Construction Environmental Management Plan (CEMP)

Coolglass Wind Farm EIAR Volume 2

Coolglass Wind Farm Limited

Prepared by:

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1.0 Introduction

1.1 Background

This document presents a Construction Environmental Management Plan (CEMP) for Coolglass Wind Farm which sets out the principles and procedures for environmental management during construction of the wind farm (hereafter referred to as the Proposed Development).

Will planning permission be granted, this CEMPwillwill, the CEMP will be a key construction contract document, which will ensure that all mitigation measures, which are considered necessary to protect the environment are implemented.will.

The document will be read in conjunction with **Chapter 2: Site Description and Design Evolution** and **Chapter 3: Description of Development**, of the EIA Report and the required mitigation measures set out in **EIAR Appendix 3.3 Schedule of Environmental Commitments and Mitigation Measures**.

The CEMP is a fluid document that will evolve during the different phases of the project. As such it will be subject to constant review to address:

- any conditions required in the planning consent;
- to ensure it reflects best practice at the time of construction;
- to ensure it incorporates the findings of pre-construction site investigations;
- changes resulting from the construction methods used by the contractor(s); and
- unforeseen conditions encountered during construction.

1.2 Aims and Objectives

The CEMP will be maintained and updated on Site and will be augmented by associated design specifications and Construction (Design and Management) (CDM) 2015 Regulations documentation such as the PSCS's Construction Phase Plan.

Where appropriate, the CEMP, or plans within the CEMP, will form part of the Site induction which will be mandatory for all employees, contractors and visitors attending the Site. All employees and contractors will need to familiarise themselves with the relevant contents of the CEMP and supporting appendices as directed.

Management practices and mitigation measures have been developed for those aspects of the construction works that could potentially affect the environment.

The objectives of the CEMP are to:

- outline the proposed mechanisms for ensuring the delivery of environmental measures to avoid or reduce environmental effects identified;
- ensure procedures are in place so that there is a prompt response to effects requiring remediation, including reporting and any additional mitigation measures required to prevent a recurrence;
- provide the content that willwill be supplied in the construction method statements and strategies that will be prepared in order to secure mitigation measures in relation to different design aspects of the proposed development;

- ensure compliance with legislation and identify where it will be necessary to obtain authorisation from relevant statutory bodies;
- ensure that appropriate proposed development monitoring and reporting will be in place;
- provide a framework for reporting, compliance auditing and inspection to ensure environmental aims will be met; and
- set out the applicant's expectations to guide contractors on their requirements with regards to environmental commitments and environmental management.

1.3 Site Setting

The Proposed Development is located approximately 11km southeast of Portlaoise, 14km northwest of Carlow and 11km east of Abbeyleix. The Proposed Development site includes lands contained within the following townlands: Fossy Upper, Aghoney, Gorreelagh, Knocklead, Scotland, Brennanshill, Monamantry, Coolglass, Crissard, Kylenabehy, County Laois.

The Proposed Development is located across two prominent hills- Fossy Mountain and Wolfhill, comprised of two no. clusters of development and briefly comprises thus:

- The northern cluster of the Proposed Development is comprised of a geographical area defined by Fossy Lower Road at the northernmost extent, the R426 at the westernmost extent, Luggacurren Road at its easternmost extend, and Knocklead Road to its southernmost extent. Elements of the Proposed Development which will be located in the northern cluster, if consented, comprise;
    - 7 no. turbines (turbine nos 1-7) and their associated access tracks, hardstandings and foundations;
    - 1 no. 110 kV substation;
    - 1 no. temporary construction compound (TCC1);
    - 1 no permanent 102.5m meteorological mast;
    - 1 no. site access point (AP1);
    - A recreational amenity trail (part of a future separate planning application);
    - The origin of 2 no. cable routes from the proposed on-site substation (part of a future separate planning application);
    - A 33kV collector cable which connects both clusters to the proposed on-site substation.
- The southern cluster of the Proposed Development is comprised of a geographical area defined by Knocklead Road at its southernmost extent, Crissard Road at its easternmost extent, Knocklead/Moyadd road at its westernmost extent and Slatt Lower road at its southernmost extent. Elements of the Proposed Development which will be located in the southern cluster, if consented, comprise:
    - 6 no. turbines (turbine no's 8-13) and their associated access tracks, hardstandings and foundations;
    - 1 no. Borrow pit;
    - 1 no. temporary construction compound (TCC2);
    - 1 no. site access point (AP2).

Coolglass Wind Farm Limited (the applicant) is applying to An Bord Pleanála for consent for the Proposed Development (as defined in Section 3.1.1).

An approximate National Grid Reference is SF 532 455.

1.4 Project Description

The Proposed Development which consists of a 13 no turbine wind farm development and associated works on land within the townlands of Fossy Upper, Aghoney, Gorreelagh, Knocklead, Scotland, Brennanshill, Monamantry, Coolglass, Crissard, Kylenabehy, Monamanry, Brennanshill, Knocklead, Aghoney, Timahoe, Carrigeen, Ballygormill South, Money Upper, Hophall, Rathleague, Ballymooney, Rathbrennan, County Laois. The site is 731 ha in size. The development will consist of:

- Construction of 13 No. wind turbines within two clusters with an overall ground to blade tip height of 180m. The wind turbines will have a rotor diameter ranging from 155m to 162m inclusive and a hub height ranging from 99 to 102.5m inclusive.
- Construction of permanent turbine hardstands and turbine foundations.
- Construction of 1 no. permanent 110 kV electrical substation including 2 no. control buildings with welfare facilities, all associated electrical plant and equipment, security fencing and gates, all associated underground cabling, wastewater holding tank, and all ancillary structures and works.
- Construction of a 33kV collector cable circuit connecting the wind farm two clusters along the L3851/Knocklead Road
- Construction of two temporary construction compounds with associated temporary site offices, parking areas and security fencing.
- Development of one on-site borrow pit.
- Construction of new permanent internal site access roads, upgrade of existing internal site access roads, including passing bays and all associated drainage infrastructure
- Development of an internal site drainage network and sediment control systems.
- All associated underground electrical and communications cabling connecting the wind turbines to the wind farm substation.
- Ancillary forestry felling to facilitate construction of the development.
- All associated site development works including berms, landscaping, and soil excavation.
- Improvement of a site entrance to an existing access off the L3851/Knocklead local road to include localised widening of the road and creation of a splayed entrance to facilitate the delivery of abnormal loads and turbine component deliveries. Improvements include removal of existing vegetation for visibility splays to facilitate the use of the access for the delivery of construction materials to the site.
- A new site entrance slip road from the L3851 / Knocklead local road to facilitate the delivery of abnormal loads and turbine component deliveries. Works at this location require the removal of existing forestry to facilitate the use of the access for the delivery of construction materials to the site and for use during the operational phase.

- Construction related temporary upgrade works on the turbine delivery route to facilitate the delivery of turbine components to include the use of temporary road surfaces at a roundabout at the southern exit of Junction 16 of the M7, the R425/N80 roundabout and the R426 – L3851 junction.
- The erection of a permanent meteorological mast 102.5m in height

2.0 Implementation

2.1 Implementation and Control

Compliance with the CEMP is the key control measure required during construction to mitigate environmental impact. It documents the principles and processes to be followed to implement all relevant agreed environmental mitigation.

The PSCS will be required to prepare a series of method statements. These method statements will detail how the contractor intends to implement the mitigation set out in the CEMP and will be integrated with their detailed Construction Method Statements.

3.0 Roles and Responsibilities

During construction there will be key responsibilities for the applicant, the PSCS and their teams. Establishing roles and responsibilities in relation to construction will be important in order to ensure the successful construction of the proposed development, including the implementation of the CEMP. The personnel, who will implement, monitor and respond to the CEMP, will be the applicant construction team and the PSCS.

3.1 Safety and Health

The construction works will be undertaken in accordance with primary safety and health legislation, namely:

- Safety, Health and Welfare at Work Act 2005;
- Health and Welfare at Work (General Application) Regulations 2007; and
- Safety, Health and Welfare at Work (Construction) Regulations 2013.

The construction works for the proposed development will fall under the Safety, Health & Welfare at Work (Construction) Regulations 2013. It is a key appointment in the construction process. As such, the Project Supervisor Construction Stage (PSCS) will provide a Construction Phase (Safety & Health) Plan in accordance with the regulations. This plan will include (but not be limited to) a construction programme, emergency procedures, site layouts and fire plans, method statements and details of the proposed induction programme. This induction programme will include both the PSCS's site specific rules as well as the Client's requirements and will include instructions to all staff regarding the Emergency Pollution Prevention Plan (EPPP) and relevant procedures.

An induction will be required for all workers (permanent / temporary / contractor / subcontractor), site visitors, applicant representatives or other 3rd parties. Inductions will be documented.

Plant operators and construction staff will be trained by the PSCS with regard to spill prevention/mitigation measures and procedures and in the use of relevant mitigation material (e.g. spill kits).

Staff and subcontractors employed by the PSCS will be trained and have to prove certification for any plant, vehicle or use of specialist equipment such as electrical and hot works.

3.2 Construction Management Team

The applicant will appoint a Construction Management Team, led by a Construction Site Manager. The team will include, as a minimum, a Resident Engineer.

Prior to appointment of a PSCS, the applicant will own the CEMP and the document will become uncontrolled copies when printed.

It will be the team's responsibility to ensure that the PSCS adheres to and complies with the principles of the CEMP and their Method Statements. This will likely be the responsibility of the Resident Engineer, the ECoW and the applicant Construction Manager. The team will also be responsible for:

- regular liaison with the PSCS's Site Manager;
- maintaining environmental risk registers;
- communicating with regulators and consultees such as the EPA and the local planning authority regarding any changes that need to be made to the CEMP including the Schedule of Mitigation; and
- ensuring that any required changes are approved and updated within the CEMP.

The applicant Construction Manager, ECoW and Resident Engineer will have the power to stop works at any stage will it be deemed necessary, i.e. if there areare risks posed to environmental receptors from construction that can not be mitigated immediately.

3.2.1 Ecological Clerk of Works (ECoW)

An Ecological Clerk of Works (ECoW), will be appointed during the period of construction and post-construction restoration. The appointment of the ECoW will be approved by Laois County Council (LCC).

