

APPENDIX B-2

Construction Environmental Management Plan (CEMP)

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Construction Environmental Management Plan (CEMP)

Drumnahough Windfarm

(Project Ref. LN100039)

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

DRUMNAHOUGH WINDFARM

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GLOSSARY

The following defines some of the terms used throughout this document:

The Employer – The Client i.e. the entity commissioning the construction of the wind farm and associated civil infrastructure. That is, Drumnahough Designated Activity Company (DAC).

The Contractor / Principal Contractor (PC) – The *Contractor* responsible for Civil Infrastructure; the Contractor as defined in the Safety, Health and Welfare at Work (Construction) Regulations 2013.

Decommissioning – Decommissioning is a process including the partial removal of the wind farm components and infrastructure. Decommissioning may occur for the entire wind farm after its natural operational phase. Decommissioning of one or more turbines as part of upgrade / replacement works may also occur. Decommissioning works will involve similar tasks / impacts as construction works and will be subject to additional detailed proposals to be submitted to the Planning Authority prior to the commencement of the decommissioning works.

Development Run-off – Run-off from site infrastructure that may contain suspended solids, silt or other organic matter that requires treatment before discharging to the water environment.

Environmental (Ecological) Clerk of Works (ECoW) – The ECoW is an independent specialist appointed by the *Employer* or the *Contractor*, typically with an ecological background, albeit with practical experience of broad environmental issues associated with construction. In accordance with relevant planning conditions, applicable regulations and best practice, the ECoW monitors environmental compliance and provides advice to the *Employer* and *Contractor* where required. The ECoW role and associated responsibility is outlined in this document.

Archaeological Clerk of Works (ACoW) – The ACoW is an independent specialist appointed by the *Employer*. In accordance with relevant planning conditions, applicable regulations and best practice, the ACoW monitors the construction works to ensure protection of cultural heritage assets and buried archaeological remains. The ACoW provides advice to the *Employer* and *Contractor* where required. The ACoW role and associated responsibility is outlined in this document.

Geotechnical Engineer – The Geotechnical Engineer is a technical specialist appointed by the *Contractor*. The Geotechnical Engineer monitors the construction works, ensuring that excavations and material stockpiles are managed in an appropriate manner to prevent the occurrence of material instability and peat slides. The Geotechnical Engineer provides advice to the *Employer* and *Contractor* where required. The Geotechnical Engineer role and associated responsibility is outlined in the Works Information (and this CEMP).

Greenfield Run-off – Surface water run-off from adjacent undisturbed land that does not require treatment prior to discharging to the environment.

Reinstatement – Reinstatement works are generally undertaken during construction and aim to redress damage inflicted on the landscape as part of the construction process. Reinstatement is undertaken as soon as possible following the construction works in each area, such as the re-dressing of road and track verges and turbine bases (and other areas that may be disturbed as a result of the construction process). Re-seeding / hydro-seeding may be part of reinstatement measures where redressing proves unsuccessful.

Restoration – Restoration works are generally defined as long-term measures aimed to restore (and in some instances improve / enhance) the ecological status of the development with regard to species and / or habitat. Restoration measures are largely covered in the site's Habitat Management Plan (HMP), where applicable. Re-seeding may be part of restoration works where reinstatement works are found to have been unsuccessful with regard to establishing plant growth.

1 INTRODUCTION

1.1 Construction Environmental Management: Aims & Objectives

- 1.1.1 This document provides information relating to Environmental Management for the Drumnahough Wind Farm and associated infrastructure. This document has been prepared to inform the Planning Authority and statutory consultees of the proposed management methods to be employed during the construction of the wind farm.
- 1.1.1 The principal objective of this document is to provide information on the proposed infrastructure and to detail appropriate measures in the avoidance, minimisation and control of adverse environmental impact associated with the wind farm. Furthermore, this document aims to define good practice as well as detailing specific commitments relating to environmental protection as identified in the Environmental Impact Assessment Report (EIAR) (including appendices) and any planning conditions associated with a future planning consent (refer to **Section 2.2**).
- 1.1.2 The Construction Environmental Management Plan (CEMP) forms part of the *Civils Works Contract* (hereafter, the *Contract*). The methods and principles contained herein, as well as within referenced legislative instruments and published guidance documents, will be adhered to by the *Contractor* in developing and refining the detailed design, construction method statements and other plans relating to environmental management as required by the *Contract*.
- 1.1.3 This version of the CEMP presents minimum environmental management requirements to be adhered to by the *Contractor*. This CEMP will be updated following receipt of planning consent to incorporate relevant planning conditions and further details on environmental management measures to be applied during the construction period. 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.
- 1.1.4 The *Contractor* submits all relevant information as detailed in this document to the *Employer* for acceptance in accordance with the contract provisions. No works commence prior to the *Employer's* acceptance. Once approved, the *Employer* provides the *Contractor* with an electronic copy of the final CEMP which the *Contractor* maintains for the duration of the works (i.e. CEMP Version 2.0).
- 1.1.5 This document is read and implemented onsite in conjunction with industry best practice, published guidance documents, and other documents referred to within the CEMP (**Section 16**).
- 1.1.6 A **Checklist** has been included in **Section 17**, providing the *Contractor* with a summary of the minimum information to be provided to the *Employer* pre-, during and post-construction.

2 PROJECT INFORMATION

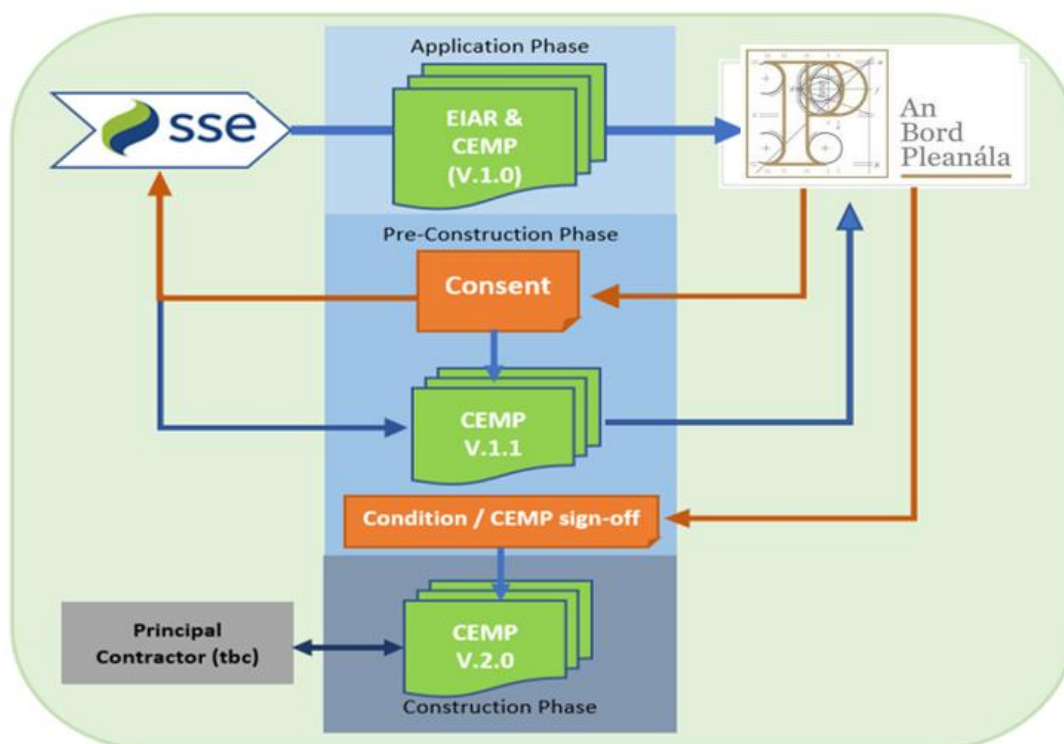
2.1 Scheme Description

2.1.1 The Drumnahough Wind Farm project is a twelve (12) No. turbine wind farm is located in a rural upland area of central Donegal on the southern and western slopes of Cronaglack, Crockalough and Cark, approximately 12.5km south west of Letterkenny and 11km northwest of the twin towns of Ballybofey/Stranorlar.. The project is being proposed by Drumnahough Designated Activity Company(DAC), a co-development between *SSE Renewables Ireland Limited* and *Coillte Cuideachta Ghníomhaíochta Ainmnithe (CGA)*.

2.1.2 Planning permission was previously granted in March 2009 by Donegal County Council (DCC). The current planning application (which this CEMP supports) is seeking permission for turbines up to a maximum turbine tip height of 167.5m. To facilitate a grid connection and export of renewable electricity to the National Electricity Grid (NEG), the project considers two grid connection point options, namely grid connection point A or B. Both grid options will consist primarily of the construction and operation of an underground electrical cable.

2.2 Planning Conditions and Commitments Register

2.2.1 Following receipt of planning consent, if granted, this CEMP will be updated. A draft Commitments Register has been prepared and included in **Appendix A**, detailing the commitments made in the EIAR (based on the Schedule of Mitigation in the EIAR); planning conditions will be included in the register post-consent. Therefore, adherence to the measures described in the CEMP will ensure compliance with the planning consent as far as environmental management is concerned (pre- construction and construction phase). The Commitments Register forms part of the *Contractor's* and *Employer's* compliance checks throughout the project phases. The diagram below illustrates the CEMP preparation process.



3 RESPONSIBILITIES, CORRESPONDENCE & GENERAL COMMUNICATION

3.1 Roles & Responsibilities

- 3.1.1 A project *Contacts Sheet* (**Table 3.1**) provides a list of all *Employer*, *Contractor* and relevant third-party contact details. The *Contractor* updates this sheet and keeps it current for the duration of the *Contract*.
- 3.1.2 A project *Responsibilities Summary Sheet* (**Table 3.2 Appendix C**) details the main tasks and responsibilities as envisaged for the construction phase of the wind farm. The *Contractor* reviews this table as part of the information to be submitted to the *Employer* ahead of construction works and considers its implications / requirements for project communication.
- 3.1.3 The *Contractor* is responsible for obtaining all necessary consents, licences and permissions for all activities as required by current legislation governing the protection of the environment.
- 3.1.4 The *Contractor* considers the mitigation measures and best practice construction methods detailed within this document in his design and in any detailed environmental plans as required by the *Contract*
- 3.1.5 A copy of this CEMP and related files (e.g. Waste Transfer Notes) will be kept in the site offices for the duration of the construction phase and will be made available for review at any time. Upon completion of the construction works, the *Contractor* submits a complete CD copy of the final set of information to the *Employer* for their records. This information will include electronic scans of all relevant hard copy reports, data, field records and correspondence which are generated over the course of the construction phase, including the records highlighted in **Section 3.5** below.
- 3.1.6 Where the *Contractor* has standard documents within his own company / corporate Environmental Management Plan which might cover a particular requirement of this CEMP, these will either be inserted or cross-referenced within the relevant Section of the final CEMP.
- 3.1.7 The *Contractor* ensures that the Environmental Clerk of Works (ECoW) is timeously informed of all site activities, including all programme changes, to ensure advanced checks and monitoring can be arranged. This extends to any preliminary works.
- 3.1.1 To ensure compliance of the works with this document and pollution prevention requirements and Pollution Prevention Plan (PPP, refer to **Section 4.1**), the *Employer* and the ECoW regularly monitor the *Contractor's* works. **Should the Employer or ECoW identify any failure to comply with the requirements of this document or the Contractor's own method statements the Employer or ECoW may stop the associated works (via instruction to the Project Manager) until such time as the failure is rectified.** Any associated cost or time delay incurred will be borne by the *Contractor*.

