prescriptive list of actions to be undertaken, and the time of year when the necessary works and management measures are to be undertaken. It is proposed that a suitably qualified environmental scientist or ornithologist/ecologist will be engaged by the Applicant to oversee the implementation of this plan generally and the farm management plan in particular. The implementation will likely require the input of agricultural advisors including with regard to appropriate stocking levels. 		
Operational Phase					
MM73	Birds	EIAR Chapter 7	<ul style="list-style-type: none"> ➤ Operational monitoring will be in line with guidelines issued by the NatureScot (NatureScot, 2009 and NatureScot, 2025a). Surveys will be undertaken in Years 1, 2, 3, 5, 10 and 15 of the wind farm's lifetime. ➤ Operational monitoring will include the following survey methods: ➤ Flight activity surveys: vantage point surveys. ➤ Distribution and abundance surveys: breeding raptor surveys. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Targeted bird collision surveys (corpse searches) will be undertaken by a trained dog and handler. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust.		
MM74	Hen Harrier	EIAR Chapter 7	<p>The Proposed Hen Harrier Habitat Enhancement Areas will be the subject of annual monitoring to assess the effectiveness of the measures proposed and employed and to contribute to advances in habitat management methods, which can be applied to future similar projects. The monitoring can also aid adaption and implementation of improved methods and measures as they emerge, or intensification of successful measures deployed from farm plan to farm plan. Please refer to Appendix 6-4 for further details.</p> <p>The monitoring measures will include the following during the breeding season:</p> <ul style="list-style-type: none"> ➤ Hen harrier surveys of each of the Proposed Hen Harrier Habitat Enhancement Areas. ➤ Passerine point counts at each of the Proposed Hen Harrier Habitat Enhancement Areas. ➤ Habitat mapping and scoring at each of the Proposed Hen Harrier Habitat Enhancement Areas. ➤ Vegetation sampling at each of the Proposed Hen Harrier Habitat Enhancement Areas. 		
EIAR Chapter 8 Land, Soils and Geology					
Construction Phase					
MM76	Peat and Subsoil Excavation	EIAR Chapter 4, 8	<ul style="list-style-type: none"> ➤ Placement of turbines and associated infrastructure in areas with shallow peat where possible (this has been confirmed by extensive site investigations); ➤ Use of the existing road network to reduce peat excavation and borrow pit volumes; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ The peat and subsoil which will be removed during the construction phase will be localised to the Proposed Project infrastructure; ➤ No turbines or related infrastructure will be constructed near or on any designated sites such as NHAs, SACs or SPAs; ➤ A minimal volume of peat and subsoil will be removed to allow for infrastructural work to take place in comparison to the total volume present on the Site due to optimisation of the layout by mitigation by design; and, ➤ The majority of peat excavated during road construction will be permanently stored in the on-site borrow pit and at dedicated peat/spoil storage areas. A smaller proportion of excavated peat will be cast aside and landscaped at locations carefully selected by the project geotechnical expert and project hydrologist. 		
MM77	Leakages and Spillages	EIAR Chapter 4, 8 Appendix 4-4 Appendix 4-5	<ul style="list-style-type: none"> ➤ 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 with spill kits kept on site for accidental leakages or spillages; ➤ 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; ➤ Fuels stored on-site will be minimised. All 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 plant used during construction will be regularly inspected for leaks and fitness for purpose; and, ➤ An emergency response plan for the construction phase to deal with accidental spillages will be contained within the Construction Environmental Management Plan. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM78	Erosion of Exposed Subsoils and Peat	Chapter 8 Appendix 4-2	<ul style="list-style-type: none"> ➤ All excavated material will be completed in accordance with the Peat and Spoil Management Plan (FT. 2026 (a)), refer to Appendix 4-2). Material will be moved over the least possible distance. ➤ Any excess peat will be moved to peat storage areas or will be temporarily surrounded by earthen berms to prevent erosion. This will prevent erosion of soil. Silt fences will be installed around temporary stockpiles to limit movement of entrained sediment in surface water runoff. The use of earthen berms and silt fencing around earthworks and spoil mounds will prevent egress of water from the works. ➤ In order to minimize erosion of mineral subsoils stripping of peat will not take place during extremely wet periods⁶ (to prevent increased silt rich runoff). Temporary drainage systems (as outlined in Section 9.3.17 of the Chapter 9) will be required to limit runoff impacts during the construction phase. ➤ During tree felling brush mats will be used to support vehicles on soft ground, reducing peat and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brush mat renewal will take place when they become heavily used and worn. Provision will be made for brush mats along all off-road routes, to protect the soil from compaction and rutting. These best practice measures related to water quality protection are incorporated into the forestry management and mitigation measures as presented in Section 9.5.2.1 of Chapter 9.) 		
MM79	Peat Instability and Failure	Chapter 8	The following measures incorporated into the construction phase of the Proposed Project will assist in the management of the risks for this Site;		

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- ⁶ >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.