The purpose of the ECoW will be to provide environmental advice and monitor compliance, not implement measures. The ECoW will have a number of different tasks to carry out during construction and prior to the outset of each construction phase. They will be required to keep an active register of all issues that arise during the works and report as required to LCC, Coillte and the EPA.

The ECoW will have sufficient powers to:

- oversee construction work and identify where mitigation measures are required;
- authorise temporary stoppage of works if required; and
- to review working methods and advise whether alternative or more appropriate working methods require to be adopted.

The ECoW will undertake the following activities:

- to work with the PSCS to induct all site personnel with regards to key environmental sensitivities and mitigation measures to be applied during construction. Toolbox talks shall be given by the ECoW throughout the construction period in the event that additional unforeseen issues arise that require alternative working methods

- undertaking site walkovers, ensuring implementation of the water management plan with reference to water quality protection and appropriate locations for fuel and oil stores;
- liaising with contractors during the construction phase;
- inspecting working areas and ensuring compliance with the CEMP;
- undertaking water quality monitoring;
- providing advice on sediment and drainage management;
- communicating with all site personnel regarding any environmental issues and mitigation measures;
- oversee the need for all necessary licenses regarding protected species are obtained, if required with the support of suitably qualified and experienced Ecologists; and
- documenting and reporting any environmental issues and incidents as required to the applicant, LCC, Coillte and the EPA.

3.2.2 Resident Engineer

The applicant will appoint a Resident Engineer for the construction of the proposed development. The Resident Engineer will provide support to the applicant Construction Management Team and will have day to day responsibility for monitoring the proposed development onsite on behalf of the Construction Manager.

The Resident Engineer will have a wide range of duties including but not limited to:

- overseeing construction works to ensure conformance with the specification, monitoring quality and progress and most importantly ensure that health, safety and the environment is given a high priority at all times. The Resident Engineer will effectively be Developer's eyes and ears on the site and will report directly to the applicant Construction Manager;
- authority to stop the construction works in the case of a health and safety, environmental or quality issue. This will be applicable where to delay will cause additional or prolonged risk or damage;
- daily visual inspections of working areas to identify possible construction issues from a quality, environmental, programme and safety perspective. Any issues will be raised directly with the contractor;
- working closely with the ECoW to ensure that ecological and environmental requirements dictated by the CEMP, best practice and the planning conditions are adhered to by the works contractors;
- reviewing construction related documents from all contractors – including method statements and risk assessments and providing comments directly onsite to the PSCS; and
- reporting all environmental or health and safety incidents and near misses to the Construction Manager in a form and timescale required by the Construction Management Team.

3.3 PSCS

The PSCS will be required to comply with and regularly review the CEMP throughout the construction period.

The PSCS and their team (including any sub-contractors) will be responsible for:

- undertaking their duties in accordance with CDM 2015;
- liaising with the applicant's Construction Management Team;
- completing the construction of the proposed development in a manner which complies with all relevant laws, rules and regulations;
- acquiring licenses and permits as necessary for their works;
- ensuring that all method statements in line with the principals set out in the CEMP have been provided;
- planning, managing, monitoring and coordinating all pertinent activities relating to construction;
- liaising with and providing justification to the regulators and consultees such as the EPA and LCC if any significant changes are required from the Schedule of Mitigation;
- developing and implementing an Environmental Incident Response Plan and ensuring that all personnel (including sub-consultants and sub-contractors) understand and are aware of procedures to be undertaken will an environmental incident occur. This will sit as an additional appendix in the CEMP;
- ensuring that all personnel receive training and are aware of the potential to damage to sensitive environmental receptors and procedures required to be implemented to avoid, minimise and mitigate against such damage;
- verifying the competence and resources of all personnel working on the proposed development and any sub-consultants and sub-contractors that are engaged on the proposed development; and
- implementing the Mitigation Appendix.

3.4 All Site Personnel

All site personnel, including all members of the applicant and PSCS's teams, all sub-contractors and sub-consultants will be required to:

- attend all inductions and site specific training including toolbox talks carried out by the ECoW; and
- implement control measures throughout the site, as required.

3.5 Communication

The applicant will inform LCC prior to any construction starting on site and communication will be maintained with updates of any incidents or significant changes notified within one week of occurrence. The applicant will provide contact details to the LCC of:

- the Resident Engineer – who will be on site for the majority of the construction phase.
- the applicant's Construction Project Manager; and
- the applicant's communication contact.

Any resident who has a question regarding the construction of the proposed development will be directed to one of these contacts. All questions will be logged and responded to within a specified number of days.

Careful monitoring of any complaints received, including recording details of the location of the affected party, time of the disturbance and nature of the issue will assist with managing the works to reduce the likelihood of further incidents.

4.0 Construction Staging

4.1 Site Access

Those activities that may give rise to audible noise at the surrounding properties and heavy goods vehicle deliveries to the site will be limited to the hours 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays. Turbine deliveries will only take place outside these times with the prior consent of the Council and An Garda Síochána.. Those activities that are unlikely to give rise to noise audible at the site boundary will continue outside of the stated hours.

The Site Manager will be responsible for developing and implementing a Site Traffic Management Plan as set out in **Chapter 12: Traffic and Transportation**. The applicant will work in partnership with LCC and the supply chain to reduce the impact of the development on the local community.

Parking for staff and contractors will be situated within the boundary of the site for the duration of the works as far as is reasonably practicable. All vehicles will reverse park to improve safety of the site.

An appropriate speed limit (section 5.3.1) will apply for vehicles onsite and will be selected, monitored and enforced by the PSCS. Maximum vehicle load capacities will not be exceeded.

4.2 Construction

The following phases will be taken into consideration for the construction works:

- Phase 1 – Site set-up:
  - widening of 2 site entrances along L3851if required;
  - construction of access track approach to compound location;
  - site compound set-up, including installation of welfare facilities;
- Phase 2 – Construction:
  - construction of access tracks;
  - construction of turbine foundations and crane hardstandings;
  - construction of substation, including all civil and electrical works;
  - installation of Proposed Development cabling;
- Phase 3 – Commissioning:
  - turbine delivery and construction;
  - Proposed Development commissioning;
  - turbine and wind farm reliability run;
- Phase 4 – Demobilisation:
  - take over;

- snagging; and
- decommissioning of temporary compounds / structures and restoration of the site.

A detailed construction programme will be provided by the PSCS as part of the final CEMP and the Construction Phase Plan.

4.3 Post Construction Reinstatement

Good practice techniques for vegetation and habitat reinstatement as defined in the Project Habitat Species Management Plan (HSMP)will be adopted and implemented on areas subject to disturbance during construction as soon as practicable.

The following reinstatement works will be implemented:

- re-use of turves;
- re-use of topsoil/peat where appropriate; and
- reseeding with appropriate species.

For clarity, the following are definitions for the different soil make-up of the natural ground between the surface and rockhead (from top down):

(a) Vegetation:

This is typically plant matter that can be removed/stripped above the ground level (i.e. does not include roots/topsoil). This can vary depending on the nature of the vegetation encountered on site.

(b) Turf/Turves:

This is typically a layer of matted earth formed by grass and plant roots. The matted earth layer will normally be 30-50mm thick.

(c) Topsoil:

The upper layer of soil usually containing significantly more organic matter than is found in lower layers. This can vary in depth but is typically 200mm thick. This can be excavated with the turf and depends on whether the turf is required elsewhere, or the topsoil needs to exclude the turf.

(d) Superficial Soils:

This is a generic term used for all material between topsoil and rockhead. This can vary in depth and content throughout the depth profile at any location.

(e) Weathered Rock:

This is a layer that may exist above rockhead that is neither rock nor superficial material but a mixture of both. It can be mostly fractured rockhead as a result of physical and chemical weathering processes. When excavated it may have elements of fractured rock and superficial material as the boundary can be difficult to distinguish.

In some cases this can provide suitable engineering material for construction of foundations, embankments, tracks etc.

(f) Rockhead:

This is a naturally occurring solid aggregate of minerals which lies beneath the superficial soils.

5.0 General Construction Good Practice

5.1 Handling of Excavated Materials

The construction of tracks, turbine foundations and crane hardstanding areas as well as the establishment of the construction compound, substation compound will require the stripping and excavation of soil and its reuse or temporary storage. Excavations will generate material comprising peat, soil and rock. Description of the existing land, soils and geological setting is provided in EIAR **Chapter 8 Land, Soils and Geology**. Where possible, soils and peat will be used for reinstatement works associated with access tracks, cable trenches, turbine foundations, crane hardstandings and the temporary construction area. The upper vegetated turves will be used to dress infrastructure edges and to replace stripped and stored turves.

Excavated material will be used as soon as practicable and as close as possible to the area it is excavated from, however some temporary storage will be required. Soils in areas taken for temporary use will be stockpiled close to excavation location.

5.2 Materials Storage

Granular, non-organic material required to be stored temporarily will be compacted, to reduce the potential for erosion and transfer of sediment and stockpiled in designated areas at least 50m from a watercourse. Temporary stockpiles will need to be appropriately sited away from marshy grassland, bog or heath where possible, with the locations agreed in advance with the ECoW.

Where soils can not be transferred immediately to an appropriate restoration area, short term storage will be required. In this case, the following good practice will apply:

- soil will be stored around the turbine perimeters at a sufficient distance from the cut face to prevent overburden induced failure;
- local gullies, diffuse drainage lines (or very wet ground) and locally steep slopes will be avoided for storage;
- stored upper turves (incorporating vegetation) will be reinstated adjacent to similar habitats as advised by the ECoW;
- monitoring of stockpiles/excavation areas will occur during and following rainfall events; and
- if material is stockpiled on a slope, silt fences shall be utilised to reduce sediment transport in accordance with CIRA guidance C532. Additional measures may also be necessary to control flow of water and sediment transport on site in accordance with this guidance.

Material excavated during new and upgraded access track construction will be stored adjacent to the track and Granular, non-organic material compacted in order to limit instability and erosion potential. There is no peat on the Proposed Development Site.

Silt fences shall be employed in combination with the measures described in 'CIRA Control of water pollution from construction sites. Guidance for consultants and contractors (C532)' where required to minimise sediment levels in run-off.