3.2 Contractor's Environment Manager

3.2.1 The *Contractor* employs an Environmental Manager with appropriate experience and expertise for the duration of the construction phase to ensure that all the environmental design, control and mitigation measures outlined in the CEMP/EIAR and supporting planning documentation in relation to all aspects of the environment are implemented. The Environmental Manager together with an environmental team and in consultation with the ECoW, deals with drainage maintenance, mitigation measures and monitoring. This Environmental Manager will be awarded a level of authority and will be allowed to stop construction activity if there is potential for adverse environmental effects to occur.

3.3 Environmental Clerk of Works (ECoW)

3.3.1 The *Employer* appoints an appropriately qualified and competent environmentalist or ecologist as **Environmental Clerk of Works (ECoW)** to manage and ensure *Contractor* compliance with this CEMP.

3.3.2 The ECoW will have a minimum of 5 years of relevant site experience and will be a full-time role from the start of project contract award for a minimum of 3 months to ensure compliant set-up of site activities. Thereafter the role may be part-time, subject to ongoing compliance of site activities with CEMP (refer to **Section 11** for ECoW responsibilities). For ECoW powers in relation to halting works refer to Section 3.1 above.

3.3.3 Competency of the ECoW, including a minimum of 5 years site experience, is demonstrated via submission of relevant information (e.g. CV, training records, membership records) for acceptance by the *Employer* prior to commencement of construction works.

3.3.4 The ECoW undertakes relevant environmental tasks / training prior to and during the construction works. Where tasks extend into the operational phase, these will be completed either by the ECoW or the *Employer's* operations' environmental staff. Fundamentally, the ECoW shall be responsible for:

- **Monitoring and maintaining temporary drainage systems** in accordance with the CEMP, including the direction of civils works team to implement, bolster and remediate (as necessary) water pollution prevention measures. The *Contractor* provides a drainage maintenance team to undertake essential maintenance and provide a rapid response unit to assist with incidents. Refer to **Section 8** for specific details / tasks.
- **Monitoring implementing habitat and species protection measures** in accordance with the CEMP, including pre-construction verification checks and implementing demarcation measures. Refer to **Section 10** for specific details / tasks.
- **Developing a positive environmental culture** via training and engagement with site management and, importantly, site operatives to increase awareness and promote timeous remediation / reporting.
- **Communicating statutory requirements and good environmental practices** outlined in the CEMP, principally via a schedule of toolbox talks informed by site activities and recorded non-compliance.

3.4 Geotechnical Engineer

3.4.1 The *Contractor* employs a geotechnical engineer for all aspects of slope / peat stability as required by the contract (including this CEMP).

3.5 Correspondence, Records & Reporting

3.5.1 The *Contractor* provides a complete record of all relevant communication and reports associated with all aspects of environmental management and implementation of this document. As a guide, the following records will be maintained:

- *Minutes and attendance record* of start-up meeting (onsite meeting prior to commencement of construction works). Attendance required by *Employer, Contractor, ECoW* and all other relevant personnel responsible for environmental management during the project.
- Weekly rolling **Environmental Risk Log** – this includes the following components:
 - Environmental Risk Log including look ahead activities with required mitigation (including weather forecasts), discussed and recorded at scheduled weekly construction meetings. This will cover all environmental sensitivities, including ecology, archaeology and water quality and Drainage Mitigation locations/measures (specifically itemise silt and sediment control measures implemented across the site and detail their maintenance requirements);
 - **Environmental Risk Map** (refer to **Section 3.6**) supporting the above and illustrating relevant locations.
- *Employers and Contractor Audit Reports* (according to respective corporate procedures).
- Ground risk records (including peat slide risk records/register).
- *Waste Management Records*, as defined in **Section 5**.
- *Water Quality Monitoring Records*, documenting the *Contractor's* visual checks of waterbodies as outlined in **Section 10**.
- *Licenses and Consents* - copies of all permissions, consents, licenses and permits, including related correspondence.
- *General Correspondence* - all other relevant internal and external communication records relating to environmental management issues and implementation of the CEMP.

3.6 Site Induction

3.6.1 The *Contractor* ensures that all contractor employees, sub-contractors, suppliers, and other visitors to the site are made aware of the content of this document that is applicable to them. Accordingly, environmental specific induction training will be prepared and presented to all categories of personnel working and visiting the site.

3.6.2 As a minimum, the following information will be provided to all inductees:

- Identification of specific environmental risks associated with the work to be undertaken onsite by the inductee.
- Summary of the main environmental aspects of concern at the site:
 - i. species and / or habitat protection requirements, e.g. ecological exclusion zones and contact details for the ECoW;
 - ii. archaeological safeguarding measures, e.g. requirements for watching brief and contact details for the project ACoW;

- iii. pollution prevention and protection of the water environment (e.g. silt mitigation measures, refuelling and concrete washout requirements);
 - iv. ground stability and peat slide risk, e.g. areas highlighted as conveying 'moderate' to 'high' peat slide risk and contact details for the project Geotechnical Engineer;
 - v. waste management (including littering); and
 - vi. plant service and repair procedures, specifically service location and the disposal of waste oils and service components.
- Environmental Incident and Emergency Response Plan.
- 3.6.3 The *Contractor* ensures all site staff receive an induction by / on behalf of Coillte regarding working on / near Coillte land.
- 3.6.4 Based on survey data and verification survey data collected throughout the planning and pre-commencement phases, the *Employer* provides an **Environmental Constraints Map (Appendix B)** illustrating land constraints by environmental sensitivities (e.g. exclusion zones). The *Employer* updates the map as required, prior to start of construction, and provides these maps to the *Contractor*.
- 3.6.5 Informed by the *Environmental Constraints Maps*, the *Contractor* provides an **Environmental Risk Map** illustrating environmentally sensitive areas and potential sources of pollution (e.g. water buffers, refuelling areas, location of spill kits, concrete wash out areas, fuel tanks etc.). The *Environmental Risk Map* will be used during the induction and prominently displayed in the compound areas. In consultation with the ECoW, the *Contractor* updates the map as required. In accordance with **Section 3.7**, any update will trigger a toolbox talk to clearly communicate the change and offer opportunity for any necessary clarifications.

3.7 Training and Toolbox Talks

- 3.7.1 During construction, in order to provide on-going reinforcement and awareness training, the above topics, along with any other environmental issues which arise onsite, will be discussed at regular toolbox talks.
- 3.7.2 Toolbox talks and training will be delivered by specialist personnel onsite (e.g. ECoW) as required.
- 3.7.3 The *Contractor* submits a **schedule for toolbox talks** at least one week prior to commencement of works. The proposed schedule – to be considered as a live document - shall be consistent with the programme of works. Additional toolbox talks shall be added as required based on circumstances such as unforeseen risks, repeated observation of bad practices, perceived lack of awareness, pollution event, etc.
- 3.7.4 Specifically, the *Contractor* provides, as a minimum, the following environmental training by competent staff/contractors:
- Training on the use of spill kits (on ground and in surface waters), to be provided on a regular basis (to account for staff/subcontractor changes etc);
 - Training on silt mitigation e.g. installation of silt fencing etc., silt mitigation measures to relevant construction / site staff; and
 - Training on peat slide risk / mitigation measures / monitoring of sight lines etc.

3.7.5 Other toolbox talk topics will include but are not necessarily limited to the following:

- Material handling, including: excavation, segregation, storage and reuse/disposal of excavated materials;
- Groundwater and surface water, including: managing surface water ingress into excavations, dewatering excavations, managing pumped water and identifying and treating contaminated groundwater or surface water;
- Waste management, including waste storage, waste segregation and littering;
- Control of fuel and refuelling, and fuel handling procedures;
- Surface water run-off, drainage control and silt mitigation; and
- Ecologically and archaeologically sensitive areas.

3.7.6 The *Contractor* maintains records of all toolbox talks and training and makes these records available to the *Employer* if requested.

3.8 Environmental Audits

3.8.1 The *Contractor* undertakes a programme of environmental audits, including audits of his sub-contractors, on a quarterly basis and provides an audit report to the *Employer* within 2 weeks of the audit being undertaken.

3.8.2 Environmental audits may be completed at any time by the *Employer*, but at least one per quarter. The *Contractor* maintains a record of all completed audit forms, and records of corrective action and close outs.

3.8.3 The *Contractor* undertakes environmental inspections on a daily and weekly basis (refer to individual Sections) and provides relevant records to the *Employer* when and as requested.

3.9 Risk Assessment and Method Statements

3.9.1 The *Contractor* provides risk assessments and method statements (RAMS) for all works and tasks prior to these being undertaken. These documents take into account and address all of the environmental aspects of the planned works and will include proposed mitigation measures, provided to the ECoW at least one week in advance of such works starting.

3.10 Notice Boards

3.10.1 The *Contractor* provides and maintains project environmental notice board(s) which are positioned to ensure that all operatives have the opportunity to review a notice board on a daily basis. As a minimum this will include one notice board in the site compound.

3.10.2 The environmental notice boards are maintained by the *Contractor* and shall be updated at least monthly. As a minimum, the notice boards contain:

- Description of the key environmental risks and intended risk mitigation measures, together with accompanying Environmental Constraints/Risk Map illustrating the location of the key risks and required exclusion zones / buffer zones and location of emergency response equipment, and
- Key contact numbers and responsible personnel identified within the Environmental Incident and Emergency Response Plan (EIERP, refer to **Section 15**).