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		Appendix 8-1	<ul style="list-style-type: none"> ➤ Appointment of experienced and competent contractors; ➤ The site will be supervised by experienced and qualified personnel; ➤ Allocate sufficient time for the project (be aware that decreasing the construction time has the potential to increase the risk of initiating a peat movement); ➤ Prevent undercutting of slopes and unsupported excavations; ➤ Maintain a managed robust drainage system; ➤ Prevent placement of loads/overburden on marginal ground; ➤ Set up, maintain and report findings from monitoring systems; ➤ Ensure construction method statements are followed or where agreed modified/ developed; and, ➤ Revise and amend the Geotechnical Risk Register as construction progresses. 		
MM80	Biodiversity Management and Enhancement Plan	EIAR Chapter 8	<p>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.</p> <p>Given the nature of the restoration measures the following mitigation measures are proposed:</p> <ul style="list-style-type: none"> ➤ Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water runoff; ➤ Proposed off-road routes will be walked in advance of any machinery; ➤ All machinery operators will be experienced; ➤ The Proposed Wind Farm Site will be walked before a machine goes off-road; ➤ Bog mats will be used where the excavator is required to travel over wet ground; and, 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> > 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					
MM81	Site Road Maintenance	EIAR Chapter 8	<ul style="list-style-type: none"> > Use of aggregate from authorised quarries for use in road and hardstand maintenance. 		
MM82	Site Vehicle/Plant Use	EIAR Chapter 4, 8 Appendix 4-5	<ul style="list-style-type: none"> > Vehicles used during the operational phase will be refuelled off site before entering the Proposed Project site; > It is not envisioned that 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 Construction and Environmental Management Plan (CEMP) (see Appendix 4-5). 		
MM83	Use of Oil in Transformers	EIAR Chapter 4, 8 Appendix 4-5	<ul style="list-style-type: none"> > All transformers and substation areas will be bunded to 110% of the volume of oil used in each transformer/substation; > An emergency plan for the operational phase to deal with accidental spillages will be contained in the Construction and Environmental Management Plan (CEMP, refer to Appendix 4-5) for the wind farm operational phase. 		
EIAR Chapter 9 Hydrology and Hydrogeology					
Pre-Construction Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM85	Clear Felling of Coniferous Plantation	EIAR Chapter 4, 9 Appendix 4-5 Appendix 4-7	<p>All felling operations will conform to current best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and DAFM guidance documents, including the specific guidelines listed below, to ensure that felling, planting and other forestry operations result in minimal potential negative effects to the receiving environment.</p> <ul style="list-style-type: none"> ➤ Forestry Standards Manual (Forest Service, 2015); ➤ Forest Protection Guidelines (Forest Service, 2002); ➤ Forest Operations and Water Protection Guidelines (Coillte, 2013); ➤ Forestry and Water Quality Guidelines (Forest Service, 2000b); ➤ Coillte Planting Guideline SOP; ➤ A Guide to Forest Tree Species Selection and Silviculture in Ireland (Horgan et al., 2003); ➤ Management Guidelines for Ireland’s Native Woodlands. Jointly published by the National Parks & Wildlife Service (Cross and Collins, 2017); ➤ Native Woodland Scheme Framework (Forest Service, 2018); and, ➤ Code of Best Forest Practice (Forest Service, 2000) <p>Mitigation by Avoidance:</p> <p>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 “<i>Forestry and Water Quality Guidelines</i>” are shown in Chapter 9 Table 9-15.</p> <p>During the wind turbine construction phase a self-imposed buffer zone of 50 metres will be maintained for all streams where possible. These buffer zones are shown on Figure 9-8. With the exception of proposed new roads, proposed upgrades to existing roads and proposed watercourse crossings all proposed tree felling areas are located outside of imposed buffer</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>zones. Additional mitigation (detailed below) will be carried where tree felling is required inside the buffer zones.</p> <p>The large distance between most of the proposed felling areas and sensitive aquatic zones means that potential poor quality (sediment laden) runoff from felling areas will be adequately managed and attenuated prior to even reaching the aquatic buffer zone and primary drainage routes. Where tree felling is required within the 50m buffer, the following additional mitigation measures will be employed.</p> <p>Mitigation by Design:</p> <p>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:</p> <ul style="list-style-type: none"> ➤ Machine combinations (i.e., handheld or mechanical) will be chosen which are most suitable for ground conditions and which will minimise soils disturbance; ➤ 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; ➤ Ditches which drain from the proposed area to be felled towards existing surface watercourses will be blocked, and temporary silt traps will be constructed. No direct discharge of such ditches to watercourses will occur. Drains and sediment traps will be installed during ground preparation. Collector drains will be excavated at an acute angle to the contour (~0.3%-3% gradient), to minimise flow velocities. Main drains to take the discharge from collector drains will include water drops and rock armour, as required, where 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>there are steep gradients, and will avoid being placed at right angles to the contour;</p> <ul style="list-style-type: none"> ➤ Sediment traps will be sited in drains downstream of felling areas. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of in the peat disposal areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground; ➤ In areas particularly sensitive to erosion or where felling inside the 50 metre buffer is required, it will be necessary to install double or triple sediment traps; ➤ All drainage channels will taper out before entering the 50m buffer zone. This ensures that discharged water gently fans out over the buffer zone before entering the aquatic zone, with sediment filtered out from the flow by ground vegetation within the zone. On erodible soils, silt traps will be installed at the end of the drainage channels, to the outside of the buffer zone; ➤ 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. Correct drain alignment, spacing and depth will ensure that erosion and sediment build-up are minimized and controlled; ➤ Brash mats will be used to support vehicles on soft ground, reducing peat and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash 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. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall; ➤ Timber will be stacked in dry areas, and outside a local 50 metre watercourse buffer. Straw bales and check dams to be emplaced on the down gradient side of timber storage/processing sites; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water run-off; ➤ Checking and maintenance of roads and culverts will be on-going through the felling operation; ➤ Refuelling or maintenance of machinery will not occur within 100m of a watercourse. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; ➤ A permit to refuel system will be adopted; ➤ 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; ➤ Crossing of streams will not be permitted; ➤ Trees will be cut manually from along streams and using machinery to extract whole tree; and, ➤ Travel only perpendicular to and away from stream. <p>Silt Traps:</p> <p>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.</p> <p>Drain Inspection and Maintenance:</p> <p>The following items shall be carried out during pre-felling inspections and after:</p> <ul style="list-style-type: none"> ➤ 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; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ Inspection of main drainage ditches and outfalls. During pre-felling inspections the main drainage ditches shall be identified. 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. <p>Surface Water Quality Monitoring:</p> <p>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).</p> <p>Details of the proposed surface water quality monitoring programme are outlined in the Surface Water Management Plan (refer to Appendix 4-7).</p> <p>Criteria for the selection of water sampling points include the following:</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ 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; ➤ It is advantageous if the upstream location is outside/above the forest in order to evaluate the impact of land-uses other than forestry; ➤ Where possible, 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. <p>Also, daily surface water monitoring forms will also be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection.</p>		
Construction Phase					
MM86	Earthworks Resulting in Suspended Solids Entrainment in Surface Waters	EIAR Chapter 4, 9 Appendix 4-3 Appendix 4-4	<p>Mitigation by Avoidance:</p> <p>The key mitigation measure during the construction phase is the avoidance of sensitive aquatic areas where possible. From Figure 9-8 it can be seen that all of the key areas of the Proposed Project are actually significantly away from the delineated buffer zones with the exception of sections of proposed upgrades to existing roads, proposed new roads, proposed stream crossings and existing stream crossings requiring upgrading. Additional control measures, which are outlined further on in this section, will be undertaken at these locations.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		Appendix 4-5	<p>The large setback distance from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures (discussed below) to be properly installed and operated effectively. The proposed buffer zone will:</p> <ul style="list-style-type: none"> ➤ Avoid physical damage to watercourses, and associated release of sediment; ➤ Avoid excavations within close proximity to surface water courses; ➤ 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. <p>Mitigation by Design:</p> <ul style="list-style-type: none"> ➤ Source controls: <ul style="list-style-type: none"> ○ 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 or other similar/equivalent or appropriate measures. ➤ In-Line controls: <ul style="list-style-type: none"> ○ 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/attenuation lagoons, sediment traps, pumping systems, settlement ponds, temporary 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>pumping chambers, or other similar/equivalent or appropriate systems.</p> <ul style="list-style-type: none"> ➤ Treatment systems: <ul style="list-style-type: none"> ○ Temporary sumps and attenuation ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems. <p>The main elements of interaction with existing drains will be as follows:</p> <ul style="list-style-type: none"> ➤ 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 Project 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 stilling 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, straw bales, flow limiters, weirs, baffles, silt fences will be used during the upgrade 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>construction works. Regular buffered outfalls will also be added to these drains to protect downstream surface waters.</p> <p>Pre-commencement Temporary Drainage Works</p> <p>Prior to the commencement of road upgrades (or new road/hardstand or turbine base installs) the following key temporary drainage measures will be installed:</p> <ul style="list-style-type: none"> ➤ 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 roadside drains; and, ➤ A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone. <p>Refer to the drainage plan (Appendix 4-3) for the location of these temporary measures.</p> <p>Water Treatment Train:</p> <p>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.</p> <p>Silt Fences:</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids. This will act to prevent entry to water courses 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 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 drains down-gradient of all construction areas inside the hydrological buffer zones.</p> <p>Silt Bags:</p> <p>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.</p> <p>Settlement Ponds:</p> <p>The Proposed Wind Farm Site infrastructure footprint has been divided into drainage catchments (based on topography, outfall locations, and catchment size) and stormwater runoff rates based on the 10-year return period rainfall event were calculated for various catchment areas in order to size the settlement ponds.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>The location and dimensions of proposed settlement ponds are shown on the Proposed Wind Farm Site drainage plan drawings (Appendix 4-3).</p> <p>Level Spreaders and Vegetation Filters:</p> <p>Level spreaders and vegetation filters will be implemented at the settlement ponds. 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 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.</p> <p>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 Proposed Wind Farm Site drainage prior to reaching the downstream watercourses.</p> <p>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).</p> <p>Pre-emptive Site Drainage Management</p> <p>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 peat/subsoil or vegetation stripping will be suspended or scaled back if heavy</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.</p> <p>The following forecasting systems are available and will be used on a daily basis at the site to direct proposed construction activities:</p> <ul style="list-style-type: none"> ➤ 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. <p>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.</p> <p>Works will be suspended if forecasting suggests either of the following is likely to occur:</p> <ul style="list-style-type: none"> ➤ >10 mm/hr (i.e., high intensity local rainfall events); 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, ➤ >half monthly average rainfall in any 7 days. <p>Prior to works being suspended the following control measures will be completed:</p> <ul style="list-style-type: none"> ➤ Secure all open excavations; ➤ Provide temporary or emergency drainage to prevent back-up of surface runoff; and, ➤ Avoid working during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded. <p>Management of Runoff from Peat and Subsoil Management Areas:</p> <p>During the initial construction of management areas, silt fences, straw bales and biodegradable geogrids will be used to control surface water runoff from works areas.</p> <p>Where applicable, the vegetative top-soil layer of the peat and spoil management areas will be rolled back to facilitate placement of excavated spoil, following which the vegetative-top soils layer will be reinstated. Where reinstatement is not possible, spoil and peat management areas will be sealed with a digger bucket and seeded as soon possible to reduce sediment entrainment in runoff.</p> <p>Drainage from peat and spoil storage areas will ultimately be routed to an oversized swale and a number of stilling ponds pond with appropriate storage and settlement designed for a 1 in 10-year return period before being discharged to the on-site drains.</p> <p>Peat/subsoil reinstatement areas will be sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in runoff. Once re-vegetated and stabilised peat/subsoil reinstatement areas will no longer be a potential source of silt laden runoff.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>Therefore, at each stage of the peat and spoil management area development the above mitigation measures will be deployed to ensure protection of downstream water quality.</p> <p>Timing of Site Construction Works:</p> <p>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.</p> <p>Monitoring:</p> <p>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.</p> <p>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.</p> <p>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 is included in Appendix 4-5 of this EIAR).</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM87	Excavation Dewatering and Potential Impacts on Surface Water Quality	EIAR Chapter 9	<p>Management of groundwater seepages and subsequent treatment prior to discharge into the drainage network will be undertaken as follows:</p> <ul style="list-style-type: none"> ➤ 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; ➤ 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 a suitably qualified person 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. 		
MM88	Leakages or Spillages of Hydrocarbons	Chapter 9	Mitigation measures proposed to avoid release of hydrocarbons at the site are as follows:		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ 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 fuel truck with spill kits kept on site for accidental leakages or spillages; ➤ 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; ➤ Fuels stored on-site will be minimised. All 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 transformer within the proposed substation extension 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; and, ➤ An emergency response plan for the construction phase to deal with accidental spillages will be contained within the Construction Environmental Management Plan (which is contained in Appendix 4-5). 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM89	Release of Cement-Based Products	EIAR Chapter 4, 9 Appendix 4-4	<ul style="list-style-type: none"> ➤ 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 cement 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. 		
MM90	Wastewater Disposal	EIAR Chapter 9	<ul style="list-style-type: none"> ➤ It is proposed to manage wastewater from the staff welfare facilities in the control buildings by means of a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants. It is not proposed to treat wastewater on-site. 		
MM91	Morphological Changes to Surface Water Course & Drainage Patterns	EIAR Chapter 9	<ul style="list-style-type: none"> ➤ Watercourse crossings will be bottomless or clear span structures and the existing banks will remain undisturbed. No in-stream excavation works are proposed and therefore there will be no direct impact on the stream at the proposed crossing location; ➤ Where the proposed cable route follows an existing road or road proposed for upgrade, the cable will pass over or below the culvert within the access road; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ All guidance / mitigation measures proposed by the OPW or the Inland Fisheries Ireland⁷ is incorporated into the design of the proposed crossings; ➤ As a further precaution, near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document “Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites”, i.e., May to September inclusive. This time period coincides with the period of lowest expected 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 (any deviation from this will be done in discussion with the IFI); ➤ During the near stream construction work double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed in the vicinity of the crossing construction areas; ➤ All new river/stream crossings will require a Section 50 application (Arterial Drainage Act, 1945). The river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent; and, ➤ All crossings will be designed to accommodate a 100-year design flood with allowance for 300mm freeboard <p>The watercourse crossings will be constructed to the specifications of the OPW bridge design guidelines ‘Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945’, and in consultation with Inland Fisheries Ireland. Abutments will be constructed from precast units combined with in-situ foundations, placed within an acceptable backfill material.</p>		