All soils stripped from the borrow pit(s) will be retained in clearly demarcated stockpiles of no greater than 3m height in locations immediately around the edges of borrow pit excavation.

5.3 The Management and Movement of Concrete

5.3.1 Accidental Spillage

An appropriately sized spill kit(s) will be provided and maintained onsite, consideration will be given to suitable locations across the active areas of the site and to having vehicles including plant carry a spill kit. All vehicles will also have a spill kit. This kit will contain materials, such as absorbent granules and pads, absorbent booms and collection bags. These are designed to halt the spread of spillages and will be deployed, as necessary, will a spillage occur elsewhere within the construction compound.

A speed limit of 15mph will apply for vehicles onsite and will be monitored and enforced by the PSCS. Maximum vehicle load capacities will not be exceeded.

5.3.2 Vehicle Washing

There will be a wash-out facility within the construction compound consisting of a sump overlain with a geosynthetic membrane. The geosynthetic membrane will filter out the concrete fines leaving water to pass through to the sump. The sump water will either be pumped to a licenced carrier and taken offsite for approved disposal. No washing of concrete-associated vehicles will be undertaken outside the wash out facility, and the area will be signposted, with all site contractors informed of the locations.

5.3.3 Concrete Pouring for Turbine Foundations

To prevent pollution incidents, all concrete pours are planned and specific procedures will be adopted in accordance with Construction Industry Research and Information Association (CIRIA) C532 Control of water pollution from construction sites: guidance for consultants and contractors. These procedures will include:

- ensuring that all excavations are sufficiently dewatered before concrete pours begin and that dewatering continues while the concrete cures. Construction good practice will be followed to ensure that fresh concrete is isolated from the dewatering system;
- ensuring that covers are available for freshly placed concrete to avoid the surface of the concrete washing away during heavy precipitation; and
- perimeter drains with the installation of silt traps.

The excavated area will be back-filled with compacted layers of graded material from the original excavation, where this is suitable, and capped with soil. The finished surface around the base of each turbine, will be capped with crushed aggregate providing a walkway to allow for safe personnel access.

5.4 Surplus and Waste Material

5.4.1 Introduction

A Waste Management Plan (WMP) will be prepared in line with the relevant National Waste Management Guidelines and the European Waste Management Hierarchy, as enshrined in the Waste Management Act 1996, as amended.

The WMP will detail how all waste materials will be managed, including the management of excavated materials.

The PSCS will ensure that all waste from the site is dealt with in accordance with the requirements under the above Acts and that materials will be handled efficiently, and waste managed appropriately.

Appropriate waste management, disposal and waste carrier documentation and licences will be obtained (e.g. complete waste transfer notes prior to waste leaving site, ensure all waste carriers have a valid waste carrier's registration certificate, ensure wastes are disposed of at a correctly licensed facility (please note the facilities listed in Chapter 3 of Volume 2 of the accompanying EIAR), complete notification for hazardous waste to the EPA).

Waste streams will include wastes generated by plant, machinery and construction workers over the period of the works, for example waste oils, sewage, refuse (paper, carton, plastic etc.), wooden pallets, waste batteries, fluorescent tubes etc.

5.4.2 Soils and Spoils

Any materials excavated on site in the course of the construction works will be stored on site ideally close to the excavation location and re-used where it is appropriate to do so. As such, offsite disposal of this material is not anticipated.

5.4.3 Hazardous and Other Wastes

Table 5-1 lists some of the waste types that may be generated during the construction works. Although some waste types may be generated in locations other than the construction compounds such waste materials will be stored within the construction compounds only. Waste materials generated outside the construction compounds will be taken to the compounds on a daily basis to be managed thereafter.

Table 5-1: Common Construction Wastes

EWC Code	Description
13 01 10*	Used mineral hydraulic oil (non-chlorinated)
13 02 08*	Other waste engine, gear or lube oil
13 02 05*	Waste engine, gear or lube oil (non-chlorinated)
13 02 08*	Other waste engine, gear or lube oil
16 01 07*	Oil filters
20 01 23*	Discarded equipment containing CFCs e.g. waste fridges & freezers
16 06 01*	Lead batteries
16 07 08*	Oily waste from transport and storage tanks
16 10 01*	Hazardous liquid wastes to be treated off-site
20 01 21*	Fluorescent tubes and other mercury-containing waste
20 01 33*	Hazardous batteries and accumulators that are collected separately
15 02 02*	Absorbents, filter materials, wiping cloths, clothing contaminated by dangerous substances
15 01 01	Cardboard or paper packaging
15 01 02	Plastic packaging e.g. toner & ink cartridges, polythene sheeting
15 01 03	Wooden packaging e.g. timber pallets

EWC Code	Description
15 01 04	Metallic packaging e.g. drink cans, paint tins
16 01 03	Tyres
16 01 15	Antifreeze fluids that do not contain dangerous substances e.g. Coolants
16 01 17	Ferrous metal from vehicles e.g. car parts
16 02 14	Non-hazardous waste electricals e.g. washing machines, power tools
16 05 05	Gases in pressure containers i.e. gas cylinders
17 01 01	Concrete
17 02 01	Wood from construction or demolition e.g. timber trusses, supports, frames, doors
17 04 11	Cables that do not contain dangerous substances e.g. electric cabling
20 01 01	Paper & card similar to that from households e.g. office paper, junk mail
20 01 30	Non-hazardous detergent e.g. flushing agent/universal cleaner
20 01 39	Separately collected plastics e.g. plastic containers, bottles
20 03 01	Mixed waste similar to that from households e.g. mixed office, kitchen & general waste
20 03 04	Septic tank sludge

*Denotes Hazardous Waste, as categorised by the European Waste Catalogue.

Foul water from the onsite facilities at the construction works compound will be removed from site by an appropriately licensed contractor (see also Section 7.4.4).

5.4.4 Regulatory Compliance

Waste will be transferred to a licensed waste management. The PSCS will need to check that the site is licensed and that the licence permits the site to take the type and quantity of waste involved. Copies of the waste management licence will be held on file.

A record of waste movements willwill be completed by all parties involved and will be retained for a period of two years. Sub-contractors hauling waste offsite will complete their own waster movement records and copy them to the PSCS.

It will be the responsibility of the PSCS to ensure that other parties involved in the transport, storage and disposal of waste are legally entitled to carry out their duties.

5.5 Dust Mitigation

Good practice measures as listed below will be adopted during construction to control the generation and dispersion of dust such that significant impacts on neighbouring habitats will not occur. The hierarchy for mitigation will be prevention – suppression – containment:

- The internal access roads will be constructed prior to the commencement of other major construction activities. These roads will be finished with graded aggregate;
- A water bowser will be available to spray work areas (wind turbine area and grid connection route) and haul roads, especially during periods of excavations works coinciding with dry periods of weather, in order to suppress dust migration from the site;
- All loads which could cause a dust nuisance will be covered to minimise the potential for fugitive emissions during transport;

- Gravel will be used at the site exit point to remove any dirt from tyres and tracks before travelling along public roads;
- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- The access and egress of construction vehicles will be controlled to designated locations, along defined routes, with all vehicles required to comply with onsite speed limits;
- Construction vehicles and machinery will be serviced and in good working order;
- Wheel washing facilities will be provided at the entrance/exit point of the Proposed Development site;
- The developer in association with the contractor will be required to implement a dust control plan as part of the CEMP. In the event the Planning Authority decides to grant permission for the Proposed Development, the CEMP will address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned by the Planning Authority or as required by the ECoW.
- Receptors which receive dusting and soiling from local routes entering the site; and dwellings directly adjacent to the grid connection route construction that experience dust soiling, where appropriate, and with the agreement of the landowner, will have the facades of their dwelling cleaned if required will soiling have taken place;
- Ensure all vehicles switch off engines when stationary – no idling vehicles; and
- Exhaust emissions from vehicles operating within the site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised through regular servicing of machinery.

5.6 Noise Management

The sources of construction noise are temporary and vary both in location and their duration as the different elements of the site are constructed, and arise primarily through the operation of large items of plant and equipment such as bulldozers, diesel generators, vibration plates, concrete mixer trucks, rollers etc. Noise also arises due to the temporary increase in construction traffic near the site. The level of noise varies depending on the different elements of the site being constructed.

The predicted noise levels from onsite construction activity from the Proposed development are predominantly below the noise limit for the threshold of significance. Some tasks, whilst at shortest distance to the nearest NSR, have the potential to exceed the limit for a period. To reduce the potential effects of construction noise, the following types of mitigation measures are proposed:

- Those activities that may give rise to audible noise at the surrounding properties and heavy goods vehicle deliveries to the site will be limited to the hours 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays. Turbine deliveries will only take place outside these times with the prior consent of the Council and the An Garda Síochána.. Those activities that are unlikely to give rise to noise audible at the site boundary will continue outside of the stated hours.
- All construction activities shall adhere to good practice as set out in BS 5228.

- All equipment will be maintained in good working order and any associated noise attenuation such as engine casing and exhaust silencers shall remain always fitted.
- Where flexibility exists, activities will be separated from residential neighbours by the maximum possible distances.
- A site management regime will be developed to control the movement of vehicles to and from the Development site.
- Construction plant capable of generating significant noise and vibration levels will be operated in a manner to restrict the duration of the higher magnitude levels.

5.7 Site Lighting

Temporary site lighting will be occasionally required for specific activities to ensure safe working conditions, during periods of limited natural light but will be carried out within the limits of the permissible working hours. The type of lighting will be non-intrusive and specifically designed to negate or minimise any effect to local properties and any other environmental considerations.

Given the proposed size and scope of the development, it is most likely that the construction timetable will require elements of the works to be undertaken during periods of the year when natural daylight is limited.

The use of artificial lighting may therefore be required in order to facilitate the works, such as vehicle and plant headlights; construction and compound lighting; office complex lighting; and localised floodlights/mobile lighting units. There will be fewer requirements for artificial lighting in the summer months when natural lighting will be present during normal working hours. There are no known issues with regards to the limit of lighting levels in this area, but lighting will be provided to meet the required lighting levels for the respective works which are being undertaken, especially where there is plant and machinery involved. Any issues identified with regards to limiting the lighting levels, either the lux values, or the time/duration of the lighting will be amended with the guidance of the ECoW as part of the developed construction method statement.