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**TABLE 3.1
CONTACTS SHEET**

(Table to be completed by *Employer* and *Contractor* prior to commencement. This table will be updated and kept current by the *Contractor* for the duration of the Contract)

COMPANY	POSITION	NAME	TEL / MOBILE NO.	E-ADDRESS
SSE Renewables	Project Manager	TBC		
SSE Renewables	Construction Manager	TBC		
SSE Renewables	Site Supervisor	TBC		
SSE Renewables	Civil Engineer	TBC		
SSE Renewables	Environmental Manager	TBC		
Archaeology Consultant - tbc	Archaeological Clerk of Works (ACoW)	TBC		
Water Consultant – tbc	Water monitoring staff	TBC		
<i>Contractor – tbc</i>	Project Manager	TBC		
<i>Contractor – tbc</i>	Site Agent	TBC		
<i>Contractor – tbc</i>	Foreman	TBC		
<i>Contractor – tbc</i>	Environmental Clerk of Works	TBC		
<i>Contractor – tbc</i>	Geotechnical Engineer	TBC		
<i>Contractor – tbc</i>	Environment Manager	TBC		
Donegal County Council				
Environmental Protection Agency				
NPWS				
IFI				
Sub-contractors (specify)	TBC	TBC		

4 POLLUTION PREVENTION & MITIGATION

4.1 Responsibility

- 4.1.1 The *Contractor* is responsible for pollution prevention for the duration of the contract and until such time as permanent measures, such as permanent drainage and silt mitigation controls, are deemed to be adequate and appropriately constructed.
- 4.1.2 The *Contractor* ensures that all staff and subcontractors working on site will be familiar with pollution prevention and mitigation measures as detailed in this document. This includes subcontractors, *Employer's* direct contractors and other *Employer's* representatives working on the site.
- 4.1.3 It is the responsibility of the *Contractor* to contact the Environment Protection Agency (EPA) and other statutory and non-statutory bodies e.g. Inland Fisheries Ireland (IFI), and stakeholders in the vicinity of and downstream of the proposed project, so that the requirements and interests of these parties are adhered to and protected throughout the duration of the Contract.
- 4.1.4 Prior to works commencing on site, the *Contractor* prepares a **Pollution Prevention Plan (PPP)** in line with the **below requirements** (as a minimum) and communicates the contents to all staff (induction / toolbox talks). The PPP covers all potentially polluting activities, taking into account best practice standards¹. The *Contractor* provides the PPP to the *Employer* prior to start of works on site.
- 4.1.5 The *Contractor* monitors adherence to the plan throughout the works. The *Contractor* communicates the PPP and any changes/updates of the PPP to all personnel on site.

4.2 General Pollution Prevention and Mitigation Measures

- 4.2.1 The following points (not exhaustive) indicate general pollution prevention measures in accordance with published guidance (**Section 16**) and project commitments. Pollution Prevention measures relating to specific tasks are also detailed in the respective sections of this document.
- 4.2.2 A 50 metre (m) watercourse buffer applies to all infrastructure and associated works, except at watercourse crossing locations. The *Contractor* ensures no work is undertaken within 50m of any watercourses; this includes the storing of materials. The *Contractor* ensures that no plant, materials or tools enter the 50m buffer or the watercourses. Where watercourse crossing works require work within a 50m buffer the specific mitigation measures for such works (refer to **Section 9**) will be observed.
- 4.2.3 Any material or substance which could cause pollution, including fuels / oils, wet cement, raw concrete or silty water will be prevented from entering groundwater, surface water drains or watercourses by the appropriate use of and appropriate placement of (temporary) silt fences, cut-off drains, silt traps and drainage to vegetated areas or areas of low ecological value as determined by the ECoW and where appropriate.
- 4.2.4 Any sign of failing water treatment measures or sight of silted or contaminated water entering any watercourse on site is addressed / mitigated immediately and reported to the *Employer* within 30 minutes. Where pollution of a watercourse occurs, work in this area is halted until the cause of

¹ Refer to Section 16 for relevant documents

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pollution has been addressed and the ECoW has permitted works to re-commence.

- 4.2.5 Vandalism, theft and tipping are common causes of pollution and the project area will be adequately protected by fencing, locked access points and gated security to discourage unauthorised access. Any occurrence of tipping on the site will be reported to the site management who will then inform the local environmental authority and the police if necessary.

4.3 Fuels and Oils

- 4.3.1 The *Contractor* prepares and adheres to a **Fuel Management Plan** in line with the below requirements (as a minimum) and communicates the contents to all staff (induction / toolbox talks).

- 4.3.2 The *Contractor* constructs an impervious hardstand(s), e.g. concrete plinth (flexible liners are not appropriate), to support all bulk fuel store, mobile fuel bowser (when not in use) and any other fuel-powered static equipment housed at the construction compound(s) (e.g. static generator). The hardstand(s) design will direct run-off into a below-ground oil-interceptor. The *Contractor* undertakes refuelling of the mobile bowser on the impervious hardstand. The oil-interceptor will be regularly maintained by the *Contractor*.

- 4.3.3 External fuel delivery vehicles will only be permitted access to the site compound where fuel transfer will be undertaken over an impervious hardstand. The onsite fuel bowser shall be double-skinned (with a bund storage volume of 110%) and only operated by allocated personnel who have been suitably trained in relation to refuelling and emergency response.

- 4.3.4 The Contractor ensures that:

- Fuel containers are stored within a secondary containment system e.g. bund to 110% of volume for static tanks or a drip tray for mobile stores;
- Ancillary equipment such as hoses, pipes are contained within the bund;
- Fuel and oil stores including tanks and drums are regularly inspected for leaks and signs of damage;
- Only designated trained operators are authorised to refuel plant on site;
- Procedures and contingency plans are set up to deal with emergency accidents or spills;

- 4.3.5 All ancillary fuel pipes on plant, outlets at fuel tanks etc. will be regularly checked and maintained to ensure their good state-of-repair and that no drips or leaks to ground occur. The following precautions will also be installed on fuel delivery pipes:

- any flexible pipe, tap or valve must be fitted with a lock where it leaves the container and be locked when not in use.
- Flexible delivery pipes must be fitted with manually operated pumps or a valve at the delivery end that closes automatically when not in use. Any leaking oil from ancillary pipework must be held within secondary containment.
- The pump or valve must have a lock and be locked when not in use.
- Warning notices including “No smoking” and “Close valves when not in use” shall also be displayed.

- 4.3.6 **Spill kits** will be available within each plant on site and also located close to identified pollution sources or sensitive receptors (fuel storage areas, watercourse crossings, etc). Spill kit locations

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shall be communicated to site personnel and included on an *Environmental Risk Map*. The *Contractor* checks contents regularly (i.e. weekly) and where items have been used, or functionality has been compromised, the *Contractor* replaces the contents of spill kits as necessary.

- 4.3.7 Irrespective of the location of refuelling onsite, **interceptor drip trays** (or similar, e.g. plant nappies, – open metal drip trays are not acceptable) shall be available and used during all refuelling operations. Interceptor drip trays will be positioned under any stationary mobile plant to prevent oil contamination of the ground surface or water. Plant and site vehicles are to be well maintained and any vehicles leaking fluids must be repaired or removed from site immediately. Any servicing operations shall take place over drip trays.
- 4.3.8 Areas of waste oil / fuel / chemical storage and permanent refuelling will be located *50m* away from watercourses or drainage paths – location(s) to be included on an Environmental Risk Map.
- 4.3.9 Plant, site vehicles and machinery shall be checked daily and are to be well-maintained. Any machinery leaking fluids must be repaired or removed from site immediately. Any servicing operations shall take place at least *50m* from watercourses (unless servicing is required at the point of breakdown) and over drip trays.
- 4.3.10 Notwithstanding the bulk fuel store etc., which are subject to specific controls (e.g. plinth draining to oil-interceptor), fuel, oils and chemicals will be stored on an impervious base / container within a bund able to contain at least 110% of the volume stored and in accordance with Enterprise Ireland Best Practice Guide “BPG CS005 Oil Storage Guidelines”. Rainwater will not be allowed to accumulate within the bund and in any way compromise the required 110% volume capacity. No tanks or containers may be perforated or dismantled on site.
- 4.3.11 The *Contractor* identifies a specialist clean-up contractor to engage with in the case of a significant pollution event on site. Details of the specialist contractor will be provided to the *Employer* prior to works commencing on site. Details of the specialist contractor will be included in the Environmental Incident and Emergency Response Plan (**Section 15**).

4.4 Concrete

- 4.4.1 Wet concrete is delivered to site from an off-site batching plant. No wet concrete operations take place within or adjacent to watercourses. The *Contractor's* risk assessment and method statement will detail handling and use of concrete on site and associated equipment washing/cleaning.
- 4.4.2 Washing-out of concrete wagons chutes on site is only permitted where the *Contractor* has provided a designated, suitably prepared wash-out area with signage identifying the area as suitable for concrete chute wash-out.
- 4.4.3 Water and cement/concrete in the designated ‘washout’ area disposed of in accordance with the Site Waste Management Plan (untreated washout water is not discharged onto ground or into watercourses / drainage channels).

4.5 Suspended Sediment and Adverse Weather

- 4.5.1 Rainfall and associated surface run-off readily mobilise sediment and silt when draining through areas of construction. The *Contractor* ensures that untreated construction run-off is prevented from flowing into watercourses. The *Contractor*, as part of the track construction works and to reduce run-off, applies high quality, hard wearing crushed aggregate (minimum 150mm layer of hard-wearing Class 6F stone or similar) to the track surfaces, laid to a transverse grade.
- 4.5.2 Any silty water generated on site will be settled out as far as reasonably practicable through

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drainage mitigation measures (silt traps, etc.) and channelled into suitable vegetation (as defined by ECoW) at least 50m from watercourses.

- 4.5.3 **Adverse weather** (rainfall, snowmelt) may result in increased sediment run-off and pollution of watercourses. In order to manage adverse weather conditions, the *Contractor* undertakes the following measures:
- i. The weather forecast² is checked on a daily basis (morning or evening) and forecast is discussed in daily briefings and displayed on notice board.
 - ii. In the case of adverse weather (rain, snow, storm etc) forecast, the *Contractor* and ECoW discuss current and upcoming (48 hours) works. In case of a storm or heavy rain (>25mm/hr) forecast the following steps are undertaken:
 - Review of the Environmental Risk Log (refer to **Section 3.5**) and action any immediate additional drainage mitigation / run-off control as required.
 - Inspecting and securing storage areas and plant as required (depending on the forecast and site-specific risks).
- 4.5.4 The *Contractor* suspends construction activities if -
- these are likely to cause or increase water pollution, where works are likely to overwhelm implemented water pollution prevention and control measures or where a risk of peat slide has been identified.
 - Forecast is for >10 mm/hr (*i.e.* high intensity local rainfall events);
 - Forecast is for >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or,
 - > half monthly average rainfall in any 7 days.