⁷ Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>Confirmatory inspections of the proposed new watercourse crossing location will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.</p> <p>In relation to the new proposed culverts and proposed culvert upgrades at forestry drain crossings, the culverts will be suitably sized (approx. 900mm) 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 water crossings will simply consist of an appropriately sized pipe buried in the sub-base of the road 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.</p>		
MM92	Hydrologically Connected Designated Sites	EIAR Chapter 9	<p>Drainage mitigation measures for surface water quality protection during the construction phase are summarised again below: (Please refer to MM85 and MM86 above for the full description of these measures and how they will be applied).</p> <ul style="list-style-type: none"> ➤ The proposed mitigation measures will include 50m buffer zones for avoidance of sensitive hydrological features (streams and rivers); ➤ Pre-construction drainage control measures (Section 9.5.2.2); ➤ Robust drainage control measures (i.e. interceptor drains, swales, settlement ponds and treatment trains such as Siltbuster) will ensure that the quality of runoff from Proposed Project areas will be very high; and, ➤ Best practice measures with regard use of oils, fuels (MM87) and cement based compounds (MM88). 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM93	WFD Status	EIAR Chapter 9	Comprehensive surface water mitigation and drainage controls are outlined in MM84 (Felling of Coniferous Plantations), MM85 (Earthworks), MM86 (Excavation Dewatering), Section MM87 (Hydrocarbons), MM88 (Cement-based Products) and MM90 (Morphological Changes to Watercourses). These will ensure the protection of surface water quality and flows in all downstream receiving watercourses.		
MM94	Use of Siltbuster	EIAR Chapter 9	<p>Measures employed to prevent overdosing and potential chemical carryover:</p> <ul style="list-style-type: none"> ➤ 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 will be carried out, which 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 will be used at very sensitive sites (i.e. upstream of SACs). 		
MM95	Earthworks Works and Watercourse Crossings	EIAR Chapter 9	<p>Pre-commencement Temporary Drainage Works:</p> <p>Prior to the commencement of the cable trenching or crossing works the following key temporary drainage measures will be installed:</p> <ul style="list-style-type: none"> ➤ All existing roadside drains (where present) that intercept the proposed works area will be temporarily blocked down-gradient of the works using check dams/silt traps; 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ Culverts, manholes and other drainage inlets (where present) will also be temporarily blocked; and, ➤ A double silt fence perimeter will be placed along the road verge on the down-slope side of works areas that are located inside a watercourse 50m buffer zone. <p>The following mitigation measures will be implemented for the proposed 33kV underground cabling watercourse crossing works:</p> <ul style="list-style-type: none"> ➤ No stock-piling of construction materials will take place along the grid route; ➤ No refuelling of machinery or overnight parking of machinery is permitted within 100m of a watercourse crossing; ➤ No concrete truck chute cleaning is permitted along the Proposed Grid Connection Site underground cabling route; ➤ Works will not take place at periods of high rainfall, and will be scaled back or suspended if heavy rain is forecast; ➤ Local road drainage, culverts and manholes will be temporarily blocked during the works; ➤ Machinery deliveries will be arranged using existing structures along the public road; ➤ All machinery operations will take place away from the stream and ditch banks, apart from where crossings occur. Although no instream works are proposed or will occur; ➤ Any excess construction material will be immediately removed from the area and sent to a licenced waste facility; ➤ Spill kits will be available in each item of plant required to complete the stream crossing; and, ➤ Silt fencing will be erected on ground sloping towards watercourses at the stream crossings if required. <p>Fracture Blow-out (Frac-out) Prevention and Contingency Plan for HDD:</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e. Clear Bore Drilling Fluid or similar will be used); ➤ The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage; ➤ One or more lines of silt fencing will be placed between the works area and the adjacent river; ➤ Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility; ➤ Adequately sized skips will be used where temporary storage of arisings are required; ➤ The drilling process / pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse; ➤ This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur, then drilling will be immediately stopped; ➤ Any frac-out material will be contained and removed off-site; ➤ The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and, ➤ If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location. 		
MM96	Biodiversity Management and Enhancement Plan	EIAR Chapter 9	<p>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. Refer also to Section 9.5.2.1 above for tree felling mitigation.</p> <p>Given the nature of the restoration measures the following mitigation measures are proposed:</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water runoff; ➤ Proposed off-road routes will be walked in advance of any machinery; ➤ All machinery operators will be experienced; ➤ The proposed areas will be walked before a machine goes off-road; ➤ Bog mats will be used where the excavator is required to travel over wet ground; ➤ A low ground pressure excavator with wide tracks (1.9m or greater) will be used to reduce compaction of the peat and subsoils.; and, ➤ Standard tree felling water quality protection mitigation as presented in MM84 above will be employed. 		
MM97	Doo Lough Public Water Supply (PWS)	EIAR Chapter 9	<p>As stated previously in the chapter, a comprehensive surface water management plan has been prepared for the Proposed Project, and this will ensure that surface water runoff from the developed areas of the Site will be of a high quality and will therefore not impact on the quality of downstream rivers and lakes. Refer to MM95 above for proposed mitigation measures at the Proposed Enhancement Site.</p> <p>During the layout optimisation process, all surface waters at the site were classified as very sensitive. Very sensitive surface waters are receptors of high environmental importance such as designated sites (i.e. NHA or SAC), or public drinking water supplies. The surface waters at the Proposed Project were applied the highest possible sensitivity rating and appropriate mitigation measures which include avoidance and best practice engineering design measures are proposed to avoid significant impacts.</p>		
Operational Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM98	Removal of Vegetation Cover Progressive Replacement of Natural Surfaces with Lower Permeability Surfaces	EIAR Chapter 4, 9 Appendix 4-4	<p>The operational phase drainage system of the Proposed Project will be installed and constructed in conjunction with the road and hardstanding construction work as described below and as shown on the Drainage drawings submitted with this planning application:</p> <ul style="list-style-type: none"> ➤ Interceptor drains will be maintained 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 will be re-distributed over the ground by means of a level spreader; ➤ Swales/road side drains will be used to collect runoff from access roads 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 road transverse drains ('grips') will be constructed in the surface layer of the road to divert any runoff off the road into swales/road side drains; ➤ Check dams will be used along sections of access road drains to intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock; ➤ Settlement ponds, emplaced downstream of road 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 will be designed in consideration of the greenfield runoff rate. 		
MM99	Runoff	EIAR Chapter 9	The mitigation measures outlined in Sections 9.5.2.2 and 9.5.3.1 will ensure all surface water runoff from upgraded roads and new road surfaces (including hardstand and turbine base areas) will be captured and treated prior to discharge/release. Settlement ponds, checks dams and		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			buffered outfalls will prevent roads acting as preferential flowpaths by providing attenuation and water quality treatment (refer to Appendix 4-3).		
EIAR Chapter 10 Air Quality					
Construction Phase					
MM101	Exhaust Emissions: Construction of the Proposed Project Infrastructure	EIAR Chapter 10	<ul style="list-style-type: none"> ➤ 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 will produce and follow a site inspection and machinery checklist which will be followed and updated as required. ➤ All plant and materials vehicles 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. ➤ All plant and materials vehicles will be stored in dedicated areas (onsite). ➤ 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. ➤ The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Site. Therefore, all wastes streams generated onsite will be deposited into a single waste skip which will be covered. This 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 Site to reduce the emissions associated with vehicle movements. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ Aggregate materials 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). 		
MM102	Exhaust Emissions: Transportation to and from the Site	EIAR Chapter 10: Air Quality	<ul style="list-style-type: none"> ➤ 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 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). 		
MM103	Dust Emissions: Construction of Proposed Project	EIAR Chapter 10: Air Quality	<ul style="list-style-type: none"> ➤ Groundworks (i.e. works with potential to create dust) associated with the Proposed Project will be fully supervised by an Ecological Clerk of Works (ECoW). ➤ The ECoW will regularly monitor adjacent marsh fritillary habitat on a daily basis for potential signs of dust deposition or any other habitat degradation. Dust level thresholds and weather will also be monitored. ➤ 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ The ECoW will have power to halt construction works if required as outlined above. ➤ 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 Proposed Wind Farm Site on specified haul routes only. ➤ The agreed haul route road adjacent to the Proposed Wind Farm Site will be regularly inspected for cleanliness and cleaned as necessary. ➤ The roads adjacent to the Proposed Wind Farm Site proposed new entrance will be checked weekly for damage/potholes and repaired as necessary. ➤ The transportation of construction materials from locally sourced quarries for the Proposed Grid Connection Site infrastructure and for the Proposed Wind Farm 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 Proposed Wind Farm 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM104	Dust Emissions: Transport to and from the Site	EIAR Chapter 10: Air Quality	<ul style="list-style-type: none"> ➤ 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. ➤ Turbine components and construction materials will be transported to the Proposed Wind Farm Site on specified haul routes only, as agreed with the local authority. ➤ Construction materials for the Proposed Project will be sourced locally from the onsite borrow pit. ➤ 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. ➤ The transport of construction materials around the onsite borrow pit will be covered by tarpaulin where necessary. ➤ 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 Site to reduce the amount of emissions associated with vehicle movements <p>➤ A CEMP will be in place throughout the construction phase (see Appendix 4-5).</p>		