5.8 Vehicle Storage

Appropriate areas will be provided adjacent to or within the site compound to allow staff and visitor vehicles to be parked. In addition, appropriate provision will be made for the layover of HGV traffic, to ensure that the adjacent road remains clear and available for use at all times. The track design incorporates spurs and crane pads which from time to time could be required to temporarily store vehicles i.e. as waiting areas.

6.0 Pollution Prevention Measures

6.1 Environmental Incident and Emergency Response Plan

The PSCS will be responsible for developing and implementing an Environmental Incident and Emergency Response Plan. The plan will provide reference to procedures to be followed in the event of a specific incident. if an environmental incident occurred, the following actionswill take place immediately:

- mitigation will be implemented to stop or reduce impacts from the incident;
- if these are ineffective, work in the area will cease immediately;

- if necessary, monitoring will be undertaken to identify the source of the incident if not immediately obvious;
- work will only recommence once it is considered that it will not continue to adversely impact sensitive environmental receptors; and
- provision of a full report by the PSCS and separately by the ECoW to the applicant following an incident occurring.

The Environmental Incident and Emergency Response Plan will reflect site-specific conditions/issues. The PSCS will submit the detailed Plan to the applicant for approval prior to any construction works commencing onsite. The Plan will provide:

- a summary of local environmental sensitivities, e.g. environmentally designated areas, protected species or habitats and high amenity areas;
- a description of the construction works and appropriate references to other environmental plans and construction method statements;
- an inventory of stored materials and emergency response spill kits;
- details on training requirements, evidence of training of site staff / plant operators in emergency response procedures including inclusion of Environmental Incident and Response training in site inductions and tool box talks; and key staff contacts for environmental management and emergency response;
- detailed procedures to be taken in the event of an incident or emergency (including procedures for positioning and movement of plant) and identification of relevant personnel who will be responsible for implementing such procedures; and
- contact telephone numbers for the emergency services and the EPA Pollution out of hours Lo Call number (0818 33 55 99).

A plan of the site will also be provided, detailing:

- all areas of potential pollution sources including the locations of car parks, delivery and fuel / chemical storage areas, oil separator equipment, excavations, and any other high risk areas that could give rise to pollution;
- the location of potential sensitive environmental receptors, including sensitive habitats or species, surface watercourses, drains or culverts where pollution may travel to; and
- the location of spill kits and other pollution control or emergency response equipment.

The procedures for responding to a major pollution incident will be a regular topic at onsite tool box talks and management meetings in order to ensure that the incident response plan is fully understood by all personnel, and that all involved know their role in it. Any lessons learnt from any response to real incidents will be fed back into the plan to ensure that best practice is followed.

6.2 Re-Fuelling of Vehicles, Plant and Machinery

Re-fuelling of mobile plant and machinery will be carried out at a designated location within the site.

Vehicle re-fuelling will take place either at a dedicated impermeable refuelling pad or by mobile double bunded bowsers at their place of work. The refuelling pad will have an impermeable base and bund with a capacity of 110% with sumps provided such that they

do not drain directly into the surface water drains. Drainage will be passed through oil interceptors prior to discharge. Refuelling will be carried out using an approved mobile fuel bowser with a suitable pump and hose. Absorbent material (spill kits) will be available onsite and will be deployed to contain drips and small spillages.

All other fuels, oils and potential contaminants, as well as waste oils, will be stored in secure, fit for purpose containers within bunded containment as appropriate and in accordance with the EPA guidance. The bunded containment will have a capacity of 110% of the volume to be stored and will have impervious, secured walls and base. Maintenance of mobile plant will take place within the construction compounds only and will comply with relevant EPA guidance.

There will be no fuel storage outside the contractors designated site. Plant will be maintained in good operational order and any fuel/oil leaks recorded for attention. Absorbent pads/granules in the case of an accidental leak/spillage will be available at the temporary construction compound.

6.3 Spillage

Spillage of fuel, oil and chemicals will be minimised by implementation of an Emergency Response Plan (ERP) which will be prepared by the PSCS. In the event of any spillage or pollution of any watercourse the emergency spill procedures as described in the ERP will be implemented immediately. Procedures developed in the ERP will be adhered to for storage of fuels and other potentially contaminative materials to minimise the potential for accidental spillage.

6.4 Other Storage

Stone material stockpiles will be limited to within work areas. This material will be transported and deposited directly to the point of use from the storage point.

Stripped topsoil/superficial soil will be stockpiled in a suitable location away from the area of movement of heavy vehicles, machinery and equipment, to minimise compaction of soil. Stockpiling of excavated material will be managed such that the potential contamination of down slope water supplies and/or natural drainage systems is mitigated / minimised.

Low mound stockpiles will be formed from excavated material, adjacent to construction areas, away from open drains.

Waste storage and raw material will be at the construction works compound and will be suitably stockpiled in a safe manner that prevents any migration of silts/contamination.

6.5 Prevention of Mud and Debris on Public Roads

Plant and wheel washing facilities and road sweepers will be provided as required to prevent mud and deposits from being transferred from site onto the public roads.

Plant and wheel washing, where provided, will be located within the designated hard standings at least 10m from the nearest watercourse or surface water drain. Runoff from the facilities will be captured within a purpose designed system for recycling and re-use where possible within the site. Settled solids will be regularly removed and disposed of by an appropriately licensed contractor.

6.6 Cement

It is anticipated that ready-mixed concrete will be brought onto the construction site from an offsite source for use as required.

Any bagged cement will be stored within a soil bunded area on pallets above the ground and covered with secured plastic sheeting to minimise the risk of wind-blown cement and uncontrolled washout occurring.

Any spilled cement will be removed by shovelling/excavator and suitably disposed offsite.

6.7 Waste and Litter

Waste storage/recycling materials will be stored at the designated location on site. Section 5.4 details principles for waste minimisation, recycling and disposal of waste streams.

With respect to the control of litter on site, all such waste will be collected and stored within sealed containers within the site compound and serviced by a registered waste carrier. No disposal of litter will be permitted at other locations.

6.8 Hydrocarbon Contamination

6.8.1 Vehicle Maintenance

As noted in Section 5.0, plant and machinery will be regularly maintained to ensure that the potential for fuel or oil leaks/spillages is minimised. All maintenance will be conducted on suitable absorbent spill pads to minimise the potential for groundwater and surface water pollution. All machinery will be equipped with drip pans to contain minor fuel spillage or equipment leakages.

6.8.2 Chemical Storage

All fuels, oils and other chemicals will be stored in secure, fit for purpose containers within bunded containment as appropriate and in accordance with EPA guidance. The bunded containment will have a capacity of 110% of the volume to be stored and will have impervious, secured walls and base.

The bunded area will be underlain by an impermeable ground membrane layer to reduce the potential pathways for contaminants to enter watercourses and groundwater.

7.0 Drainage and Surface Water Management

7.1 Introduction

Control of water is of great importance during construction to prevent exposed soils eroding and silting up surrounding drainage channels and watercourses. It is essential that the works have little or no impact on the existing hydrology in order to minimise potential impact on ecology and environmental quality of the surrounding area.

The following could be used across the site to adequately protect hydrological, and related, resources.

7.2 Site Induction and Training

All employees and contractors will undergo a site induction to ensure that they are familiar with the site rules prior to any work commencing on site. In addition, the PSCS will ensure that all operatives and contractors responsible for handling fuel, oil, concrete or cement or other potential pollutants undergo a thorough induction programme with respect to the relevant proposed pollution control measures. The relevant programme will include, as a minimum, the following:

- waste management;
- emergency response plan procedures;
- materials management;
- habitat and species protection,
- surface water management;
- potential sources of pollution and their effects on the environment;
- requirements of the contract and legislation with respect to pollution;
- the PSCS's pollution avoidance plan;
- traffic management and routing, including areas where access is not permitted; and
- training in the use of pollution control equipment.

7.3 Site Drainage

During the construction phase of the proposed development, measures will be adopted, in order to prevent silt, chemicals and/or other contaminants from being washed into existing watercourses. Areas exposed due to the removal of existing structures and/or vegetation are more susceptible to erosion during heavy rainfall so areas will be reinstated as soon as possible to minimise this effect.

This will include control of pollution to the water environment around the following aspects of site infrastructure:

- access routes;
- foundations;
- hardstanding areas and new structures

The appropriate methodologies to cover water control and the means of drainage from all hard surfaces and structures within the site are described in the following sections.

7.4 Management of Sediment and Surface Waters

Good practice construction techniques will be adopted for the management of sediment and surface water run-off generated during the construction phase of the proposed development. Sustainable Drainage Systems (SuDS) will be used where applicable.

Drainage from the site will include elements of SuDS design. SuDS replicate natural drainage patterns and have a number of benefits:

- SuDS will attenuate run-off, thus reducing peak flow and any flooding issues that might arise downstream; and

- SuDS will treat run-off, which can reduce sediment and pollutant volumes in run-off before discharging back into the water environment; and

In addition, a wet weather protocol will be implemented to manage activities during periods of heavy and prolonged precipitation to be approved by LCC.

Heavy or prolonged rainfall during construction and operation may lead to sediment transport or vegetation causing blockage to infrastructure drainage channels or any temporary watercourse crossing structures. Regular monitoring and prompt maintenance of these assets will ensure that the drainage system continues to function as designed.

7.5 Foul Drainage

Effluent and waste from onsite construction personnel will be captured and stored for offsite disposal by a licensed contractor, where there is no connection to the public foul sewer

8.0 Water Quality Monitoring and Contingency

8.1 Water Quality Monitoring

Water quality monitoring during the construction phase will be undertaken for the surface water catchments that serve the site, to ensure that none of the tributaries of the main channels are carrying pollutants or suspended solids. Monitoring will be carried out monthly on these catchments.

With regard to the protection of the water environment the following risks will be addressed:

- siltation of watercourses;
- discolouration of raw water;
- potential pollution from construction traffic due to diesel spillage or similar;
- alteration of raw water quality resulting from imported track construction material;
- excavation and earthworks
- use of large quantities of concrete;
- site compound and associated drainage/foul drainage and diesel spill issues; and
- the PSCS will compile a monitoring and maintenance plan for the drainage system and surface water runs which will as a minimum include:
  - visual monitoring/inspections

during site works including and water crossing construction works, the relevant drainage/surface water runs potentially being impacted by these works will be inspected on a daily basis by the ECoW while works are ongoing in this area.