The requirement to temporarily suspend aspects of the *works* can be enforced by the *Contractor*, the ECoW or the *Employer*.

4.6 Noise

- 4.6.1 The *Contractor* applies best practice Code of Practice³ during the construction phase in order to minimise the noise generated by construction activities and nuisance to neighbours.
- 4.6.2 The *Contractor* confirms working hours at the outset of the construction works and agrees any changes in hours with the Local Authority. Typical working hours will be between 7.00am and 7pm Monday to Friday and between 7am and 2pm on Saturdays, with no work carried out on

² **General Forecasts:** Available on a national, regional and county level from the Met Eireann website (www.met.ie/forecasts).

MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days (only provincial scale);

3 hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events;

Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp).

Consultancy Service: Met Eireann provide a 24 hour telephone consultancy service.

³ BS5228 – 1&2, *Code of Practice for the Control of Noise and Vibration on Construction and Open Sites (2009, amended 2014)* will be adopted

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Sundays or public holidays unless essential or in an emergency. The *Contractor* may agree different working hours with the Planning Authority in writing.

- 4.6.3 The *Contractor* ensures plant machinery is turned off when not in use. All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations 1996 (SI 359/1996) and other relevant legislation. **Blasting** will not occur after periods of heavy rainfall. In particular, no blasting will take place for at least 24 hours following a period of rainfall which exceeds 25mm within the previous 24 hours.
- 4.6.4 The *Contractor* undertakes rock blasting in borrow pit areas only if extraction using rippers or hydraulic breakers is deemed impractical. If rock blasting proves necessary, the contractor prepares a detailed blasting design in accordance BS 7385⁴.
- 4.6.5 The *Contractor* does not undertake blasting for turbine locations or track construction unless detailed blasting design and risk assessments in line with BS 7385 have been completed and all risks e.g. slope failure, disturbance of protected species etc. have been taken into account.
- 4.6.6 The *Contractor* prepares a **Rock Blasting Plan**, including detailed blasting design noted above, and provides this to the *Employer* and ECoW for comment, prior to liaison with DCC and National Park and Wildlife Serve (NPWS) and obtaining any relevant permits.
- 4.6.7 All equipment will be maintained in good working order and any associated noise attenuation such as engine casing and exhaust silencers shall remain fitted at all times.

4.7 Dust

- 4.7.1 The *Contractor* undertakes daily visual monitoring for the presence of airborne dust. During prolonged dry spells the *Contractor* undertakes dust suppression on track running surfaces and ensures activities likely to generate dust (e.g. borrow pit operations) are adequately managed to minimise the generation of dust.
- 4.7.2 The *Contractor* ensures an adequate supply of water for dust suppression. Where applicable, the *Contractor* is responsible for following statutory guidance and/or obtaining necessary permissions for the abstraction of water for use in dust suppression. The water supply for dust suppression will be defined by the *Contractor*. The *Contractor* utilises water spraying for dust suppression on site as required⁵. The *Contractor* obtains all necessary permits and licenses as required to abstract water for the purposes of dust suppression on site.
- 4.7.1 The *Contractor* ensures no mud or debris accumulates on the public road and the *Contractor* cleans the public road of any mud, dust or debris by suitable means.
- 4.7.2 To minimise the generation of dust emissions to air, the *Contractor* implements the following measures:
- Completes regular equipment checks, including the inspection of relevant plant and vehicle parts to ensure they are maintained in a good state of repair and are fitted with appropriate dust suppressant measures (e.g. water supply for cutting tools etc.).
 - Imposes, and illustrates via signage, maximum site speed limited of 15mph (or less) for all vehicles.

⁴ to ensure that a peak particle velocity (PPV) of 10 mm/s is not exceeded at a distance of greater than 20m from the blast holes as per BS 7385 Part 2: 1993

⁵ <https://www.hse.gov.uk/copd/casestudies/dustsuppression.htm>

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- In accordance with the reinstatement principals (**Section 7**), earthworks reinstatement progresses in parallel with, or as soon as reasonably practicable following, local construction works.
- Ensures all material (especially fine-powders, e.g. cement) are appropriately contained and stored.
- Installs and utilises a wheel wash, located inside the entrance to the site, to mitigate the effects of mud or dust on the local road network. Any wheel wash water will be recycled if practical and no wheel wash water will be discharged to site/drainage without prior treatment; alternatively, wheel wash water will be removed by a licensed contractor with the appropriate waste collection and disposal permits.
- Installs and utilises dust suppression during borrow pit rock breaking, crushing and blasting activities.
- Covers (with sheets/tarpaulin or similar) loose stockpiled materials which generate dust during dry periods.

4.8 Hazardous Materials

- 4.8.1 The *Contractor* is responsible for ensuring that any hazardous materials (e.g. fuels, oils, paints, chemicals, cement bound granular mixtures etc.) brought to site are accompanied by a Safety Data Sheet⁶.
- 4.8.2 The *Contractor* is responsible for carrying out a risk assessment of each substance and ensuring that all appropriate storage, protective equipment and if necessary, emergency procedures are put in place on site as required by the SDS, the risk assessment and relevant regulations (COSHH Regs, Control of Substances Hazardous to Health).
- 4.8.3 All hazardous materials must be stored in appropriate containers, must be indelibly and legibly labelled to identify the contents, hazards and precautions required.
- 4.8.4 Hazardous materials on site must be stored in a bunded area and in accordance with the relevant Safety Data Sheet and risk assessment, which must be readily available and up to date.
- 4.8.5 Any spent (contaminated) spill kits, absorbent granules, sheets or fibres must be disposed of in accordance with relevant regulations and the Site Waste Management Plan as per section 5 which details the minimum requirements..

4.9 Pollution Monitoring & Controls

- 4.9.1 The *Contractor* carries out regular (at least monthly) inspections of oil/fuel storage areas, plant and machinery, and the PPP. An inspection sheet together with information on inspection frequency and the relevant responsible *Contractor's* representative for undertaking these inspections will be recorded by the *Contractor* and communicated to the *Employer* prior to commencement of the works.
- 4.9.2 Regular onsite meetings will be held to confirm the appropriate use of mitigation measures identified within the *Contractor's* environmental documents relating to pollution control. These meetings will highlight any further issues / measures which may be relevant either prior to commencement or during the works.

⁶ In accordance with REACH Regulation (Regulation (EC) No. 1907/2006)

5 WASTE MANAGEMENT

5.1 Site Waste Management Plan (SWMP) Implementation and Records

- 5.1.1 In accordance with best practice the *Employer* requires a Site Waste Management Plan (SWMP) for all their construction sites.
- 5.1.2 The *Contractor* prepares a SWMP, addressing the following aspects:
- analysis of the waste arisings/material surpluses;
 - specific waste management objectives for the project;
 - methods proposed for prevention, reuse and recycling of wastes;
 - material handling procedures; and
 - proposals for education of workforce and plan dissemination programme
- 5.1.3 The *Contractor* utilises one of the available WMP templates e.g. Smart Waste or WRAP waste management plans⁷, or similar. The SWMP provides details on how waste reduction is to be implemented at the site, and also how this is to be monitored throughout the construction phase. The *Contractor* is responsible for implementation and monitoring of the SWMP.
- 5.1.4 The *Contractor* identifies all waste streams⁸ and provides an estimate of expected waste volumes for each waste type generated within the waste stream.
- 5.1.5 The *Contractor* provides details of their proposed waste contractors (carriers, transfer station, waste recipient etc.) to the *Employer* as part of the SWMP, according to the provisions of the contract.
- 5.1.6 The *Contractor* communicates the requirements of the SWMP to all site operatives during their induction. Furthermore, all operatives on site attend waste reduction toolbox talks to increase awareness of recycling/waste reduction.
- 5.1.7 The *Contractor* provides adequate numbers of separate bins (e.g. for paper, cans/plastic, kitchen waste etc.) and skips / waste containers (e.g. for wood, metal, plastics, hazardous waste, general waste) to facilitate waste segregation and recycling. The *Contractor* uses closed skips (lids) and bins for paper/carboard and general waste.
- 5.1.8 The *Contractor* checks the contents of the site waste and recycling skips on a weekly basis. Non-compliance will be highlighted at the weekly environmental meeting and appropriate actions taken e.g. a toolbox talk to all site operatives.
- 5.1.9 The *Contractor* ensures that litter, materials or waste are not disposed of in the surrounding environment but is instead collected on-site in dedicated waste bins. Otherwise, the *Contractor* undertakes monthly litter collection across the site and reviews effectiveness of toolbox talks.

⁷ Information on WRAP and SMART SWMPs can be found on https://www.ciria.org/CIRIA/Resources/Resource_Efficiency_Knowledgebase/Resources/REK/Resource_Efficiency_Knowledgebase.aspx and <http://www.smartwaste.co.uk/page.jsp?id=97> Information on WRAP and SMART SWMPs can be found on https://www.ciria.org/CIRIA/Resources/Resource_Efficiency_Knowledgebase/Resources/REK/Resource_Efficiency_Knowledgebase.aspx and <http://www.smartwaste.co.uk/page.jsp?id=97>

⁸ For example, food waste, paper, plastics, glass and other typically domestic refuse and sewage, concrete, waste chemicals, fuel and oils, packaging, e.g. paper, plastics and wood, waste metals, polluted water from plant, vehicle and wheel washes.

6 EXCAVATIONS & EXCAVATED MATERIALS

6.1 Contractor Requirements

- 6.1.1 The *Contractor* creates, and maintains, an **Excavation Register**, which is updated weekly and details the location and extent of all open excavations and the current and original location of all stockpiled material. The *Contractor* makes this available to the *Project Manager* upon request.
- 6.1.2 Where excavations are to be backfilled they remain open only for the minimum period necessary to undertake the *works* and at no point remain open for a period longer than one week following completion of the associated elements of the *works*.
- 6.1.3 Construction material for site tracks and hardstanding areas will be primarily sourced from the four on-site borrow pits. The *Contractor* sources additional suitable construction aggregate from local quarries as required.
- 6.1.4 Prior to construction, the *Contractor* prepares a **Peat Management Plan** outlining where excavated peat will be re-used on site (reinstatement of disturbed areas e.g. track verges, reinstatement of borrow pits), utilised for restoration (enhancement areas) or disposed of (in the Material Storage Areas, refer to **Section 7.4**). The Peat Management Plan includes details of peat monitoring (refer to **Section 6.3**). As part of this management plan, excavated peat will not be spread on other intact peatland habitats.
- 6.1.5 **In advance of each main phase of works**, the *Contractor* (in consultation with ECoW, and other specialists where required), provides a **method statement detailing storage and reuse procedures for the excavated materials anticipated from that particular work area**.
- 6.1.6 The *Contractor* pays special attention to the risk of slope instability and peat slides and follows the advice and guidance of the **Geotechnical Engineer**. The *Contractor* ensures that under all conditions, the ground surface stability is fully maintained both during and post-construction.
- 6.1.7 The *Contractor* prepares a location specific temporary works design (including safe side slope angles, installation of drainage around and within the excavation and installation of sediment control measures within the drainage system) for turbine foundations and hardstands of **T8 and T9**, including the track between the two turbines, as these represent the largest scale excavations at Drumnahough.