Operational Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM105	Exhaust Emissions	EIAR Chapter 10	<ul style="list-style-type: none"> ➤ 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. ➤ 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 Site to reduce the emissions associated with vehicle movements. 		
Decommissioning Phase					
MM106	Air Quality	EIAR Chapter 10: Air Quality	Any impact and consequential effect that occurs during the decommissioning phase are similar to that which occur during the construction phase, albeit of lesser impact. The mitigation measures prescribed for the construction phase of the Proposed Project will be implemented during the decommissioning phase thereby minimising any potential impacts.		
EIAR Chapter 11 Climate					
Construction Phase					
MM107	Greenhouse Gas Emissions	EIAR Chapter 11	<ul style="list-style-type: none"> ➤ 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 construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ 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. Please see Chapter 15: Material Assets for details. ➤ It is intended to obtain the majority of materials for the construction of the Proposed Project from the proposed onsite borrow pits, with some material being imported from local licenced quarries as needed. This will significantly reduce the number of delivery vehicles accessing the site, thereby reducing the emissions associated with vehicle movements. ➤ A CEMP (Appendix 4-4) will be in place throughout the construction phase. ➤ The CEMP includes a Resource Waste Management Plant (RWMP) which outlines the best practice procedures that will occur during the construction phase relating to waste material. <ul style="list-style-type: none"> ○ The RWMP 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 4.5.6 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 site to reduce the amount of emissions associated with vehicle movements. The closest MRF to the Proposed Project and is approximately 19.4km southeast of the Proposed Wind Farm. ➤ Where applicable, low-carbon intensive construction materials will be sourced and utilised onsite. 		
Operational Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM108	Greenhouse Gas Emissions	EIAR 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.		
EIAR Chapter 12 Noise					
Construction Phase					
MM110	Construction Phase Noise	EIAR Chapter 12	<p>Construction activities will be undertaken in accordance with best practice noise and vibration control measures set out in BS 5228-1 and BS 5228-2. The assessment has demonstrated that construction noise and vibration levels are expected to comply with relevant criteria, and therefore no specific mitigation is required.</p> <p>Nevertheless, a range of standard control measures will be implemented through the Construction and Environmental Management Plan to minimise potential impacts, including restricting working hours, selecting low-noise plant, appropriate siting of equipment, monitoring at sensitive receptors, and maintaining communication with local authorities and residents.</p> <p>Additional targeted measures will be applied where necessary for specific activities such as tree felling, rock breaking or blasting, including plant orientation, use of temporary noise screens, equipment damping, charge control, restricted blasting hours, monitoring, and a formal complaints procedure.</p>		
MM111	Construction Phase Vibration	EIAR Chapter 12	<p>The assessment has demonstrated that no significant vibration impacts are expected during construction and that compliance will be achieved with the recommended vibration limits.</p> <p>Where blasting is required, a specialist blast design engineer will undertake a detailed assessment and define appropriate design parameters, with all recommended mitigation measures implemented to ensure vibration levels remain within the specified criteria.</p>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Operational Phase					
MM112	Operational Wind Turbine Noise	EIAR Chapter 12	<p>In the event of a complaint indicating potential excessive amplitude modulation or tonality associated with the Proposed Project, the Developer will fully investigate the complaint in collaboration with the turbine manufacturer, through review of the meteorological periods and conditions during which the reported AM or tonality occurs. A noise monitoring protocol would be established, in consultation with the relevant local authorities, which would set out the location and analysis methodology to be employed for the noise monitoring.</p> <p>The measurement method outlined in the IOA AMWG document, known as the 'Reference Method', provide a robust and reliable indicator of AM and yield important objective information on the frequency and duration of occurrence, which can be used to evaluate different operational conditions including methods, determined in liaison with the turbine manufacturer, to minimise the occurrence of excessive AM. These mitigation measures, if required, will consist of either turbine blade modifications or the implementation of operational controls for the relevant turbine type, which will include operating turbines in different operational modes or turbine curtailment under specific operational conditions and may in very unlikely circumstance require turning specific turbines off under certain conditions.</p>		
MM113	Operational Fixed Plant Noise (Substation)	EIAR Chapter 12	Operational noise from the fixed plant at the proposed extension to the Slievecallan 110 kV substation is predicted to comply with the applicable noise criteria and no specific mitigation is required. Nevertheless, at the detailed design stage, measures will be incorporated to minimise potential noise impacts at nearby sensitive locations, including appropriate selection, siting and maintenance of plant, ensuring replacement plant complies with noise limits, and preventing tonal or impulsive noise characteristics, particularly during night-time periods.		
EIAR Chapter 13 Landscape and Visual					
Construction Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM115	Visual Effects	EIAR Chapter 13	In all circumstances, excavation depths and volumes will be minimised, and excavated material will be re-used where possible.		
Operational Phase					
MM116	Landscape Effects	EIAR Chapter 13	<p>Strategic Siting</p> <ul style="list-style-type: none"> ➤ The Proposed Wind Farm Site is primarily sited within the Slieve Callan Uplands Landscape Character Area (LCA), an LCA of the lowest landscape sensitivity rating for wind energy development in County Clare, as set out in local planning policy. The landscape characteristics of this LCA make it highly suitable and capable of absorbing multiple large scale wind energy developments. ➤ The Proposed Project is not located within any high sensitivity landscape designations of County Clare ('Heritage' Landscapes'). ➤ The Proposed Wind Farm Site is primarily comprised of a marginal upland landscape strongly influenced by land uses such as commercial forestry and historical peat extraction. As such, it is a modified working landscape with low sensitivity, deemed capable of absorbing the Proposed Turbines. ➤ The Proposed Turbines are sited in an upland landscape of large scale, capable of effectively accommodating multiple wind energy developments. <p>Design Considerations</p> <ul style="list-style-type: none"> ➤ The spatial configuration of the proposed infrastructure footprint has been carefully designed to minimise the loss of valuable landscape receptors on the Site, such as peatland of high biodiversity value. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ The proposed internal site road layout maximises the use of the existing forestry tracks wherever possible, to minimise the requirement for new tracks within the Site. ➤ In all circumstances, excavation depths and volumes will be minimised, and excavated material will be re-used where possible. ➤ To minimise cut and fill activities required to construct the Proposed Project, the proposed access roads, and other infrastructure such as hardstands have been designed to align with the existing terrain within the landscape of the Site. ➤ During initial vegetation stripping, all useful topsoil material will be temporarily stored on the Proposed Wind Farm 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 pits. 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. 		
MM117	Visual Effects	EIAR Chapter 13	<p>Mitigation By Design</p> <ul style="list-style-type: none"> ➤ The turbine layout has been designed to create a coherent arrangement of turbines, contiguous and connected to each other visually and with consistent spacing in line with the guidance for design and siting of wind farms in 'Mountain Moorland' Landscape Types in the Guidelines (DoEHLG, 2006), and regard to the Draft Guidelines (DoHPLG, 2019). ➤ Siting of Proposed Turbines adheres to the minimum 500m set back distance in the current Guidelines (DoEHLG, 2006) and also the recommended larger 4 times tip height set back distance to third party properties, explicitly set out for residential visual amenity, prescribed by the Draft Guidelines (DoHPLG, 2019); 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ The Proposed Turbines are sited in a sparsely populated area with appropriate setback distances from local population centres. ➤ The topographical characteristics of the marginal upland landscape and its surrounding area naturally limit the visual exposure of the Proposed Turbines. Distinctive ridgelines and landforms of the upland landscape to the east and north effectively obscure visibility of the turbines from much of the broader landscape, thereby limiting the extent of landscape and visual impact upon large numbers of receptors as shown by the ZTV map ➤ The Proposed Wind Farm Site is located nearby (approx. 3.6km) to the existing Slievecallan substation and grid infrastructure where the grid connection occurs, this proximity significantly reduces the extent of grid infrastructure required to facilitate renewable energy generation and therefore minimises landscape and visual impacts that could potentially arise from this component of the Proposed Project. ➤ The proposed 33kV cabling is underground and follows the local road network and existing forestry tracks. ➤ The proposed extension to the existing 110kV Slievecallan substation is sited at a location surrounded by coniferous plantations, thereby eliminating limiting potential landscape and visual effects during the operational phase. 		
EIAR Chapter 14 Cultural Heritage					
Construction Phase					
MM118	Recorded Monuments (Direct Effects)	EIAR Chapter 14	<ul style="list-style-type: none"> ➤ A 30m exclusion zone will be established around Stone Circle CL031-052— prior to the commencement of the construction phase of the project. The exclusion zone will be established under the supervision of the appointed archaeologist and be delimited by durable fence posts and fencing with ‘Keep Out’ signage. A photographic record of the exclusion zone will be made by the appointed archaeologist and included in the 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>subsequent reporting for the Site. The requirement for the exclusion zone, fencing materials and signage will be included in the CEMP.</p> <ul style="list-style-type: none"> ➤ The location of recorded monuments CL031-018— Ringfort and CL031-019— Earthwork should be clearly shown in the CEMP. No tracking of machinery or other activities associated with the conifer felling will take place in the area of the recorded monuments. <p>The location of any potential Cultural Heritage features therein will be recorded and a photographic record made of same. A report on the results of the walk-over survey will be compiled on completion of same and will include any further required mitigation measures such as additional buffer zones, etc, deemed necessary.</p>		