A Water Quality Monitoring Plan (WQMP) will be developed to form part of the Construction Method Statement (CMS), which will be submitted to the appropriate planning authorities prior to construction and development. The WQMP will be implemented to monitor surface water quality, fish populations and macroinvertebrate community prior to, during and post-construction. A robust baseline of water quality in surface watercourses / drainage channels downstream of construction works will be

established prior to construction commencing and used a benchmark of water quality for the construction phase monitoring.

The purpose of the WQMP is to:

- ensure that the commitments put forward in the EIA Report are fulfilled with regards to identified ground and surface water receptors;
- provide a specification for monitoring prior to, during and after construction;
- provide a record of water quality across the site that can be compared to rainfall and site activities;
- provide reassurance of the effectiveness of pollution prevention measures installed to protect surface watercourses throughout the construction period; and
- provide data to identify any potential pollution incidents, and to inform a structured approach to manage and control such incidences.

The WQMP will outline details for the monitoring of surface watercourses down gradient of works areas including watercourse crossings, access tracks, turbine foundations and borrow pits and at control sites (up gradient of works areas), and will include:

- planning level monitoring locations;
- frequency of monitoring prior to, during and after construction;
- parameters for field hydrochemistry testing and laboratory analysis including as a minimum pH, electrical conductivity, suspended solids, dissolved metals, nutrients and hydrocarbons;
- sampling and analysis protocols;
- relevant environmental quality standards (EQS);
- responsibilities for monitoring –the ECoW will be responsible for daily monitoring of watercourses particularly around active works areas and watercourse crossings. Further monitoring on a less frequent basis (i.e. monthly) may be done by an external party;
- procedures to be followed in the event of an environmental incident; and
- recording and communicating of results.

A Private Water Supply (PWS) Action Plan will be developed and will include details regarding all water monitoring and reporting, pollution incident reporting and emergency mitigation measures to address a temporary or permanent material change in either the quality or quantity of an existing private water supply. The PWS Action plan shall include as a minimum:

- the provision of an emergency hotline telephone number for householders so that they can contact the project with any concern regarding water quality or quantity;
- the contact details of householders downgradient of work areas to alert in the event of a pollution incident;
- the provision of an alternative water supply, if required, during any periods of PWS disruption; and/or
- to supply affected properties with filters for particulate removal.

8.2 Laboratory Analysis

This monitoring will involve laboratory analysis of water samples taken at agreed locations across the site and will continue throughout the construction phase and immediately following construction. Monitoring will be used to allow a rapid response to any pollution incident as well as assess the impact of good practice or remedial measures. Monitoring frequency will increase during the construction phase.

The performance of the good practice measures will be kept under constant review by the water monitoring schedule, based on a comparison of data taken during the construction phase with a baseline data set, sampled prior to the construction period and through the observance of any trends in water quality change over time.

8.3 Emergency Response

Drainage networks provide a conduit for rapid transport of silty water and potential contamination from surface spills of fuels / oils, concrete or chemicals. A pollution emergancy incident will include any discharge to the drainage network that could potentially cause environmental damage. Examples of pollution emergency incidents include:

- fuel drips or spills during refuelling;
- leaking plant or equipment;
- leaks from fuel or chemical containers;
- contaminated water or sediment / silt entering a watercourse or drainage network;
- windblown dust and waste;
- excess silt deposition in drainage ditches, channels, culverts following heavy rainfall events;
- operational failures of pumps and pipelines; and
- failures of treatment or sediment controls.

The PSCS will be required to prepare an Environmental Incident and Emergency Response Plan (Section 6.1) which will provide emergency response contacts, reporting procedures, and procedures for dealing with all potential pollution incidents during the construction of the proposed development.

8.4 Specific Measures for Protecting Groundwater Receptors

Areas of potential GWDTE are sustained by surface water and rainfall rather than by groundwater. Measures will be required to sustain surface water flow paths to maintain these habitats.

9.0 Construction Phase

9.1 Introduction

This section describes in more detail the key components of construction and the impact they may have on the environment.

The overall site design has been developed in accordance with recommendations adopted from the EIA Report and to reflect the requirements and specifications for transporting wind turbine components to the proposed turbine locations.

9.2 Temporary Compound

The works will include the construction of two Temporary Construction Compounds (TCCs), located at TC1 655313,687358, TC2 656514,686243.

The temporary construction compounds will have a footprint of 120m x 60m (7,200m^2), and will contain the following:

- temporary modular building(s) to be used as a site office;
- welfare facilities;
- parking for construction staff and visitors;
- reception area;
- fuelling point or mobile fuel bowser;
- secure storage areas for tools; and
- waste storage facilities.

Welfare facilities will be provided for the duration of the construction period in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013. Facilities for waste management, refuelling, power, water supply and chemical/material storage will be provided.

Where and when compound lighting is required, it will be designed to minimise light pollution to the surrounding area. All lights will face inwards.

The compound will also be used as a storage compound for various components, fuels and materials required for construction.

The compound will be built by stripping topsoil and regrading, then laying geotextile and an imported stone layer. The stripped topsoil will be stored adjacent to the compound in a linear bund typically no greater than 2m in elevation. Superficial soil will be stripped and stored separately from the topsoil. This will be stored in a similar manner to the topsoil but will depend on the volume which is required to be excavated.

It is proposed that uncontaminated surface run-off from the compound is accommodated in a swale or soakaway which will be constructed as a perimeter ditch to avoid contamination of watercourses will there be a spillage and from fines washout. All other run-off from the site will follow natural drainage patterns and newly installed drainage routes.

The compound area will be reinstated at the end of the construction period. Reinstatement will involve removal of the imported material and underlying geotextile. The exposed substrate will be gently ripped and the stored superficial soil and topsoil replaced. The surface will be re-seeded as required using the same seed mix as that used for the reinstatement of track verges and batter.

9.3 Welfare Facilities and Services

Welfare facilities will be provided in accordance with Safety, Health and Welfare at Work (Construction) Regulations 2013 during the construction period and will include mobile toilets with provision for sealed waste storage and removal. Sewage waste will be be

tankered offsite by a licensed approved waste contractor, including regular emptying by an approved contractor.

Potable water will be imported as bottled water. The water will be used for messing purposes during the construction phase.

The welfare facilities will most likely have in-built water bowsers to provide a water supply for sanitation etc.

Electricity will be provided by onsite generators. All electrical equipment and its installation and maintenance will be undertaken by a qualified and competent person.

9.4 Transport Routes

Both construction workers and materials needed for the construction works will be delivered to site using the public road network. A Construction Traffic Management Plan (CTMP) has been provided (see Technical Appendix 12.2 found in Volume 3 of this EIAR.

The proposed abnormal load route required to transport turbine components to the site is shown on **EIAR Figure 12.5.** The turbine delivery route will leave Dublin port and join with the M50 motorway via the Dublin Port Tunnel. The transport will continue along the M50, exiting the M50 onto the N7 National Road / M7 Motorway; the transport will continue west before exiting the N7 at Junction 16.

The transport route exits the motorway at Junction 16 to travel west on the R425 for a short distance before heading south on the R426, through the town of Timahoe. The transport will continue along the R426 Regional Road before heading east on Knocklead Road before accessing either the southern or northern clusters via existing forestry tracks.

The proposed abnormal load route has been assessed and verified for the movement of wind turbine components (including blade, tower sections and nacelle), transported as abnormal loads. Abnormal indivisible loads (AILs) are those which exceed the length, weight or height criteria defined in 'Road Traffic (Permits for Specialised Vehicles) Regulations 2009, S.I. No. 147 of 2009', and 'Road Traffic (Specialised Vehicle Permits) (Amendment) Regulations 2010, S.I. 461 of 2010

It is anticipated that HGVs and deliveries will travel predominantly from Portlaoise to the north as this is the largest town in the vicinity of the Site, with a small percentage travelling along the R426 from the south. Light vehicles are likely to travel from both directions along the R426.

Full detail of the assessment of effects on the road network is provided in **Chapter 12: Site Access, Traffic and Transport.**

In the event consent has been received and prior to construction, the route will be further inspected by suitable engineers, in conjunction with the police and the relevant highway authorities, with a view to finalising the TMP and to obtaining a suitable licence for the movement of abnormal loads.

9.5 Borrow Pits

1.1.1 General

In order to construct the access tracks, passing places and formation of new hardstanding areas such as crane pads, site construction compounds and laydown areas, crushed rock is required. It is proposed to source this material from one no. onsite borrow pit, to reduce the need to import materials.

These borrow pits will be stripped back of topsoil which will be stored adjacent to the respective borrow pit site for future reinstatement.

9.5.1 Materials Storage

Prior to the excavation of the borrow pit(s) and following construction of appropriate SuDS measures, vegetation and soils will be removed and stored in overburden stockpiles. Overburden stockpiles will be located adjacent to the borrow pit(s) and compacted in order to limit instability and erosion potential. Silt fences will be employed to minimise sediment levels in runoff from the stockpiles.

Rock stockpiles will be stored in already-worked areas of the borrow pit(s) or, before these are available, stockpiles will be located on safe and stable designated areas approved by a qualified engineer, identified on a plan of the working area of the borrow pit(s) and agreed with the ECoW.

Overburden or rock stockpiles will be stored at least 50m from watercourses in order to reduce the potential for sediment to be transferred into the wider hydrological system.

9.5.2 Surface Water Management

Temporary interception bunds and drainage ditches will be constructed upslope of the borrow pit(s) to prevent surface water runoff from entering the excavation. Swales will also be implemented to convey and attenuate excess surface water flow away from borrow pit(s). These methods will be kept to a minimal depth and gradient, with check dams, silt traps and buffer strips also utilised where possible to minimise erosion and sedimentation at peak flows.

Infiltration trenches will also be placed downslope of the borrow pit(s) and overburden and rock stockpiles and will be designed to treat run-off before discharging back into the drainage network. Silt fences will be used to intercept sediment-laden surface run-off in addition to infiltration trenches.

9.5.3 Borrow Pit Dewatering

Limited dewatering of the borrow pit(s) may be necessary. Water will be treated by a settlement lagoon(s) and by discharge onto vegetated surfaces.