6.2 Handling and Temporary Storage of Excavated Material

- 6.2.1 Where material is not required for immediate reinstatement or restoration, temporary storage may be required. To minimise handling and haulage distances, the *Contractor* stores excavated material local to the site of excavation and/or local to the end-use site where it is required for re-profiling, landscaping or structural purposes. The *Contractor* agrees temporary storage location(s) with the ECoW prior to commencement of excavations.
- 6.2.2 Where the *Contractor* excavates topsoil, peat vegetation or other organic soil, the **turves (acrotelmic layer) are stored separately** and should be of approximately 500mm in thickness to retain the seedbank and structure, with vegetation facing upward. If required, the *Contractor* waters the turfs to maintain them as suitable for reinstatement and restoration.
- 6.2.3 Stripped materials will be carefully separated and stored in appropriately designed and clearly defined, separate stockpiles. Peat will not be stockpiled at a height greater than 1m and on slopes under 5°, and turf will be stored separately.
- 6.2.4 Temporary storage locations will be appropriately located and designed to minimise impact to

sensitive habitats and species, prevent risks from material instability (particularly in peatland areas) and runoff into watercourses.

- 6.2.5 Stockpiles will be isolated from any surface drains and a minimum of 50m away from watercourses, unless otherwise agreed with the ECoW. Mineral soil stockpiles will be compacted and include appropriate bunding to minimise any pollution risks.
- 6.2.6 Turves must be stored vegetation-side-up and must not be allowed to dry out. The *Contractor* and the ECoW monitor (weekly during dry periods) the condition of stored turves and peat. Where desiccation is evident, as determined by the ECoW, the *Contractor* provides a means of irrigation to ensure the continued viability of the turves and peat.
- 6.2.7 The *Contractor* minimises the time that ground is exposed and excavations are open through careful construction programming.
- 6.2.8 The *Contractor* moves excavated materials unsuitable for re-use or reinstatement on site, or excess material, to one of the designated Material Storage Areas.

6.3 Peat Monitoring

- 6.3.1 The *Contractor* provides details of site-specific monitoring plans as part of the Peat Management Plan. Areas of identified higher peat slide risk or of lower Factor of Safety⁹ adjacent to work zones will be monitored, e.g. by Sightline monitoring.
- 6.3.2 Where stress in the peat is identified the *Contractor* implements emergency procedures to prevent the onset of a bog burst or localised peat slide.
- 6.3.3 Sightline monitoring posts are inspected by the Geotechnical Engineer on a weekly basis.

6.4 Cabling Works

- 6.4.1 Cabling works will be undertaken by a Cabling Contractor. The Cabling Contractor ensures that:
- ◆ Cable installation in trenches is undertaken to avoid creating permeable pathways through the ground by careful backfilling of trenches. Open trenches are drained temporarily, and open times kept to a minimum.
 - ◆ Cable trenches are backfilled with an appropriate material and compacted to a suitable standard; where applicable, clay bunds are constructed within the cable trench at intervals to prevent longitudinal drainage.
 - ◆ Cabling across watercourses is undertaken using recognised construction techniques to minimise disturbance to the watercourses. Methods such as directional drilling, cable ploughing, pipe bridge crossing or temporary damming and excavation and replacement will be considered dependant on watercourse morphology, geology and topography.
 - Excavated peat from the cable route is used to landscape and reinstate the area around the cable trench following backfilling of the trench with approved materials. The angle of the peat reinstated at the top of the infilled trenches will not exceed 5⁰.

⁹ A Peat Stability Risk Assessment Report is included in Volume 3 of the EIAR

7 REINSTATEMENT

- 7.1.1 The *Contractor* undertakes reinstatement of disturbed areas resulting from construction. Reinstatement works are those undertaken during construction and aim to address any damage inflicted on the landscape as part of the construction works.
- 7.1.2 The *Contractor* reuses excavated peat from cut and fill sections of access tracks for dressing the side slopes of track sections, to a sufficient depth of a minimum of 500mm. To prevent silt run off no mineral soil will be used for dressing the side slopes of tracks.
- 7.1.3 The *Contractor* reuses all materials excavated on site as part of reinstatement works, including the reinstatement of borrow pit areas; any materials unsuitable for reinstatement or restoration purposes together with excess material is transferred to the dedicated Material Storage Areas.
- 7.1.4 The *Contractor* profiles slopes on cuttings, embankments and berms/bunds so the slope angles are commensurate with the stability of slope's constituent materials (safe angle of repose, minimum slope angle of 45°). Where practical, the *Contractor* provides a gradual transition with the surrounding / existing ground profile to prevent scour, run off and facilitate vegetation re-establishment.
- 7.1.5 The *Contractor* undertakes reinstatement in parallel with, or as soon as possible following the construction *works* in each area, such as the re-dressing of road and track verges (and other areas that may be disturbed as a result of the construction process).
- 7.1.6 The *Contractor* provides method statements for reinstatement, landscaping and re-profiling of: track verges; construction compounds; other disturbed areas and redundant construction features (such as drainage ditches, settlement ponds not required as part of the permanent drainage arrangement or other sediment control measures, concrete wash out pits and other features which may not be required as part of the permanent works). Reinstatement proposals will provide details on methods proposed for replacement of turves and re-seeding where appropriate. If re-seeding is required, the *Contractor* undertakes this where possible, using native species of local provenance, or if not available using a seed mix approved by the ECoW.
- 7.1.7 Reinstatement of vegetation will be focused on natural regeneration utilising peat or other vegetated turves or soils stripped and stored with their intrinsic seed bank. To encourage stabilisation and early establishment of vegetation cover, where available, peat turves or other topsoil and vegetation turves in keeping with the surrounding vegetation type will be used to provide a dressing for the final surface. Mineral material is not to be used as a top layer but instead turves are reinstated with the vegetated side facing upwards, in order to speed up the re-generation process, prevent scour and associated mobilisation of sediments, to minimise the need for re-seeding, and help maintain the original, native species mix.
- 7.1.8 Where redressing proves unsuccessful the *Contractor* may include re-seeding (including hydro-seeding if necessary) as part of reinstatement measures. Reinstatement is primarily undertaken using in-situ and site-sourced materials (turfs and topsoil). The *Contractor* is responsible for the success of the reinstatement and as such is required to redress/reseed areas post completion, for a period of up to 2 years, where areas have not successfully revegetated by at least 50%. Spraying of vegetation using pesticides (herbicides, fungicides and insecticides) is not permitted.
- 7.1.9 If a seed mix is to be purchased for re-seeding the *Contractor* seeks advice and acceptance from the ECoW. Alternatively, the ECoW provides relevant information on a suitable seed mix to the *Contractor*.

- 7.1.10 The *Contractor*, in liaison and agreement with the *Employer*, considers and implements the reinstatement of clean water cut off (interception) drains and settlement ponds where practical, once all permanent drainage measures are in place.
- 7.1.11 The *Contractor* landscapes the area around the proposed substation compound and building to integrate these into the surrounding area.

7.2 Settlement Ponds

- 7.2.1 The *Contractor*, prior to design and installation of settlement ponds, clarifies and agrees with the *Employer* any requirements for long-term use of settlement ponds as part of any long-term drainage arrangement.
- 7.2.2 Following completion of the construction works (within 6 months of commissioning of the wind farm) or when risk of run-off has sufficiently reduced, the *Contractor* partly fills the settlement ponds with stone (so that they do not present a safety risk when fencing is removed). Runoff from the roads, hard-standings, and other works areas will continue to be directed to these ponds and from there to the outfall weirs. Check dams within the drainage channels will also remain in place.
- 7.2.3 Settlement ponds provided for the borrow pits will remain in place until the pit has satisfactorily vegetated over, unless being retained as a drainage management requirement or has established habitats that may benefit biodiversity

7.3 Borrow Pits

- 7.3.1 The *Contractor* completes the reinstatement of the borrow pits with a vegetated / turf layer in keeping with neighbouring habitats. If reseeded is required, the *Contractor* undertakes this where possible, using native species of local provenance.
- 7.3.2 The *Contractor* maintains comprehensive records of the location, depth and volumes of all materials used in reinstatement of the borrow pits and provides these to the *Employer*.

7.4 Material Storage Areas

- 7.4.1 The *Contractor* / Geotechnical Engineer undertake monitoring and documentation of any indicators of peat slippage on site and drainage run-off.
- 7.4.2 Following completion of the MSAs the *Contractor* provides all design and completion information on the MSA to the *Employer*, including As Built plans and information on stored volumes and type of materials.

8 DRAINAGE DESIGN SPECIFICATION

8.1 Scope and Minimum Requirements

- 8.1.1 The *Contractor* prepares **Drainage Plans** based on the Drainage Plan Drawings submitted as part of the EIAR (to be included in post-consent CEMP).
- 8.1.2 Prior to any construction activity in an area, the *Contractor* inspects the area for areas that may be prone to siltation of nearby watercourses, and where required, installs check dams, sand-bags, silt fences and silt ponds.
- 8.1.3 The *Contractor* includes temporary drainage mitigation structures in the weekly Environmental Risk Log which includes drainage measures and information on ongoing monitoring / maintenance.
- 8.1.4 All implemented mitigation measures will be clearly identified on a plan (e.g. numbered, zoned or other appropriate descriptor) and checked weekly (daily during days with rainfall) to assess the requirement for maintenance.
- 8.1.5 There will be no direct discharge of construction run-off into watercourses, groundwater dependent wetlands or other habitats considered sensitive by the ECoW.