MM119	Previously Unrecorded Monuments within the Site	EIAR Chapter 14	<p>The Proposed Enhancement Site includes areas proposed for clear-felling which are currently densely forested. Such forestry cover may obscure the presence of previously unknown Cultural Heritage assets, although none are indicated on the available historic mapping. In this regard and in the interest of ensuring the continued preservation of any items of Cultural Heritage merit which may be located within the Proposed Enhancement Site some mitigation is proposed as a precautionary measure.</p> <ul style="list-style-type: none"> ➤ A walk-over survey of the Proposed Enhancement Site will be carried out post-clear-felling but prior to any other works such as stump flipping or drain blocking. ➤ The location of any potential Cultural Heritage features therein will be recorded and a photographic record made of same. A report on the results of the walk-over survey will be compiled on completion of same and will include any further required mitigation measures such as additional buffer zones, etc, deemed necessary. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM120	Sub-Surface Archaeological Potential	EIAR Chapter 14	<p>Archaeological monitoring of ground works (including pre-commencement site investigation works) in areas of previously undisturbed ground. If archaeological finds, features or deposits are uncovered during archaeological monitoring, the developer will be prepared to provide resources for the resolution of such features whether by preservation by record (excavation) or preservation in situ (avoidance). The National Monuments Service will be informed of such findings to discuss how best to proceed. On completion of the work, a report on the results of the monitoring will be compiled and submitted to the NMS and the Local Authority.</p> <ul style="list-style-type: none"> ➤ Archaeological monitoring under licence from the NMS of any geotechnical / engineering trial pits or investigations will be carried out by a suitably qualified archaeologist. A report detailing the results of the monitoring will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body. ➤ Pre-development testing, under licence from the NMS, will be carried out in areas where peat depths allow a meaningful investigation. Testing will only be undertaken in areas where ground disturbance will take place as part of the Proposed Project. Where peat depths become a limitation to testing, monitoring at the construction stage will be undertaken. The areas to be tested will be chosen by the appointed archaeologist and the number of test trenches agreed between the archaeologist and the NMS through the licensing system. A report on the testing will be compiled on completion of the work. Should archaeological finds, structures or deposits be uncovered as a result of the testing 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. ➤ 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 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>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.</p> <ul style="list-style-type: none"> ➤ A walk-over survey of the Proposed Enhancement Site will be carried out post-clear-felling but prior to any other works such as stump flipping or drain blocking. ➤ The location of any potential Cultural Heritage features therein will be recorded and a photographic record made of same. A report on the results of the walk-over survey will be compiled on completion of same and will include any further required mitigation measures such as buffer zones, etc, deemed necessary. ➤ A second phase of walk-over survey will be carried out after stump flipping to ensure that any potential finds, features or deposits, if present, can be recorded and any other mitigation required can be implemented where necessary. 		
MM121	Items of Local Cultural Heritage Merit	Chapter 14	<p>A 10m exclusion zone will be established around CH1 stone structure prior to the commencement of the construction phase of the project. The exclusion zone will be established under the supervision of the appointed archaeologist and be delimited by durable fence posts and fencing with 'Keep Out' signage. A photographic record of the exclusion zone will be made by the appointed archaeologist and included in the subsequent reporting for the Site. The requirement for the exclusion zone, fencing materials and signage will be included in the CEMP.</p>		
ElAR Chapter 15 Material Assets					
Material Assets - Traffic					
Construction Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
M122	Mitigation by Design	Chapter 15 Section 15.1	<p>Mitigation by design measures include the following:</p> <ul style="list-style-type: none"> ➤ Selection of the most appropriate delivery route to transport the wind turbine components, requiring the minimum remedial works to accommodate the vehicles as set out in Section 15.1.2.2. ➤ Selection of the shortest Proposed Grid Connection Site diversion routes, minimising the impacts on the existing road network and traffic. ➤ Use of on-site borrow pit to produce materials to minimise deliveries to site during construction. 		
MM123	Delivery of Abnormal Loads	Chapter 15	<p>The following are the main points to note for these deliveries which will take place after peak evening traffic:</p> <ul style="list-style-type: none"> ➤ 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 72 abnormal sized loads will be delivered to the Site, comprising 24 convoys of 3 vehicles, undertaken over 24 separate nights. ➤ These nights will be spread out over an approximate period of 5 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM124	Other Traffic Management Measures	EIAR Chapter 15 Section 15.1 Appendix 15-2	<p>A detailed Traffic Management Plan (TMP) will be provided specifying details relating to traffic management and included in the CEMP prior to the commencement of the construction phase of the Proposed Project. The 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:</p> <ul style="list-style-type: none"> ➤ 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 Clare 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 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 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<p>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.</p> <ul style="list-style-type: none"> ➤ Diversion routes during underground cabling construction – The identification and agreement with suitable diversion routes during the construction of the proposed 33kV underground cabling. ➤ Liaison with the relevant local authority - Liaison with Clare 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 Clare 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ 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. ➤ One-way delivery systems (concrete pour days) - HGVs leaving the site on the busiest construction days (i.e. the 9 days when the concrete foundations are poured) to return to their plant via a short detour. 		
Material Assets - Other					
Pre-Construction/Construction Phase					
MM126	Electricity	EIAR Chapter 4, 5, 15 Appendix 4-5	<ul style="list-style-type: none"> ➤ The construction of the proposed underground cable connection will be in phases along the Proposed Grid Connection Site, to minimise the duration of outage whilst making the connection to the proposed extension to the existing Slievecallan 110kV substation. ➤ Goal posts will be established under overhead lines for the entirety of the construction phase. They will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks <ul style="list-style-type: none"> ○ Prior to construction, the Applicant will engage with ESB via the 'Dial Before You Dig' procedure online. ESB will be contacted via dig@esb.ie before excavating near any overhead lines. ➤ The suitability of machinery and equipment for use near power lines will be risk assessed. ➤ 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. ➤ Prior to the delivery of turbines to the Proposed Wind Farm Site, a dry run of the route using vehicles with similar dimensions will occur. Please see Section 15.1.8 of Chapter 15: Material Assets for details. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ When activities must be carried out beneath overhead lines, e.g. component delivery or grid cable laying, 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 is undertaken 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 Section 5 of the CEMP and Chapter 5 Population and Human Health will be adhered to during the construction, operation and decommissioning phases. ➤ Any area where excavations are planned will be surveyed and all existing services will be identified prior to commencement of any works. ➤ 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 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 commencing construction. 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ The developer will also carry out further consultation in the pre-construction phase and construction phase with GNI to confirm the crossing methodology to be deployed and to ensure that no new service crossings have been implemented. Furthermore, site investigation will be undertaken post planning grant and results will be shared with GNI as part of the Design Review process prior to construction. ➤ 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. ➤ 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 specifications of the relevant utility provider. 		
MM127	Waste Management	EIAR Chapter 15 Section 15.2 Appendix 4-5	<ul style="list-style-type: none"> ➤ 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. 		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			<ul style="list-style-type: none"> ➤ 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 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. 		
Operational Phase					
MM128	Waste Management Services	EIAR Chapter 15	There will be no operational phase impacts or associated effects on waste management associated with the Proposed Project. It is not anticipated that any significant volume of waste will be generated within the Site during the operational phase of the Proposed Project as only a small number of operational and maintenance personnel will be present within the Proposed Wind Farm Site at certain times. Any waste generated due to the operation and maintenance of the Proposed Project will be disposed of in a covered skip, located within the existing onsite 110kV substation compound. The waste material will be transferred to a Materials Recovery		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Facility (MRF) by a fully licenced waste contractor where the waste will be sorted into individual waste stream for recycling, recovery or disposal.		
MM129	Telecommunications	EIAR Chapter 15	While no mitigation measures are required, a standard Protocol Document has been prepared by 2RN for the Proposed Project. It is standard practice of 2RN to produce a protocol document for wind farm developments, which will be signed by the developer prior to construction. The Protocol Document is further detailed in Section 15.2.4 of Chapter 15.		
MM130	Aviation	EIAR Chapter 15	<p>As no impacts were identified by 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:</p> <p><u>Irish Aviation Authority</u></p> <ol style="list-style-type: none"> 1. <i>Agree an aeronautical obstacle warning light scheme for the wind farm development</i> 2. <i>Provide as-constructed coordinates in WGS84 format together with ground and blade tip height elevations at each wind turbine location and</i> 3. <i>Notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection.</i> <p><u>Department of Defence</u></p> <p>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. 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. Light intensity to be of similar value to that emitted in the visible spectrum of light.</p>		