Outflow from settlement lagoon(s) in proximity to the borrow pit(s) will discharge to surface water drains (please see accompanying planning drawings).

It is unlikely that groundwater ingress will be significant. However, the floors of the borrow pit(s) will have a gravity drain design. All floor water will drain to an adequately sized sump to allow sediment to settle out before discharge to surrounding vegetated surfaces.

Excavation machinery will be regularly maintained to ensure that there is minimal potential for fuel or oil leaks/spillages to occur. All maintenance will be conducted on suitable absorbent spill pads to minimise the potential for groundwater and surface water pollution.

9.6 Access Tracks

9.6.1 General

The extent of construction disturbance will be limited to around the perimeter of, and adjacent to, access track alignments, including associated earthworks, and will be monitored by the ECoW as required.

As part of the design mitigation all of the proposed infrastructure will be sited at least 50m from any watercourse and there will be no new watercourse crossings.

It is anticipated that access tracks will be constructed from aggregate won from onsite borrow pits and will be constructed to the best practices for wind farm access tracks.

Access tracks will be constructed to a minimum running width of 5m (wider on bends), plus willers of approximately 1m on either side, to accommodate the maximum transport requirements. Track willers may be up to a width of 3m to accommodate cabling along the access track alignment.

The access tracks for the proposed development have been carefully designed. The tracks have been designed to follow the existing contours to minimise the requirement for cut and fill and will be formed to minimise the gradient. The access tracks will be a minimum of 5m wide (straight sections) with appropriate widening on bends (please refer to the accompanying planning drawings) with additional provision of inter-visible passing places at track junctions and crane hardstandings. The average working corridor for the construction of access tracks (and where relevant cable trenches) will be 14m.

For the construction of tracks topsoil will be stored beside the track for use in reinstatement of willers at the end of the construction period where appropriate. The material will be stored/stockpiled in accordance with good practice so that it will be reused for reinstatement.

9.6.2 Existing Tracks

There is approximately 5km of existing access track within the site boundary, which will be used to access the main part of the proposed development site.

9.6.3 New/ Upgraded Tracks

There will be up to approximately 14.3km of internal access tracks required to be upgraded as part of the proposed development.

Access tracks will be formed on suitable underlying material (superficial soil or rock with sufficient bearing capacity) in the following manner:

- stripping of surface vegetation (turves) and careful stockpiling of this material;
- excavating the remaining superficial soil materials and stockpiling this material;
- where different superficial materials are present these will be stored according to type. This material will be monitored and watered (as appropriate) to be retained for reinstatement purposes;
- the exposed suitable track formation will have rock fill material tipped from dumper trucks directly onto the proposed access track alignment; and
- this material will then be either spread by a dozer or placed by a hydraulic excavator and compacted in layers, typically using vibratory rollers.

Access tracks will be formed from a sub-base of general fill and finished off with a cap-stone / wearing course of graded crushed rock to provide a nominal Type-B (Series 800) finish. Wearing course stone will be of a suitable material that is not susceptible to breaking down / weathering to a high fines content material.

Maintenance of the running surface will be carried out on a regular basis, as required, to prevent undue deterioration. Loose track material generated during the use of access tracks will be prevented from reaching watercourses by maintaining an adequate cross fall

on the tracks. Periodic maintenance of tracks by way of brushing or scraping will be carried out to minimise the generation of wheel ruts, which could lead to some track material being washed away. In dry weather, dust suppression methods may be required for track and hardstanding areas. The site access tracks, hardstandings and trackside drains will be inspected on a regular basis by the Contractor.

9.6.4 Cut Tracks and Drainage

In areas where the soil is wet the track formation will be created by a cut (and fill) or by a cut operation where the side slope is severe. A lateral drain will be established on the uphill side of the track to drain water from the slopes and cross drains will be established at intervals of no less than 30m, or to suit the profile of the track/ditch to facilitate drainage. Topsoil, where present, will be stored beside the track for use in re-instatement of track willers where appropriate.

9.6.5 Management of Surface Water

New access tracks will be designed to have adequate cross fall or camber to avoid ponding of rainwater and surface run-off. Run-off from the access tracks and existing drainage ditches will be directed into swales that intercept, filtrate and convey the runoff.

Check dams will be installed within the swales and existing drainage ditches where required in order to increase the attenuation of run-off and allow sediment to drop out.

Permanent swales and drainage ditches adjacent to access tracks will have outlets at required intervals to reduce the volume of water collected in a single channel and, therefore, reduce the potential for erosion. Outfall pipes will drain into a bunded section of the drainage ditch to allow suspended solids to settle. Further measures will include the use of flocculent to further facilitate the settlement of suspended solids, if required by the Local Authority.

The PSCS will be responsible for the management of all surface water runoff, including the design and management of a drainage scheme compliant with SuDS principles.

9.6.6 Protection of Watercourse Crossings

Upgraded watercourse crossings will be appropriately designed so that they do not alter the natural drainage and can accommodate flow. All access road 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.

9.6.7 Loose Track Material

Loose material from the use of access tracks will be prevented from entering watercourses by utilising the following measures:

- silt fences will be erected between areas at risk of erosion and watercourses;
- silt fences and swales will be inspected daily and cleaned out as required to ensure their continued effectiveness;
- excess silt will be disposed of in designated areas at least 50m away from any watercourses or drainage ditches;
- water bars will be implemented on slopes greater than 1 in 20;
- culverts, swales and drains will be checked after periods of heavy precipitation;

- the inlets and outlets of settlement lagoons, retention basins and extended detention basins will be checked on a daily basis for blockages; and
- the access tracks will be inspected on a daily basis for areas where water collects and ponds.

9.6.8 Floating Tracks and Drainage

If

Floating track construction essentially comprises the laying of a geosynthetic (geotextile mat or geogrid reinforcement) across the superficial soils prior to constructing the track. Where necessary, risk from run-off will be mitigated by directing drainage to settlement ponds. Erosion processes on the track side embankments and cuttings will be mitigated by ensuring that gradients are below stability thresholds, which will also enable effective regeneration of vegetation or reseeding with appropriate species. Sediment traps will be required in the early years following construction until natural regeneration/ reseeding is established. Will significant erosion or sedimentation, (which is not expected) take place at any location it will be addressed by re-grading of slopes.

9.6.9 Onsite Vehicle Movements

Access tracks will be designed to be single track, a minimum of 5m wide including the provision of intervisible passing places at appropriate locations taking account of horizontal and vertical track alignments. Additional widening will be provided on bends to facilitate the movement of the large delivery vehicles associated with turbine tower and blade delivery, and these will double as passing places where appropriate.

During the periods of delivery of the large components, the Contractor will use appropriate site communications and access control techniques to enable safe one-way operation of the tracks.

The presence of crane pads within the construction compound will facilitate traffic movement onsite. Internal track junctions will also be used to facilitate multiple options for construction traffic movement. This will allow vehicle to move more direct between construction locations and double as passing places.

9.6.10 Unstable Ground

While not predicted, unstable ground is herein considered to be any ground conditions encountered along the proposed alignment, or within the immediate vicinity and influence, of the access tracks that has insufficient strength in its existing state to support the proposed load conditions.

If any unstable ground is encountered during access track construction, the following procedure will be adopted:

- access track construction in the immediate area of the unstable ground will cease with immediate effect;
- the PSCS will immediately assess the situation and develop a solution; and

9.6.11 Signage

Sufficient signage will be employed onsite, for both site personnel and the public, to clearly define the boundary of the works where they coincide with areas accessible to the public.

9.7 Turbine Foundations

9.7.1 General

A total of 13 turbines will be erected on reinforced concrete gravity foundations, approximately 30m diameter.

Proposed turbine foundation locations will be inspected by the ECoW to ensure that all potential environmental constraints have been identified, demarcated and/or mitigated for prior to the on-set of construction in that area. Construction of Turbine Foundations

The volume of concrete required for each turbine foundation will be approximately 1400m^3 and will be batched onsite using imported cement and aggregates either imported or sourced from the borrow pits. Each turbine will also require steel reinforcement which will be delivered to site on a flatbed vehicle and then connected together to provide the reinforcing cage (see **Figure 3)**.

The turbines require reinforced concrete foundations that measure approximately 30m in diameter. To facilitate the construction of this, an area up to 3m wider around the perimeter will be required e.g. approximately 36m total diameter to create a working area.

Figure 3 shows a planning level turbine foundation design.

The following construction activities associated with the turbine foundations are detailed as follows:

- stripping of surface vegetation (turves) and careful stockpiling of this material as per CEMP requirements;
- excavating the remaining superficial soil and rock materials and stockpiling of this material as per CEMP requirements;
- the stockpiled materials are to be retained for restoration purposes;
- soil will be excavated until a suitable formation can be achieved. Where rock is encountered this will most likely be removed by mechanical excavation to the required depth and material stockpiled as described above. The potential impacts associated with the use of hydraulic breakers or other such vibratory equipment in the vicinity of sensitive ecological receptors or watercourses will be assessed and appropriate mitigation measures implemented where required in consultation with the ECoW;
- the foundation design is based on the most efficient use of materials and local ground conditions;
- temporary fencing will be erected at locations where there are safety implications for any persons likely to be present on the site e.g. around open excavations. Signage will be displayed clearly to indicate deep excavations and any other relevant hazards associated with the foundation excavation works;
- cut-off ditches will be used at the perimeter of foundation excavations to divert the clean water away from the work areas thereby reducing the volume of water potentially requiring pumping/treatment in silt traps/settlement lagoons. It is not anticipated that large scale dewatering will be required during the excavations. Water from dewatering of excavations will be pumped via surface silt traps to ensure that sediment does not enter surrounding watercourses. Settlement lagoons will be employed in areas where the level of runoff is likely to exceed levels normally contained within a silt trap, however it is considered unlikely that these will be

required. Wash-out areas at each base, (if required) will be lined and contained to prevent wash-out water entering drainage/surface waters. The material from the wash-out will be disposed of appropriately offsite (see Chapter 3);