8.2 Clean Water Diversion

- 8.2.1 The *Contractor* keeps green field run-off separate from silty water or other potentially contaminated water. Where appropriate, the *Contractor installs* interceptor ditches and other drainage diversion measures – in advance of any excavation works – to collect and divert green field run-off away from construction disturbed areas. Where clean, greenfield run-off has been collected via interceptor ditches, this water should be returned to watercourses within as short a distance as possible.
- 8.2.2 The *Contractor* keeps the number and extent of greenfield drainage / interceptor ditches to a minimum (i.e. unless required by civil design).
- 8.2.3 Greenfield cut-off ditches will be reinstated wherever possible (civil design permitting) to assist in the maintenance of hydrological connectivity in priority habitats.

8.3 Silt Mitigation and Settlement Ponds

- 8.3.1 Silt-laden run-off will be captured and directed via berms or ditches towards specially constructed sediment control structures.
- 8.3.2 Settlement ponds will be designed and constructed with sufficient capacity to promote settlement and allow contingency for unexpected increased rainfall events. Contingency measures may include additional capacity within an existing pond, tiered systems¹⁰, or identification of additional areas within the vicinity which may be suitable for creation of additional ponds.
- 8.3.3 Siting of settlement ponds will take into consideration access requirements for reinstatement and maintenance (for example: periodic silt removal, expansion of ponds or incorporation of

¹⁰ Three-stage treatment system, Sustainable Drainage Systems (SUDS) manual (Woods *et al*, 2015)

additional silt mitigation measures, etc.). Additional temporary silt mitigation measures may be required during infrastructure maintenance and reinstatement activities.

- 8.3.4 Final discharge from settlement ponds will be directed via diffuse discharge across (non-sensitive) vegetation before joining existing natural rains and watercourses.
- 8.3.5 The *Contractor* discusses and agrees the location of ponds and other drainage mitigation measures with the ECoW prior to associated works taking place. In consultation with the ECoE, the *Contractor* removes any introduced or synthetic material required for temporary erosion or silt mitigation controls, such as silt fencing, synthetic liners, straw bales, sand bags, etc. upon completion of construction works, except where the ECoW deems removal to present a risk to any established habitat.
- 8.3.6 Additional filtration measures may include flow attenuation measures such as weirs, rock bars and / or anchored and embedded straw bales within settling ponds or between series of ponds.
- 8.3.7 The *Contractor* inspects and maintains settlement ponds at regular intervals. Removal of sediment is carried out under low or zero flow conditions so as not to contaminate the clean effluent from the pond. The water level is lowered to a minimum level by pumping without disturbing the settled sediment. The sediment is then be removed by mechanical excavator and transferred to borrow pits (for reinstatement) or Material Storage Areas. For reinstatement of settlement ponds refer to **Section 7**.

Access Tracks

- 8.3.8 The *Contractor* keeps greenfield and treated development run-off separate where possible and channels these separately to suitably vegetated areas (via any required silt attenuation measures) at least 50m from watercourses to allow the settlement of solids onsite.
- 8.3.9 The *Contractor* constructs access tracks with a cross-fall or camber to prevent standing water on the track surface. The *Contractor* maintains the tracks to reduce rutting. Where appropriate and in line with the civils design the *Contractor* provides surface water interceptor grips on steep inclines greater than 10%.
- 8.3.10 The *Contractor* installs cross drains at regular intervals along trackside drainage to prevent build up of surface water on the upslope side of tracks. Cross drains will be installed as road surface grips on a temporary basis if required. The frequency of cross drains should increase in areas where higher flows are anticipated. Requirements for a temporary silt trap at each end of a cross drain will be assessed prior to the works being undertaken.
- 8.3.11 Road grips used for cross drainage will be long enough so that road fill does not extend beyond the end of a grip. Silt fences will be installed immediately above a cross drain inlet and silt traps are required at the inlet points to prevent blockage of the pipe due to silt build up.
- 8.3.12 The *Contractor* provides check dams / water bars (flow barriers or dams constructed across the drainage channel) at regular intervals within drainage ditches, particularly on all slope inclines. Check dams are required to reduce the velocity of water and therefore allow settlement of coarser sediment particles, as well prevent scouring of the drainage channel itself.
- 8.3.13 The number and location of check dams is dependent on the slope gradient, flow velocity and volume of water, the minimum frequency of check dams will generally be such that the top of the downstream check dam is level with the toe of the next check dam upstream.
- 8.3.14 Check dams are constructed using clean, washed and uniformly graded small sized aggregate

held in place by large aggregate with an approximate particle size of between 50mm – 300mm, designed to suit site conditions. Check dams are embedded into the side walls and invert of the drain excavation by at least 100mm.

8.4 Borrow Pits

- 8.4.1 The *Contractor* constructs all necessary drainage prior to commencing excavation of the borrow pit. This incorporates interceptor (cut-off) drains to prevent water ingress to the area of works from the surrounding topography and a toe drain to control water ingress and flow around the base of the excavation.
- 8.4.2 An interceptor ditch will be installed around the borrow pit in order to collect greenfield run-off and prevent it from entering the borrow pit. This will reduce the flow of water onto the exposed rock and soil faces and into the worked floor, thereby reducing the amount of potential development run-off to be treated.
- 8.4.3 Flow attenuation measures (e.g. silt fencing, anchored straw bales, clean stone splays, etc) may be required at the discharge points in order to, aid dispersal of water across a wider area of vegetation and prevent soil erosion.
- 8.4.4 Development run-off will be captured and directed via berms or ditches towards specially constructed sediment control structures. Sediment control structures may comprise a series of settlement ponds with additional incorporated filtration measures where required.
- 8.4.5 In the event that the natural or excavated ground profile does not lend itself easily to capture and diversion of run-off towards settlement ponds, run-off within the borrow pit will be directed towards a sump area prior to being pumped into the ponds.

8.5 Turbine Foundations and Crane Hardstands

- 8.5.1 Foundation excavations for turbines are generally below the level of the surrounding ground and hence surface water ingress or groundwater seepage may occur, leading to standing water within the base of the excavation. Prior to commencement of each foundation excavation, the *Contractor*:
- Assesses the local gradient and the potential risk of silty run-off exiting the base area and designs appropriate sediment control and silt mitigation measures accordingly.
 - Considers information gathered for all soil recorded, especially the potential presence of clay, silt and mixed unconsolidated sediments as these are most likely to generate significant volumes of suspended solids within run off once excavated.
 - Assesses the potential for groundwater ingress and potential mitigation measures, e.g. clean water diversion, pumping into a separate lagoon, additional drainage measures.
 - Where the topography allows, foundation excavations will be dewatered by means of gravity draining. Where this is not possible, a sump will be created from which water can be pumped into an appropriate sediment control structure.

8.6 Construction Compounds, Substation and Control Buildings

- 8.6.1 During construction works, large areas of soil may be exposed at the site of the construction compounds and substation / control building construction footprints. As with tracks and borrow pits, greenfield run-off and development run-off will be kept separate and appropriate silt

mitigation measures will be deployed.

- 8.6.2 As for turbine foundation excavations, the *Contractor* considers the potential for groundwater ingress and measures to deal with such water, including measures to prevent its contamination during the works and a permit to pump procedure.

8.7 Peat and Soil Storage

- 8.7.1 The *Contractor* considers the location of any temporary peat or soil storage areas such that erosion and run-off is limited, leachate from the stored material is controlled and stability of the existing ground, particularly in peatland areas, is not affected.
- 8.7.2 Interceptor ditches, down slope drainage collection systems, containment berms (embedded where appropriate), and appropriate drainage mitigation measures as described above will be required as with other infrastructure described above.
- 8.7.3 The *Contractor* carefully designs **all** peat and soil storage locations, temporary or permanent, and provides method statements including methods for reinstatement works and incorporated drainage elements. Such design will be prepared in consultation with the Geotechnical Engineer, the ECoW and *Employer* prior to works commencing (see also **Section 7.4**).

9 WATERCOURSE CROSSINGS

9.1 General Requirements for Culvert and Bridge Construction

- 9.1.1 The Office of Public Works (OPW) regulate activities in or in the vicinity of rivers, lakes and wetlands, including engineering activities like river crossings and culverting. Depending on the nature of the works, these may require consent from OPW. In addition, consultation with Inland Fisheries Ireland (IFI), the Loughs Agency and the Environment Protection Agency (EPA) will be required. The *Contractor* undertakes all consultation and obtains consents/permits prior to works as necessary.
- 9.1.2 The *Contractor* uses best practice guidelines as listed in **Section 16** where new roads are proposed to cross the watercourses, in particular for culvert design, in-stream works and pollution prevention. For culverts, the *Contractor* uses clear span pre-cast concrete culvert crossings such as a bottomless arch or bottomless box culvert, where possible. The Contractor's design ensures that
- The existing channel profile within the watercourse is maintained;
 - Gradients within the watercourse are not altered;
 - There is unrestricted passage for all size classes of fish by retaining the natural watercourse stream / river bed;
 - There are no blockages within the watercourse. The large size of a clear span culvert allows for the passage of debris in the event of flood flow conditions;
 - The original watercourse velocity is not changed;
 - The clear span of a culvert will ensure that the existing stream / river bank is maintained during construction which will in turn avoid the occurrence of in-stream works; and
 - Dirty / silty run-off from the bridge does not enter the watercourse.
- 9.1.3 The *Contractor* designs and constructs new or upgraded bridges or culverts, including a minimum requirement to allow the unrestricted flow from a 1 in 200 year + climate change storm event.
- 9.1.4 Where clear span culverts are not possible (refer Chapter 3- Civil Engineering), the *Contractor* designs and constructs a headwall at all culvert inlets and outlets, watercourse crossings and under track drainage pipes. Headwalls may comprise stone pitching but are designed and constructed to surround and protect the pipe, leave a flush face at inlets and outlets, channel flows into out from the pipe and prevent scouring. The *Contractor* reduces erosion at either end of a new watercourse crossing by the reduction of flow velocities.
- 9.1.5 Splash boards and run-off diversion measures, including silt fencing adjacent and parallel to watercourses beneath bridges and at culvert crossings, will be used at all crossings to prevent direct siltation of watercourses.
- 9.1.6 The *Contractor* plans all water crossing works to avoid the spawning period between October to May for those waterbodies identified as having suitable spawning habitats.
- 9.1.7 The *Contractor* informs the ECoW at least two weeks ahead of works commencing in or near watercourses and consults the ECoW on any mitigation measures required as part of the works. The ECoW carries out ecological checks /verification surveys immediately prior to construction

or upgrading works in or near watercourses or drainage ditches.