8. **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 BMEP prepared as part of the planning application to An Coimisiún Pleanála.

This section of the CEMP 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 8-1 Schedule of 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 Appendix 4-7	<p>Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement of felling and construction at the Site.</p> <p>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.</p> <p>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.</p>	As required	As Necessary	Project Hydrologist
MX2	Drainage Maintenance	EIAR Chapter 4, 9 Appendix 4-5 Appendix 4-7	<p>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.</p>	Ongoing	Monthly	Project Hydrologist

			The inspection of the drainage system will be the responsibility of the ECoW or the Project Hydrologist. Please see Chapter 9 and CEMP (Appendix 4-5) for further information.			
MX3	Traffic and Transport	Appendix 4-5 Appendix 15-2	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	ECoW
MX4	Invasive Species	EIAR Chapter 6 Appendix 4-5 Appendix 6-5	A pre-commencement invasive species survey of the construction footprint will be undertaken by a qualified ecologist to determine if any invasive species have established on the site since the undertaking of the previous surveys. Ongoing monitoring will be required, with suitable follow-up management in order to control new growth or re-establishment of this species within the infested areas.	Once	As required	Project Ecologist
MX5	Otter	EIAR Chapter 6	A pre-construction otter survey will be carried out by a qualified ecologist to identify the presence of any breeding sites within the Site, that may have been established since the undertaking of the previous surveys. Surveys will follow the following guidelines issued by Transport Infrastructure Ireland - Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Roads Schemes (TII, 2008).	Once	As required	Project Ecologist
MX6	Badger	EIAR Chapter 6	A pre-construction badger survey will be carried out by a qualified ecologist to identify the presence of any breeding sites within the Site,	Once	As required	Project Ecologist

			<p>that may have been established since the undertaking of the previous surveys.</p> <p>Surveys will follow the following guidelines issued by Transport Infrastructure Ireland - Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Roads Schemes (TII, 2008) and Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes (TII, 2005).</p>			
MX7	Marsh Fritillary	EIAR Chapter 6	<p>A pre-commencement survey for marsh fritillary larvae will be undertaken at the suitable time of year (i.e. August – September) in advance of construction commencing. This pre-commencement survey will cover the entirety of the Project Footprint.</p>	Once	As required	Project Ecologist
MX8	Red Squirrel/Pine Marten	EIAR Chapter 6	<p>A pre-construction survey for pine marten/red squirrel will be carried out to identify the presence of any new breeding sites. These surveys will focus on areas of Conifer plantation (WD4) to be felled and all suitable habitat within 50m of the felling blocks.</p> <p>Surveys will be undertaken by a suitably qualified ecologist and during the optimal season for each species, as per TII (2008) guidelines.</p>	Once	As required	Project Ecologist
MX9	Reptiles and Amphibians	EIAR Chapter 6	<p>Prior to construction of the Proposed Project, pre-commencement surveys for viviparous lizard, common frog, and smooth newt will be undertaken within potential supporting habitat identified within the Project Footprint. Surveys will be undertaken by a suitably qualified ecologist and during the optimal season for each species, as per TII (2008) guidelines.</p>	Once	As required	Project Ecologist

MX10	Birds	<p>ELAR Chapter 7</p> <p>Appendix 7-7</p>	<p>It is proposed that construction works will commence outside the bird nesting season (1st of March to 31st of August inclusive) to avoid the most sensitive time of the year for most bird species with the potential to use the site and its environs. Works are defined as the clearing of woody vegetation, any building or engineering works. Pre-commencement surveys will be undertaken within one month prior to the initiation of works. The purpose of these surveys is to identify sensitive roosting sites.</p> <p>If works run into the subsequent breeding season(s) (April-September), surveys will be conducted to identify sensitive nesting sites. Breeding season surveys will be conducted once per month from April to July inclusive when works are taking place. If works run into the subsequent winter season(s) (October to March), surveys will be repeated to identify sensitive roost sites. These surveys will be conducted at the beginning of each winter season (e.g., October) and continue if evidence of roosting of birds of conservation concern is observed.</p> <p>Surveys will be undertaken by a suitably qualified ornithologist. The survey will comprise a thorough walkover survey of the Proposed Project footprint and/or all works areas to a 500m radius, where access allows. If winter roosts or nests of birds of high conservation concern are identified, the roost/nest will be earmarked for continued monitoring during works. If the roost/nest is found to be active during works, works will cease within a species-specific buffer of its location in line with best practice guidance (Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007) to avoid disturbance. No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied. Aerial surveys using a drone may be used to confirm the presence or absence of roosting/nesting birds, where conditions are suitable.</p>	Once	As required	Project Ornithologist
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			<p>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 will also be marked to alert all personnel on site to the suspension of works within that area.</p>			
MX11	Effects on Cultural Heritage	Chapter 14	<p>Archaeological monitoring under licence from the NMS of any geotechnical / engineering trial pits or investigations will be carried out by a suitably qualified archaeologist. A report detailing the results of the monitoring will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body.</p> <p>Pre-development testing, under licence from the NMS, will be carried out in areas where peat depths allow a meaningful investigation. Testing will only be undertaken in areas where ground disturbance will take place as part of the Proposed Project. Where peat depths become a limitation to testing, monitoring at the construction stage will be undertaken. The areas to be tested will be chosen by the appointed archaeologist and the number of test trenches agreed between the archaeologist and the NMS through the licensing system. A report on the testing will be compiled on completion of the work. Should archaeological finds, structures or deposits be uncovered as a result of the testing 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.</p>	As Required	As Necessary	Suitably Qualified Archaeologist
Construction Phase						