- following excavation, levels will be set to allow the blinding concrete to be placed and finished to the required line and level;
- the steel reinforcement will then be finished to the required design specification. The steel reinforcement will then be delivered to site and stockpiled adjacent to the respective turbine base;
- the formwork will be pre-fabricated of sufficient quality and robustness to allow repeated use. Formwork will be cleaned after each use and re-sprayed or painted with mould oil within the blinded foundation excavation prior to being fixed in place. The placement of containers with mould oil will be strictly monitored to ensure that storage is only in bunded areas (i.e. in the TCC) on sealed hardstanding. Spraying of mould oil and storage of such sprayed materials will be undertaken in such a way as to avoid pollution;
- sulphate resistant concrete or other suitable concrete, as appropriate for the prevailing ground conditions, will be used in the turbine base. Prior to pouring the base concrete, the overall quality of the steel fixing will be checked to ensure there is sufficient rigidity to cope with the weight of personnel and small plant during the pour. The quantity, size and spacing of the reinforcement bars will be checked against the construction drawings to ensure compliance with the design detail. The position of the foundation insert, or other appropriately designed foundation mechanism supplied by the turbine manufacturer will be checked to ensure that the level is within the prescribed tolerances. A check will also be carried out to make sure the correct cover from edge of reinforcement to edge of concrete is maintained throughout the structure. A splay will be formed on all external corners;
- cable ducts will be checked so as not to leave sharp corners that will cause cable snagging. All earthing cable or strip connections will also be examined to prove their adequacy to withstand the rigors of the concrete placing process;
- concrete will be batched onsite. As with all concrete deliveries, a record will be kept against each turbine to indicate the source of supply, type and consistency of the mix. A record will also be kept of the personnel involved, the time and date the pour commenced and finished;
- the concrete pour will commence after the blinding concrete has been cleaned of debris and other loose material. Vibrating pokers will have been checked to ensure they are fuelled by compressed air and in good working order. The pour will proceed under the control of the Contractor. Personal Protective Equipment (PPE) will be worn by the site operatives. Pouring will follow best working practice procedures and fresh concrete will be protected from hot and cold weather as required;
- shutters will be carefully loosened, removed and cleaned no earlier than 24 hours from the finish of the pour; and

backfilling to the turbine base will proceed in layers of approximately 0.3m with compaction as necessary. Further layers of material will be laid until the original till level is attained. Soil will be replaced from the appropriate storage area until the original ground level is reached, or a shallow mound (up to 500mm above existing ground level) is formed. In the event that there is limited onsite material to compact above the turbine foundation, then imported material may be required. This will be a well graded granular product.

A checklist for each foundation will be prepared to show compliance with the documents of each step of the installation process. These lists, once completed, will be stored in the contractor's QA file along with relevant cube test results, and be available for inspection at all times.

Following the completion of all construction activities, the area surrounding the base will be reinstated.

9.8 Crane Pads

Crane pads will be required to allow installation and removal of the turbine components. As with access tracks, topsoil and superficial soil will be removed wherever possible and stored separately adjacent to the removal area for later reinstatement up to the edge of the hardstanding.

The area will be set out to the required dimensions and excavated to a suitable formation. Coarse rock fill will then be placed and compacted in layers using compaction equipment. Geotextile may be used depending on the suitability of the underlying strata. The final surface will be formed from selected granular material and trimmed to allow surface water run-off to drainage ditches. The crane pad will remain *in-situ* for the operational life of the proposed development.

Figure 4 shows the planning level crane hardstanding layout.

9.9 Substation Compound and Control Building

9.9.1 Substation Compound

The main substation compound will include an area for car parking and High Voltage (HV) equipment, such as transformers and circuit breakers and a control building.

Lighting will be limited within the compound to emergency flood lights around the switchgear, security/motion sensor lights to building, and then any internal lighting within the building.

9.9.2 Control Building

The main control building will be a single storey blockwork structure or pre-fabricated panels, built on a pre-cast concrete base measuring approximately 15m x 25m and 5m high. It is proposed that the building will have a rendered finish; the final external finishes will be agreed with LCC. The control building will be used as a control room for the electrical switchgear.

A planning level control building elevation is shown in **Figure 6**.

Welfare facilities including a toilet will be provided in the control building for the duration of the operation of the proposed development. Sewage waste will be tankered offsite by a licensed approved waste contractor.

A rainwater collection and purification system will be installed to service the welfare room, and electricity will be provided from a local electricity connection or a back-up diesel generator.

9.10 Cable Laying

For the purposes of this CEMP, two cable routes will be assessed and the most suitable (see Chapter 1 and 3) will be taken forward into a separate planning application.

- Option 1 comprises a cable route between the proposed onsite substation and the Pinewoods substation. This route is 9.9km in length.
- Option 2 comprises a cable route between the proposed onsite substation and Coolnabacky substation. This route is 10.1km in length.

Underground power cables will run from each turbine location to the onsite substation. s. Cables will be laid in a trenching operation. Single cable trenches will likely be 450mm wide; whilst double cable trenches could extend to 1300-1640mm wide. Trenches will be 1075-1205mm deep. Planning level cable trench arrangements are shown on **Figure 9**.

Electrical cabling is buried or ducted adjacent to the access track network. Cable trenches will either be excavated into existing ground, made ground (such as access track verges) or areas consisting of shallow peat. Irrespective, the cable trenches will require excavation, laying of the cables and backfilling with original material from the point of origin.

The position of trenches will be marked out and the line stripped of turves and superficial soils and set aside for reinstatement. Ecologically sensitive areas will be avoided by construction plant or vehicles. The majority of cable run installation will be undertaken adjacent to and within the track construction zone, to minimise intrusion into the surrounding areas.

Following testing, the trench will be backfilled and compacted in layers with suitable material and reinstated with previously excavated superficial soils (from which stones will have been removed). Sand will be imported to site and will be placed around the cables as protection. Suitable duct marker tape will be installed in the trench prior to backfilling.

Clay bunds will be placed at intervals to prevent longitudinal drainage.

9.11 Soil Storage

Superficial soils will be excavated and stored temporarily. Most of the soil resources within areas directly affected by construction activities will be able to be stored and reinstated as close as possible to where they are excavated in accordance with best practice; so that the site will be restored with minimal movement of material from its original location.

At turbine foundations topsoil will be stripped keeping the top 200mm of turf intact. This material will be stored adjacent to the base working area and will be limited in height to 2m to minimise the risk of overheating. Superficial soil will then be stripped and stored, keeping this material separate from the topsoil.

Following excavation of the turbine foundation area and construction of the foundation (concrete/reinforced steel) the area will be backfilled with spoil. The area will be reinstated using the retained topsoil/turf where appropriate materials are available. Where required a gravel area will be left around the tower base for access. Reinstatement at turbine foundations will begin as soon as possible after foundation and plinth installation is complete.

The risk of water pollution from excavation works in terms of sediment loss will be prevented / mitigated by the following measures:

- careful location of turbine bases and track line to minimise excavation where applicable;
- stripped topsoil/superficial soil will not be stored adjacent or in close proximity to watercourses, where a construction area requiring soil stripping is close to a watercourse the soil will be stored a suitable distance from the watercourse;

- soil will be stored in accordance with best practice in order to remain intact as the soil will be essential to the site reinstatement;
- where turf requires excavation for track construction an excavator will lift turf and place it to the side leaving space between the edge of the track and the embankment to be constructed. The excavator will then lift out the soil and will place it to the side of the proposed track. The soil stored by the side of the access track will be graded by an excavator and the turves will be replaced by the excavator over the graded soil beside the track. The timescale for this operation is short and the methodology has been successfully applied at other wind farms; and
- excavated soil will not be placed onto water reservoirs or placed where it will block established surface or drainage channels.

9.12 Watercourses

9.12.1 General

As part of the design mitigation, all wind turbines and associated infrastructure (with the exception of tracks) have been sited with a minimum separation of 50m from watercourses where possible.

Tracks have been routed to minimise any crossing of the watercourse, where possible. However, if track crossings are required, then the these will be constructed.

Chapter 10: Hydrology, Hydrogeology, Geology and Soils of the EIA Report will include details of water crossings.

All access road 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.

All construction works on the site, and specifically construction works to be undertaken within and in the vicinity of the watercourse, will be completed in compliance with best practice as detailed within this document.

The ECoW will be consulted on all watercourse crossing works. Surveys by the ECoW will be carried out immediately prior to construction of the crossing.

9.12.2 Best Practice

General good practice in watercourse crossing design is detailed below:

- where appropriate, the watercourse will be routed through culverts appropriately sized and designed not to impede the flow of water and will allow safe passage for wildlife, such as fish, water voles, otters etc. (i.e. the crossings will have a capacity well in excess of the design flow);
- when installing culverts, care will be taken to ensure that the construction does not pose a permanent obstruction to migrating species of fish, or riparian mammals (i.e. the crossing will make provision for fish and wildlife migration);
- culverts will be sized so that they do not interfere with the bed of the stream during construction, (i.e. the crossing will leave the watercourse in as natural condition as possible);

- culverts with a single orifice will be used in preference to a series of smaller culverts that may be more likely to become blocked with flotsam and create erosion (i.e. the crossing will not constrict the channel);
- ease and speed of construction are important to minimise disruption to the watercourse and surrounding habitat;
- designed for the life of the project;
- low maintenance; and
- visually in keeping with the surroundings.

In accordance with OPW guidance, the watercourse crossing will be designed on a case by case basis to be appropriate for the width of watercourse being crossed, and the prevailing ecological and hydrological situation (i.e. the "sensitivity" of the watercourse). A number of factors, both environmental and engineering will influence the selection of structure type and the design of the crossing.

The river crossing will be designed to convey a minimum 1 in 200 year plus climate change return period flood event, and individually sized and designed to suit the specific requirements and constraints of its location.

The watercourse crossing will include splash boards and run-off diversion measures to prevent direct siltation of watercourses.

9.12.3 Culverts

Medium to large culverts or large Armco culverts will be used where a culverted solution is desirable or where a small piped culvert is not appropriate for environmental or capacity reasons.