- 9.1.8 The *Contractor* installs temporary run-off and silt mitigation measures prior to watercourse crossing works commencing and provides additional mitigation measures throughout the works as required to prevent pollution of the watercourse (e.g. edge constraints, such as silt fencing to reduce splatter from wheels and vehicles at crossings), until such time as the associated permanent drainage measures and bridge are fully functional.
- 9.1.9 During the construction phase the *Contractor* checks all existing and new crossings for blockages, especially during and after periods of heavy rainfall, but at least weekly.

10 WATER QUALITY MONITORING

10.1 General Requirements

- 10.1.1 In line with best practice, the *Employer* undertakes surface water quality monitoring within the construction catchment prior to (baseline), during and after the construction phase.
- 10.1.2 The surface water monitoring programme is implemented and maintained by the *Employer* and undertaken by an environmental consultant.
- 10.1.3 Monitoring works associated with watercourse water quality monitoring is undertaken in accordance with guidelines in *Biosecurity Protocol for Field Survey Work* (IFI, 2010).
- 10.1.4 Where a decrease in water quality resulting from construction works is observed, the *Contractor* will undertake remedial measures and will bear the costs of all associated sampling and investigation. The *Contractor* may wish to undertake confirmatory sampling and analysis at any point during the works at his own cost.

10.2 Surface Water Quality Monitoring Locations

- 10.2.1 Monitoring of water quality will be carried out on selected watercourses and water bodies. At present and based on the EIAR, monthly monitoring and sampling at five (5) locations are proposed. A final monitoring plan will be developed and presented as part of the final CEMP post- consent.

10.3 Monitoring Frequency and Analytical Parameters

- 10.3.1 Surface water quality monitoring is planned at the following intervals:

Pre-construction (baseline) monitoring:	For six to twelve months prior to start of construction.
During construction:	Monthly, commencing within 2 weeks of start of works, and ad-hoc e.g. following a pollution incident or where the ECoW deems this necessary.
Post construction:	Monthly, for a minimum of six months and maximum of 12 months following completion of construction works.

- 10.3.2 Monitoring of specific locations may cease within 6 months of works ceasing in this area, depending on the monitoring results for that location.
- 10.3.3 The surface water quality monitoring will include the monitoring of field parameters at each location prior to the collection of water samples¹¹ at each location for analysis at an INAB¹¹ accredited laboratory.
- 10.3.4 The field parameters monitored and recorded during each monitoring round and obtained via use of a hand-held monitoring device, are pH, electrical conductivity, temperature, and dissolved

¹¹ Irish National Accreditation Board

oxygen.

10.3.5 Water samples at each location will be obtained and submitted to an INAB accredited laboratory. Generally, it is proposed to undertake analysis for the following parameters:

Table 10.1 PROPOSED LABORATORY ANALYTICAL PARAMETERS	
Analytical test	Rationale
Electrical conductivity	Useful indicator of the overall salinity of surface or spring water
pH	Overall water quality parameter which could indicate effects on water acidity due to changes in land use and disturbance of peatlands.
Temperature	General physical indicator
Dissolved oxygen	Likely to be high in all streams but needs determining as an important indicator of water quality.
Turbidity	Measurable on site, and the most noticeable indicator of impact to a water course
Total suspended solids (TSS)	TSS: measure of water quality for construction developments and hence a TSS limit is generally specified for discharges from construction sites.
Biochemical oxygen demand (BOD)	A measure of the biologically degradable substances in water and a standard surface water quality parameter.
Chemical Oxygen Demand (COD)	Measure of possible releases from disturbed peat turf and peat.
Dissolved organic carbon (DOC)	Key component of carbon cycle and known to be sensitive to development on peatland. Organic carbon can help to reduce metal toxicities. May correlate closely with colour.
Soluble iron	Solubility can be affected by pH. High iron concentrations may precipitate out if physical conditions change.
Ammoniacal Nitrogen	Nutrient, known to occur as pulse after ecosystem disruption.
Total reactive phosphorus (orthophosphate)	Standard nutrient parameter, known to occur as pulse after ecosystem disruption and may lead to eutrophication (algal blooms).
Nitrate	End product of nitrogen pollution. Principal nutrient and standard nutrient parameter. Indicator of background pollution and needed for assessing any impact of ground disturbance during construction.
Chloride as Cl	Indicator of rainfall inputs and site weathering, often related to geology of catchments, partly controls electrical conductivity readings.
Total Petroleum Hydrocarbons (TPH) (CWG by GC-FID)	Monitor impact from potential hydrocarbon releases on site during construction works. Not included in every monitoring round.

10.4 Surface Water Quality Monitoring Reports

- 10.4.1 A monthly monitoring report on the findings of the monitoring exercises will be prepared and provided to the *Employer* and the *Contractor* within 1 week of receipt of analytical results.
- 10.4.2 The pre-construction monitoring results will inform baseline values (average and maximum baseline levels), and the monthly monitoring reports for the period covering the construction and post-construction works will highlight any results exceeding the baseline conditions.

10.5 Contractor's Visual and Field Water Quality Monitoring

- 10.5.1 The *Contractor* ensures that all personnel and visitors on site are encouraged (at site inductions) to report visual indications of changes in water quality (e.g. discolouration or other evidence of contamination) in any watercourses on site.

10.5.2 The *Contractor* undertakes at least weekly (e.g. and following storm/heavy or prolonged periods of rain) visual inspections of the watercourses on site. The *Contractor's* monitoring records will include the following minimum information:

- Antecedent and current weather conditions;
- Current construction activities within the vicinity and in particular up stream or up gradient of the observation point;
- Visual assessment of water colour, turbidity and flow rate;
- Evidence of chemical contamination;
- Visual evidence of silt or sediment pollution within the water column or on the bed of the watercourse/standing water body.
- Details on any communication, corrective action and / or mitigation undertaken as a result of any water quality issues observed during the monitoring visit.

10.5.3 Where evidence of pollution to the water environment is observed, emergency response procedures will be implemented, and the incident will be reported to the *Employer* within 30 minutes (refer to Section 15). The *Contractor* implements remedial measures immediately and records details of actions taken.

10.6 Private Water Supplies (PWS)

Not applicable –there are no known private water supplies in the vicinity of the site.

11 ECOLOGICAL PROTECTION

11.1 General ECoW tasks

- 11.1.1 Within 3 months prior to commencement of the development on site (or in relevant suitable species survey season, prior to commencement of works) pre-construction surveys for protected species and birds will be carried out by the ECoW or suitably qualified ornithologist.
- 11.1.2 During construction the ECoW advises and assists the *Contractor* in avoiding, minimising and mitigating adverse effects on flora, fauna and habitats.
- 11.1.3 Where the ECoW disagrees with works being undertaken by the *Contractor*, resulting in a breach of planning conditions or measures detailed in the EIAR and the CEMP, the ECoW informs the *Employer* immediately. On advice of the ECoW the *Project Manager / Employer* halts the works or parts thereof.
- 11.1.4 The following are anticipated to represent the main tasks which translate these aspects of the role into action. This list is not intended to be exhaustive, and may require modification during the construction period as and when circumstances dictate:
- The ECoW completes regular inspections as agreed with the *Contractor* and the *Employer*, including effectiveness of Pollution Prevention measures and provides advice to the *Contractor*.
 - The ECoW verifies, in advance of works, habitats and species on ground that may be affected by drainage management.
 - The ECoW carries out surveys in advance of any works near or crossing a ditch or watercourse to verify the condition of the watercourse and identify any protected terrestrial and aquatic species, using an established specialist if necessary.
 - The ECoW agrees locations for side casting and temporary storage areas as development proceeds.
 - The ECoW agrees any required seeding specification, including seed mix, in liaison with NPWS, if required.
 - The ECoW informs the *Contractor* and the *Employer's* Project Manager of areas of particular concern and provides advice on any required subsequent actions (e.g. temporary exclusion zones etc.).
 - The ECoW provides biodiversity-related Toolbox Talks as part of the site induction process.
 - The ECoW liaises with the statutory consultees as required and agreed with the *Employer* in line with any Planning Authority requirements (if applicable).
 - The ECoW attends a weekly (or fortnightly, if agreed) environmental meeting to include representatives from the *Employer*, *Contractor*, sub-contractors.
 - The ECoW keeps a record of a) animal sightings and signs including birds, particularly those noted in searches one or two days in advance of construction; b) the habitats of ground to be developed via survey at least a week in advance of construction work; c) tasks carried out and verbal advice given.

- The ECoW assists the *Contractor* with the supply of relevant information for compliance assessment.
- The ECoW provides a weekly or monthly log (to be agreed with *Employer*, template to be provided by the *Employer*).
- The ECoW produces a final report to the *Employer / Contractor* documenting the environmental and ecological effects of the construction period. The evidence for effects will be based on findings included in the minutes of weekly / fortnightly meetings, together with weekly logs and other recording information maintained by the ECoW.
- The ECoW / *Contractor* erects and maintains markers and notices for limits around watercourses, exclusion zones and other areas with protected species or habitats. The *Contractor* assists the ECoW if required by the ECoW, with the installation of markers and notices.
- The ECoW conducts checks for protected species and sensitive habitat (peatland, watercourses) within and adjacent to construction areas, and maintains a register of all habitat inspections carried out.
- The ECoW implements species protection plans, if ground checks suggest this is necessary for the protected species and habitats.

11.2 General Ecological Protection and Mitigation Measures

- 11.2.1 The *Contractor* restricts vehicle access to tracked areas, hardstanding and the immediate vicinity around the turbine sites.
- 11.2.2 The *Contractor* prevents entry of vehicles into any demarcated areas (sensitive ecological areas) and utilises low pressure tracked equipment on deep peat to avoid peat failure/slips.
- 11.2.3 The *Contractor* limits site clearance works to those areas required as per the infrastructure design and Works Information.

11.3 Habitat Protection Plans

General measures for both aquatic and terrestrial habitat protection are as follows:

- 11.3.1 As part of the pre-works protected species checks the ECoW also checks for invasive plants. The ECoW records and communicates the presence of any invasive species to the *Contractor*.
- 11.3.2 The *Contractor* maintains a 50m buffer between working areas, machinery and watercourses and open drains connected to watercourses in all areas except at watercourse/open drain crossing points (any buffer zones less than 50m have to be authorised by the ECoW). Buffer zones will be demarcated by the *Contractor* as and where advised by the ECoW. The *Contractor* will discuss and agree the requirement for demarcation with the ECoW and the *Employer* prior to commencement of any works.
- 11.3.3 The *Contractor* installs and maintains pollution prevention measures in accordance with this CEMP;
- 11.3.4 Any forestry felling works, in particular in the vicinity of watercourses will adhere to general good practice measures as outlined in **Section 13**.
- 11.3.5 The *Contractor* ensures that prior to plant being brought to site all plant and equipment is cleaned and free of soil / mud / debris or any attached plant or animal material. In addition, prior to

entering the site, the *Contractor* visually inspects all plant/equipment to ensure all adherent material and debris has been removed.