MX12	Health and Safety	<p>ELAR Chapter 4, 5</p> <p>Appendix 4-5</p>	<p>The Project Supervisor Construction Stage (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):</p> <ul style="list-style-type: none"> ➤ 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. <p>Ensure that the following are being carried out:</p> <ul style="list-style-type: none"> ○ 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 SafePass 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 Personal Protective Equipment (PPE) compliance; ○ Monitor the compliance of contractors and others and take corrective action where necessary; and ○ Notify the Planning Authority and the client of non-compliance with any written directions issued. 	Daily	Daily	PSCS
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MX13	Reactive Site Drainage Management	EIAR Chapter 4, 9	<p>The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat potentially silt-laden water from the works areas, will be monitored continuously by the ECoW on-site. The ECoW or project 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.</p> <p>The ECoW or Project Hydrologist will respond to changing weather, ground or drainage conditions on the ground as the Proposed 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.</p>	As required	As Necessary	ECoW
MX14	Water Quality and Monitoring (Daily Visual Inspections)	EIAR Chapter 9 Appendix 4-7	<p>An inspection and maintenance plan for the on-site 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.</p>	Daily	As Necessary	ECoW / Project Hydrologist

			<p>During the construction phase field testing and laboratory analysis of a range of parameters with relevant regulatory limits and EQSs should be undertaken for each primary watercourse along the Proposed Grid Connection Site 33kV underground cable route and specifically following heavy rainfall events (i.e. weekly, monthly and event based).</p> <p>The following periodic inspection regime will be implemented:</p> <ul style="list-style-type: none"> ➤ 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: <ul style="list-style-type: none"> ○ >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). 			
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			<ul style="list-style-type: none"> ➤ 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, <p>A written record will be maintained or available on-site within the CEMP which will be maintained on-site during the construction phase.</p>			
MX15	Water Quality and Monitoring (Continuous Turbidity Monitoring)	Appendix 4-7	<p>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.</p> <p>The proposed locations for continuous, in-situ monitoring will be confirmed by the Project Hydrologist prior to the commencement of the construction phase.</p>	Continuous	Daily	Project Hydrologist
MX16	Water Quality and Monitoring (Laboratory Analysis)	EIAR Chapter 9	<p>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 Project Site with further sampling points added as deemed necessary by the ECoW in consultation with the Project Hydrologist and Site Manager.</p>	As Required	Monthly	ECoW
MX17	Water Quality and Monitoring (Field Monitoring)	Appendix 4-7	<p>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</p>	As Necessary	As Required	ECoW/ Project Hydrologist

			rainfall in any 24-hour period. The Project Hydrologist will monitor and advise on the readings collected by in-situ field monitoring.			
MX18	Biodiversity	Appendix 4-5	<p>The Project Ecologist 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:</p> <ul style="list-style-type: none"> ➤ 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 and ecological issues as they arise. ➤ Provide guidance to contractors to ensure legal compliance with respect to protected species onsite. <ul style="list-style-type: none"> ➤ Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress. 	As required	As required	Project Ecologist
MX19	Birds	ELAR Chapter 7	<p>An Environmental Clerk of Works and Project Ecologist will be appointed, and a suitably qualified ornithologist will undertake bird surveys.</p> <ul style="list-style-type: none"> ➤ 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. 	As Required	As required	Project Ornithologist

			<p>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.</p> <p>In the event that construction works to 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 7.8.1 of Chapter 7.</p>			
MX20	Peat and Spoil Management (Movement Monitoring Posts)	Appendix 4-2	<p>To monitor possible peat movements, it is proposed to install sighting posts upslope and downslope of the access road at staggered intervals at locations where the peat depth is greater than 2.0m, such as along the main entrance road and around T04. 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.</p> <ul style="list-style-type: none"> ➤ A line of sighting posts will comprise: <ul style="list-style-type: none"> ○ 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 road 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 	Daily	Daily	Project Geotechnical Engineer

			<p>be placed down the slope, or at any location where monitoring is deemed necessary by the Designer or the Project Geotechnical Engineer.</p> <ul style="list-style-type: none"> ➤ Each line of sighting posts will be uniquely referenced with each post in the line given a reference. ➤ 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). ➤ 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. ➤ 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. 			
MX21	Peat and Spoil Management (Post-construction monitoring) Instability	Appendix 4-2 Appendix 8-1	To monitor possible peat movements following the construction of the Proposed Project, it is recommended that the Proposed Wind Farm Site is inspected by a suitably qualified engineer once every six months for the first three years following commissioning of the Proposed Project. Particular attention will be given to the peat deposition areas and the proposed borrow pits, as well to any areas where the site drainage is not functioning as intended. Should any signs of instability be noted, a site visit by a suitably qualified geotechnical engineer will be arranged and suitable remediation measures enacted and the site inspections should continue on an annual basis for a further three years.	As required	Every 6 Months	Geotechnical Engineer

		<p>Chapter 9</p> <p>Appendix 4-7</p>	<p>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).</p> <p>Details of the proposed surface water quality monitoring programme are outlined in the Surface Water Management Plan (refer to Appendix 4-7).</p> <p>Criteria for the selection of water sampling points include the following:</p> <ul style="list-style-type: none"> ➤ 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; ➤ It is advantageous if the upstream location is outside/above the forest in order to evaluate the impact of land-uses other than forestry; ➤ Where possible, 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 			
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			<p>increases at third downstream location relative to second downstream location); and,</p> <ul style="list-style-type: none"> ➤ The above sampling strategy will be undertaken for all on-site sub-catchments streams where tree felling is proposed. <p>Also, daily surface water monitoring forms will also be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection.</p>			
MX22	Clear Felling of Coniferous Plantation and Potential Surface Water Quality Effects	Chapter 9	<p>The following items shall be carried out during pre-felling inspections and after:</p> <ul style="list-style-type: none"> ➤ 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. 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 nears 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, <p>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.</p>	Monthly	Monthly	ECoW

MX23	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
MX24	Effects on Cultural Heritage	Chapter 14 Appendix 4-5	<p>Archaeological monitoring will be ongoing during the construction phase of the Proposed Project which is outlined below:</p> <ul style="list-style-type: none"> ➤ Archaeological monitoring under licence from the NMS of any geotechnical / engineering trial pits or investigations will be carried out by a suitably qualified archaeologist. A report detailing the results of the monitoring will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body. ➤ Pre-development testing, under licence from the NMS, will be carried out in areas where peat depths allow a meaningful investigation. Testing will only be undertaken in areas where ground disturbance will take place as part of the Proposed Project. Where peat depths become a limitation to testing, monitoring at the construction stage will be undertaken. The areas to be tested will be chosen by the appointed archaeologist and the number of test trenches agreed between the archaeologist and the NMS through the licensing system. A report on the testing will be compiled on completion of the work. Should archaeological finds, structures or deposits be uncovered as a result of the testing further mitigation measures such as preservation in situ or 	As Necessary	As Required	Suitably Qualified Archaeologist

			<p>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.</p> <ul style="list-style-type: none"> ➤ 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 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. ➤ A walk-over survey of the Proposed Enhancement Site will be carried out post-clear-felling but prior to any other works such as stump flipping or drain blocking. ➤ The location of any potential Cultural Heritage features therein will be recorded and a photographic record made of same. A report on the results of the walk-over survey will be compiled on completion of same and will include any further required mitigation measures such as buffer zones, etc, deemed necessary. ➤ A second phase of walk-over survey will be carried out after stump flipping to ensure that any potential finds, features or deposits, if present, can be recorded and any other mitigation required can be implemented where necessary. 			
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MX25	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	ECoW
Operational Phase						
MX26	Wastewater Management	Chapter 4	The wastewater storage tank alarm will be part of a continuous stream of data from the Proposed Turbines, wind measurement devices and electricity substation extension that will be monitored remotely 24 hours a day, 7 days per week.	Continuous	Daily	ECoW
MX27	Drainage Management	Appendix 4-5 Appendix 4-7	An inspection and maintenance plan for the drainage system onsite will be prepared in advance of commencement of any works on the Proposed Project. Regular inspections of all installed drainage features will be necessary, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water at parts of the systems where it is not intended. The inspection of the drainage system will be the responsibility of the ECoW or the supervising hydrologist.	Weekly	Weekly	ECoW
MX28	Shadow Flicker	Chapter 5	Where daily or annual shadow flicker exceedances are predicted at any inhabitable or third-party dwelling of the identified 15 no. sensitive receptors, a site visit will be undertaken firstly to determine the presence of existing screening and window orientation at each potentially affected property. This will determine if the receptor has an actual line of sight to any turbine and actual potential for shadow flicker to occur. In order to ensure that the model and SCADA system is accurate and working well a site visit will be carried out to verify the system	As Necessary	As Required	Wind Farm Operator