9.12.4 Relevant Mitigation

The following is a summary of the mitigation measures and general good practice associated with the development of watercourse crossing:

- appropriate care will be given to the construction of the crossing and all loose materials left from construction will be collected and disposed accordingly;
- site track crossings will be constructed with granular materials, which will limit the production of surface runoff and the direct discharge of sediment into the watercourse;
- the methods of drainage proposed for the site tracks prevent the significant discharge of surface runoff and suspended solids into the watercourse adjacent to the tracks. This is owing to the runoff being collected within the upslope ditch, the presence of culverts at appropriate intervals so as to limit longitudinal flow and the discharging of water to the downslope ground. There will therefore be no long runs of ditches that directly discharge into watercourse;
- the watercourse crossing will be designed to avoid disruption and / or habitat loss to aquatic systems or to affect free passage of fish; and
- minimum buffer strip of 50m will be kept free from development from the top of the banks of any watercourse/waterbody.

10.0 Pre-Construction Surveys, Protected Species and Monitoring

10.1 Water Quality Monitoring

Prior to the works commencing, baseline water quality monitoring will be undertaken by an appropriately qualified and experienced independent consultant to establish the water quality prior to any interference from the works.

The monitoring shall be undertaken in accordance with the WQMP developed by the Project Supervisor Construction Stage (PSCS) and as detailed within Section 8.0.

This water quality monitoring is to be agreed and reviewed by the Developer in advance of the works commencing to ensure that the conditions during the monitoring and the testing undertaken are representative and allow a suitable benchmark to be established.

10.2 Archaeology/ Cultural Heritage

Monitoring, in the form of a watching brief will be conducted on all ground-breaking works within the site due to the potential for preservation of previously unrecorded archaeology. Due to the nature of the landscape and its historical value, archaeological monitoring will prevent any loss of knowledge from the landscape. Any monitoring will be undertaken by a suitably qualified and licensed archaeologist. Ecology

Mitigation measures to prevent adverse effects on downstream Natura 2000 sites during construction are provided in full in the NIS (Technical Appendix 15.10 found in Volume III of this EIAR). These will ensure no deterioration in the quality of water entering the River Barrow and River Nore SAC, the River Nore SPA and Royal Canal pNHA and will ensure there will be impacts on any QI habitats and species. The same is true for IEF non-QI aquatic habitats and species.

These measures are taken from Chapter 9 and the CEMP (Technical Appendix 3.2 found in Volume III of this EIAR).

Within the design of the proposal, good practice environmental and pollution control measures will be ~~are~~ employed regarding current best practice guidance such as~~, but not limited to,~~ the following:

- CIRIA C648, 'Control of Pollution from Linear Construction Project' (2006);
- CIRIA C532, 'Control of water pollution from construction sites: guidance for consultants and contractors' (2001);
- CIRIA C741, 'Environmental good practice on site guide' (2015, 4th edition);
- CIRIA C697, 'SuDS and Maintenance Manual; (2007);
- IFI, 'Requirements for the Protection of Fisheries Habitats during Construction and Development Works at River Sites'; and
- Design took account of IFI consultation to minimise the number of watercourse crossings and to ensure there were appropriate set-back distances between any infrastructure and watercourses (see Chapter 9).

Mitigation measures in the NIS include implementing the requirements in the following guidance:

- Forestry and Water Quality Guidelines – Forest Service (DMNR, 2000)13;
- Code of Best Forest Practice – Ireland;

- Forestry and Freshwater Pearl Mussel Requirements – Site Assessment and Mitigation Measures (Forest Service, 2009) 15; and
- Forest Operations & Water Quality Guidelines (Coillte, 2009).

The Forest Service of the Department of Agriculture, Fisheries and Food implements the principles of Sustainable Forest Management through its environmental guidelines 'Code for best forestry practice Ireland' and its inspection and monitoring procedures. The Forest Service also has guidance in relation to freshwater pearl mussel: 'Forestry and Freshwater Pearl Mussel Requirements – Site Assessment and Mitigation Measures' to further develop its commitment to environmental protection. This document gives specific mitigation measures which are mandatory in specific locations and circumstances in the designated Freshwater Pearl Mussel catchments such as the Barrow and Nore. Within these catchments particular emphasis is placed upon the area that lies within 6 km hydrological distance of an identified Freshwater Pearl Mussel (FPM) population. From the River Barrow and River Nore SAC Conservation objectives, the location of Pearl mussel is between 13 km and 20 km from the p~~P~~roposed d~~D~~evelopment, and therefore the mitigation methods for FPM will not be required and the 'Forest Service Guideline' will be ~~required~~ implemented instead.

Drainage will be based on a Sustainable Drainage System (SuDS) through minimising, interception, treatment dispersal and dilution. The SWMP specifies how water pollution will not occur as a result of construction activity for the p~~P~~roposed d~~D~~evelopment. It has also been designed to regulate the rate of surface water run- off, encourage settlement of sediment locally and to minimise the quantity of sediment laden storm water.

Erosion control (i.e. preventing sediment runoff) is more effective than sediment control for the prevention of water pollution, this principle will be adopted in the SWMP. Erosion control measures are less likely to fail during times of high rainfall, require less maintenance and are more cost effective. The works programme will include the ensuring the following controls are in place before site clearance or earth works are commenced:

- Erosion control;
- Sediment control;
- Drainage control; and
- Runoff control.

Once works on site have commenced, the area of exposed ground will be minimised, runoff will be prevented from entering the site from adjacent ground, appropriate control and containment measures will be undertaken. Monitoring and maintenance of erosion and sediment controls will occur throughout the p~~P~~roposed d~~D~~evelopment. Establishing vegetation as soon as practical where soil is exposed will also be a priority.

All silt and erosion control measures will be based on the peak flow set out in CIRIA (2006).

10.2.1 Habitat and Species Management Plan

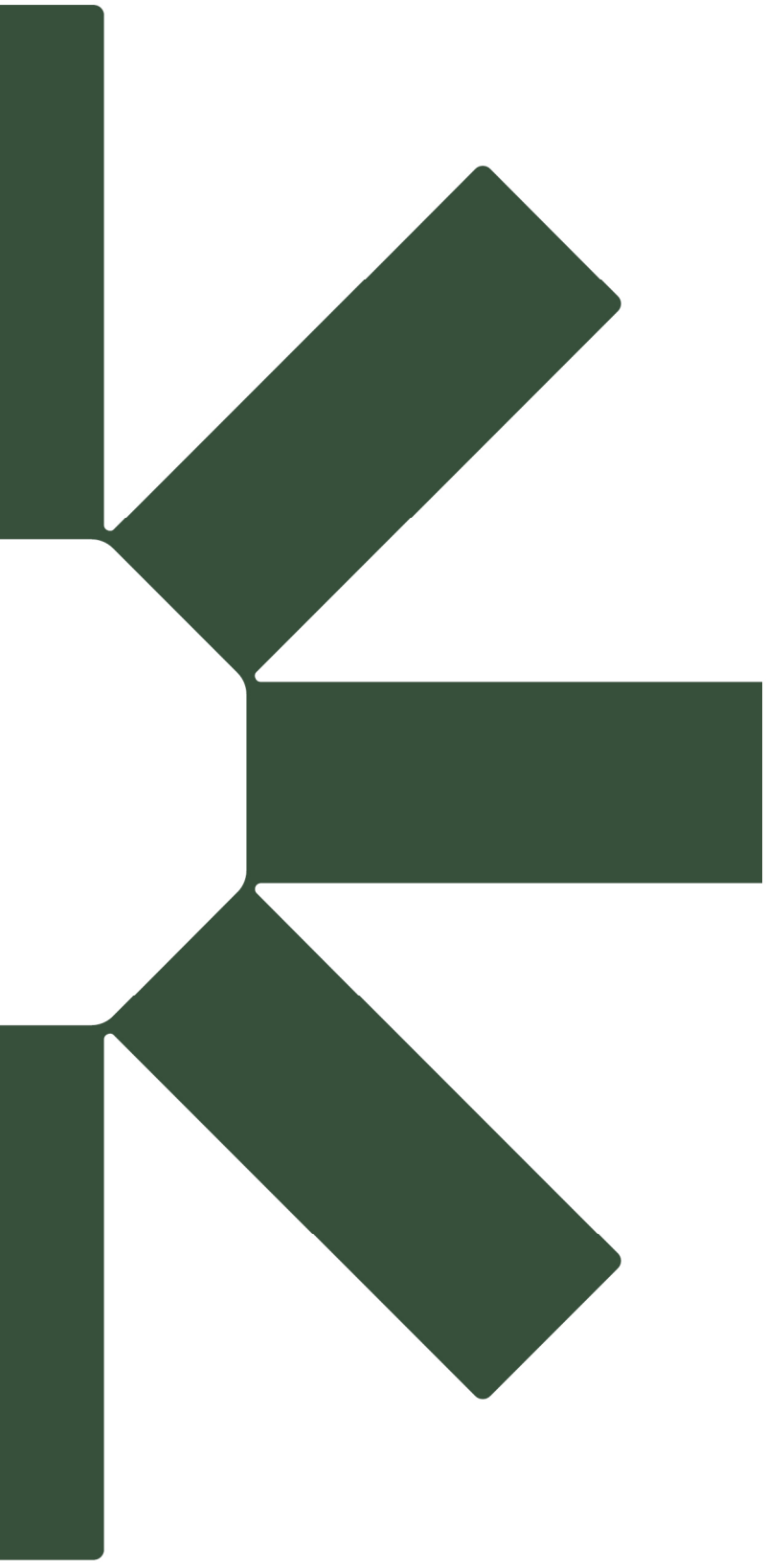
A Habitat and Species Management Plan (HASMP) will be used to prevent the spread of invasive and non-native species and is contained in Appendix 15.11. In particular, quarry material will be treated to ensure that invasive third-schedule Japanese knotweed (plus other non-native plants) is not spread during construction works and any works near watercourses will not spread invasive third-schedule Canadian pondweed.

A pre-construction walkover survey of the works corridor will confirm the presence of any invasive/non-native species that may have escaped into the area since the baseline surveys are conducted.

11.0 Reinstatement

During construction of the infrastructure elements (detailed in Section 9), the vegetated layer will be stripped over the area of the excavation and stored locally with the growing side up. The remaining organic topsoil and subsoils will be excavated down to formation level, or a suitable stratum, and again will be stored local to the point of excavation but shall remain segregated to avoid mixing of materials.

For all reinstated areas, immediate aftercare provision will include an inspection of reinstated areas after completion of the reinstatement work at each location. In addition, the operator will make regular maintenance visits to the site and will visually monitor the success of re-vegetation.



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