MX29	Bats	EIAR Chapter 6 Appendix 6-1	<p>Bat Monitoring Plan</p> <ul style="list-style-type: none"> ➤ To assess the effects of the Proposed Project on bat activity, 3 years of post-construction monitoring is proposed. Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision. ➤ At the end of each year, the efficacy of the mitigation and monitoring plan will be reviewed, and any identified efficiencies incorporated into the programme. The post-construction surveys will be carried out as per the pre-construction survey effort. ➤ Full spectrum recording detectors will be utilised for the same duration as during pre-application surveys and at the same density (NatureScot, 2021). Carcass searches, to monitor and record bat fatalities, shall be conducted at each turbine in accordance with NatureScot/NIEA Guidance. This shall include searcher efficiency trials and an assessment of scavenger removal rates to determine the appropriate correction factor to be applied in relation to determining an accurate estimate of collision mortality. ➤ Monitoring surveys shall continue in Year 2 and 3, and where a curtailment requirement has been identified, the success of the curtailment strategy shall be assessed in line with the baseline data collected in the preceding year(s). 	Years 1, 2, 3	Annually	Project Ecologist
MX30	Biodiversity	Appendix 6-4	Monitoring will be undertaken by a suitably qualified ecologist and will focus on the enhancement measures provided for marsh fritillary habitat, peatland habitats, and linear habitat planting. Results will be documented within a Monitoring Report, which will identify any shortcomings, recommend corrective actions or amendments where required, and inform updates to management measures.	As required	As required	Project Ecologist

		<p>Monitoring of habitat enhancement will be carried out annually until the proposed habitats have been sufficiently established and have given consistent results for 3 consecutive years after the establishment phase. During this time the Project Ecologist will ascertain whether the establishment methodology needs to be adapted. Once the habitats been successfully established, monitoring can be carried out every other year (years 5, 7, 10, 15 and 20 post-establishment) as deemed appropriate by the Project Ecologist.</p> <p>Marsh Fritillary and Species Diverse Wet Grassland Habitat</p> <p>Marsh fritillary habitat condition assessments will be undertaken throughout the target areas, as per NBDCs marsh fritillary monitoring scheme.</p> <p>Peatland Enhancement</p> <p>High level monitoring assessments will be carried out within the target area for the first 5 years post initial restoration works. These will serve to identify if the restoration works are progressing as planned, in the potential absence of positive habitat condition assessments, which may take some years to establish.</p> <p>In conjunction with the high-level assessments, vegetation monitoring will be undertaken following the methodology set out in Irish Wildlife Manual No. 79 Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland Version 2.0” (Perrin et al, 2014) (IWM 75) to provide a detailed assessment of the blanket bog restoration for the operational life of the prospective development. A minimum of five permanent vegetation monitoring plots, the location of which will be selected to provide a comprehensive coverage of the site condition. Cover and abundance</p>	Annually	As required	Project Ecologist
			Annually	As required	Project Ecologist

			<p>of vascular and bryophyte species will be recorded and it will be assessed as per the condition assessment monitoring criteria as per those that are set out in Appendix V of the IWM 75 in relation to Blanket Bog (7130). Fixed point photography, and aerial imagery collection will also be undertaken at each plot.</p> <p>Monitoring will commence following the completion of the initial restoration works and will be undertaken annually for a period of five years. Following this, it will be surveyed every five years throughout the lifetime of the Proposed Project.</p> <p>Where monitoring reveals that actions need to be undertaken to ensure the success of the project in achieving its aims of restoring Blanket Bog habitat adaptive measures such as dam maintenance, further surface smoothing, seedling removal or furrow/drain blocking will be undertaken as necessary.</p> <p>Recommendations for ongoing or remedial management required will be specified within the Annual Environmental Report.</p> <p>Linear Habitats</p> <p>The entire enhancement area will be walked/surveyed to ensure all planted trees are healthy. Should dead/dying trees be identified, additional planting will be required to fill any gaps.</p>	Years 1, 3, 5, 7, 10, 15, and 20 years	Annually	Project Ecologist
MX31	Birds	<p>ELAR Chapter 7</p> <p>Appendix 7-7</p>	<p>Operational monitoring will be in line with guidelines issued by the NatureScot (NatureScot, 2009 and NatureScot, 2025a). Surveys will be undertaken in Years 1, 2, 3, 5, 10 and 15 of the wind farm's lifetime. Operational monitoring will include the following survey methods:</p>	Years 1-5, 10 and 15	As Necessary	Project Ornithologist

			<ul style="list-style-type: none"> ➤ Flight activity surveys: vantage point surveys. ➤ Distribution and abundance surveys: breeding raptor surveys. <p>Targeted bird collision surveys (corpse searches) will be undertaken by a trained dog and handler. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust.</p>			
MM32	Hen Harrier	Appendix 6-4	<p>The Proposed Hen Harrier Habitat Enhancement Areas will be the subject of annual monitoring to assess the effectiveness of the measures proposed and employed and to contribute to advances in habitat management methods, which can be applied to future similar projects. The monitoring can also aid adaption and implementation of improved methods and measures as they emerge, or intensification of successful measures deployed from farm plan to farm plan. Please refer to Appendix 6-4 for further details.</p> <p>The monitoring measures will include the following during the breeding season:</p> <ul style="list-style-type: none"> ➤ Hen harrier surveys of each of the Proposed Hen Harrier Habitat Enhancement Areas. ➤ Passerine point counts at each of the Proposed Hen Harrier Habitat Enhancement Areas. ➤ Habitat mapping and scoring at each of the Proposed Hen Harrier Habitat Enhancement Areas. <p>Vegetation sampling at each of the Proposed Hen Harrier Habitat Enhancement Areas.</p>	Annually	As Necessary	Project Ornithologist

MX33	Noise and Vibration	EIAR Chapter 12	<p>A Noise Compliance Monitoring Plan will be implemented to verify that operational wind turbine noise complies with any planning conditions.</p> <p>Prior to commissioning, a Noise Compliance Monitoring Protocol will be submitted to and agreed with the planning authority, setting out measurement methodologies, reporting procedures and a complaints management process in accordance with current guidance and best practice.</p> <p>Post-commissioning compliance surveys will be undertaken, typically within six months of operation, following the IOA Good Practice Guide and relevant supplementary guidance. Should any exceedances or noise issues such as tonality or amplitude modulation be identified, appropriate corrective measures will be implemented, including operational controls or curtailment of specific turbines. All complaints will be fully investigated in collaboration with the turbine manufacturer, with further mitigation applied where necessary to ensure ongoing compliance.</p>	Once within six months	As Required	Noise Consultant
MX34	Peat and Spoil Management / Instability	Appendix 4-2 Appendix 8-1	<p>To monitor possible peat movements following the construction of the Proposed Project, it is recommended that the Proposed Wind Farm Site is inspected by a suitably qualified engineer once every six months for the first three years following commissioning of the Proposed Project. Particular attention will be given to the peat storage areas and the borrow pit, as well to any areas where the site drainage is not functioning as intended. Should any signs of instability be noted, a site visit by a suitably qualified geotechnical engineer will be arranged and suitable remediation measures enacted. The site inspections should continue on an annual basis for a further three years.</p>	As required	Every 6 Months	Geotechnical Engineer

9. PROGRAMME OF WORKS

9.1 Construction Schedule

The construction phase will take approximately 18-24 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 9-1 Indicative Construction Schedule

ID	Task Name	Year 1				Year 2			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Site Health and Safety	█	█	█	█	█	█		
2	Underground 33kV Cabling	█	█	█	█		█	█	█
3	Site Compounds	█							
4	Site Roads	█	█	█	█	█	█	█	█
5	Substation Extension and Electrical Works		█	█	█	█	█		
6	Turbine Hardstands		█	█	█	█	█	█	█
7	Turbine Foundations			█	█	█			
8	Backfilling and Landscaping		█	█	█	█	█	█	█
9	Turbine Delivery and Erection				█	█	█		
11	Substation Extension Commissioning						█	█	█
12	Turbine Commissioning						█		

10. COMPLIANCE AND REVIEW

10.1 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.

10.2 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 Proposed Turbines and proposed substation extension.

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 Clare 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.

10.3 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.

10.4

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.

10.5

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.