- 11.3.6 The *Contractor* ensures areas of invasive species are appropriately demarcated and prepares an **Invasive Species Management Plan** detailing how the spread of such species by the works is prevented. In preparing the Invasive Species Management Plan the *Contractor* seeks specialist advice. The *Contractor* follows the guidelines to avoid the spread of invasive alien species as issued by the National Roads Authority – The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (NRA, 2010).
- 11.3.7 The *Contractor* **restricts all construction activities** to the consented development infrastructure footprint. Areas within the site boundary but outwith the wind farm infrastructure footprint are only accessed if the ECoW has signed this off.
- 11.3.8 The *Contractor* uses bog mats on bog habitats when it is appropriate. The use of bog mats will help minimise damage to the bog habitat by construction activities, especially the movement / presence of machinery.

11.4 Species Protection Plans

Bats

- 11.4.1 Prior to felling of any trees the *Contractor* ensures inspections by the ECoW have been completed (if felling of trees with bat roosting potential i.e. mature trees with voids, cracks, loose bark and/or ivy cover is required, a bat survey will be required by a suitably qualified bat ecologist prior to felling) and any licences obtained from NPWS as required.

Birds

- 11.4.2 All bird species are protected by law. All breeding birds encountered during the works are protected.
- 11.4.3 The *Contractor should* undertake any vegetation removal (including hedges and trees) outwith the bird breeding season (March to August inclusive) unless agreement is obtained from the National Parks and Wildlife Service (NPWS).
- 11.4.4 If construction commences before the end of the breeding season the *Contractor* employs a suitably qualified ecologist / ECoW to undertake those checks required e.g. for species such as crossbills¹² in forested areas, prior to works taking place. If works do not begin until the end of the bird breeding season, the *Contractor* provides bird deterrence measures prior to the start of the next breeding season as advised by the ECoW.
- 11.4.5 If construction works take place during the main bird breeding season (March to August inclusive), in order to ensure compliance with the legislation, suitable nesting habitat will be checked for nests by a suitably qualified ecologist / ECoW prior to works taking place.
- 11.4.6 Where active nests / breeding birds are identified the ECoW establishes an appropriate buffer zone, if necessary in consultation with the National Park and Wildlife Service (NPWS). No works will take place in these areas until the ECoW permits this.

¹² Crossbills almost always breeds and feeds in coniferous woodland, mainly Scots Pine and Larch. Crossbills are one of the first birds to start breeding in the year (February/March).

Merlin

11.4.7 The ECoW (or suitably qualified ornithologist as required) monitors the site for presence of Merlin from late February to late September. Should Merlin be present, the ECoW applies relevant buffer zones and restricts works as required (e.g. no works within a 350m buffer zone).

11.4.8 If a merlin nest is detected within the wind farm site, the ECoW undertakes the following measures:

- Liaison with ornithologist / merlin specialist, if required (i.e. if ECoW requires specialist support);
- Determination of the applicable appropriate buffer distance and application of buffer zone / demarcation;
- Notification of NPWS

Fish

11.4.9 Refer to **Section 9**.

Mammals – Otters and Badgers

11.4.10 Surveys undertaken in 2019 recorded no otter holts. Surveys were undertaken in 2019 and no badger setts were recorded within the development site. The ECoW / ecologist undertakes a walkover of the site prior to construction in order to verify the mammals and birds in any areas earmarked for habitat removal. This walkover will be undertaken by a suitably qualified expert at an appropriate time of year.

11.4.11 The *Contractor* informs the ECoW at least two weeks ahead of works commencing in or near watercourses and consults the ECoW on any mitigation measures required as part of the works.

11.4.12 Prior to works commencing, the ECoW marks buffers around all known otter shelters using a marking method and distance in accordance with relevant guidance¹³ or in consultation with NPWS.

11.4.13 The *Contractor* does not commence construction activities and blasting within 100m from a watercourse used by otters until two hours after sunrise, ceasing two hours before sunset; machinery lights will be directed away from watercourses. Sunrise and sunset time can be obtained from the internet (www.timeanddate.com), but will otherwise be advised by the ECoW;

11.4.14 The *Contractor* ensures that

- all open excavations are ramped to enable easy exit by otter and other species;
- culvert pipes stored on site are capped, or if caps are not available, pipes are stored vertically, to prevent otter entrapment;
- design of any permanent or temporary lighting is such that it is directed away from watercourses and that an unlit corridor of 30m either side of watercourses is maintained.

¹³ Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes.

11.4.15 During the construction period, the ECoW carries out further checks, including checks ahead of the construction front to identify signs of otter or badger activity.

11.4.16 The ECoW maintains a mapped record of checked areas and a log of otter surveys and informs the *Contractor* and *Employer* as soon as possible of any potential restrictions and limitations to the planned works as a result of the checks/survey findings.

11.4.17 Should any badger setts or other protected species be discovered within the site during construction works, the ECoW informs the NPWS and puts in place appropriate measures in accordance with advice and relevant licence from the NPWS.

11.4.18 All site personnel report any sightings of otters and any potential otter shelters encountered on site to the ECoW as soon as possible.

Reptiles and Amphibians

11.4.19 The ECoW / ecologist undertakes lizard and amphibian surveys in advance of construction works. These surveys will focus on breeding areas potentially used by amphibians and resting places of lizards.

12 ARCHAEOLOGICAL PROTECTION

12.1.1 The *Employer* appoints a suitably qualified **Archaeological Clerk of Works (ACoW)** to carry out an archaeological assessment of the site prior to site works commencing.

Pre-Construction Mitigation Measures

12.1.2 Regarding the three upland Malt Settlement Sites the ACoW:

- archaeologically records and surveys the sites including plans and elevations;
- establishes a 20m buffer zone around them in advance of construction to avoid any accidental damage during construction;
- Prepares and submits a report on the results to the planning department of Donegal County Council and the National Monuments Service on completion.

12.1.3 The ACoW reviews the EIAR information and advises the Employer as to whether pre-construction trial trenches should be carried out anywhere in relation to the planned infrastructure footprint (i.e. likelihood of presence of archaeological finds and avoidance of construction programme delay);

12.1.4 The ACoW devises a strategy and undertakes any licensed archaeological test excavations in advance of construction at targeted areas as agreed with the Employer and Donegal County Council (or as required by the Consent).

12.1.5 Prior to any construction works taking place on site the ACoW provides the *Contractor* with a plan identifying archaeological 'no-go' areas (demarcated on site), areas where archaeological supervision is required, and areas of no concern. The *Contractor* updates the Environmental Risk Map accordingly.

Contractor's Mitigation Measures / Construction Period

12.1.6 Prior to intrusive works taking place in an area the *Contractor* ensures that the ACoW has either approved of such works to take place in his/her absence or that the ACoW is present during ground works (watching brief).

12.1.7 The *Contractor* ensures no site preparation works, demolition, or other groundwork are carried out without prior consultation with the ACoW.

12.1.8 The *Contractor* ensures no plant or staff access demarcated areas and adhere to the ACoW's instructions and advice at all times.

13 FORESTRY WORKS

- 13.1.1 Prior to any felling works, the Forestry Contractor ensures that a valid felling licence is in place.
- 13.1.2 The Forestry Contractor employs qualified and competent staff and subcontractors (if applicable).
- 13.1.3 The Forestry Contractor agrees all access and egress points for the works with the *Employer*.
- 13.1.4 The Forestry Contractor ensures that traffic management has been agreed and is in place prior to start of the forestry works.
- 13.1.5 Where possible, the Forestry Contractor allows for linear connections between remaining forest blocks (for habitat connectivity).
- 13.1.6 The Forestry Contractor ensures all works are undertaken using best working practices (refer to **Section 16**, including e.g. minimising the risk of wind-throw by lopping trees at 5 – 8 m, control of run-off via sediment traps, attenuation / settlement ponds etc).
- 13.1.7 The Forestry Contractor **consults with the *Employer* and the ECoW to ensure that any protected species and/or sensitive habitats have been considered prior to commencement of the works**, and appropriate mitigation measures have been agreed and implemented, as detailed in **Section 11**.
- 13.1.8 The Forestry Contractor ensures that felling of mature trees that may provide suitable roosting opportunities for bats will be limited to periods September to November or April to May as per NRA guidance (refer to **Section 16**) and is undertaken in accordance with advice provided by a suitably qualified ecologist / ECoW. Felling of such trees out with these periods is only undertaken if the ecologist has provided advice accordingly.
- 13.1.9 The Forestry Contractor and his subcontractors comply with the Pollution Prevention and the Environmental Incident and Emergency Response measures as detailed in the CEMP.
- 13.1.10 When operating within 50m of a watercourse the Forestry Contractor ensures best practice is applied to prevent contamination of watercourses or damage to watercourse habitats. The Contractor complies with relevant Forestry Guidance and legal requirements.
- 13.1.11 The Forestry Contractor provides spill kits and drip tanks for the works and ensures all forestry machines carry spill kit.
- 13.1.12 The Forestry Contractor ensures all plant is regularly checked for fuel and oil leaks, at least once a day. All spills and leaks are reported to the Employer within 30 minutes of occurring.
- 13.1.13 The Forestry Contractor ensures re-fuelling activities will comply with the Pollution Prevention and the Environmental Incident and Emergency Response measures.
- 13.1.14 The Forestry Contractor removes any brash from pre-construction tree-felling from the riparian buffer zones to 30m either side of the watercourse to mitigate against nutrient losses.
- 13.1.15 The Forestry Contractor carries out tree felling in advance of the excavation for site access tracks and hard-standing areas. The corridor for tree felling on access tracks will be approximately 18m wide. This will provide clear access for the preparation of preliminary drainage works at this stage, which will facilitate access track and turbine construction later. Trees will be felled away from aquatic zones where possible.

13.1.16 The Forestry Contractor uses brash mats as necessary on any off-road harvesting routes.

Branches, logs or debris will not be allowed to accumulate in aquatic zones and will be removed as soon as possible, especially for those watercourses crossed by proposed cables which are adjacent to forestry.

13.1.17 Prior to keyhole tree felling, the Forestry Contractor blocks any existing forestry drains from keyhole felling areas to watercourses and installs appropriate mitigation measures.

14 ENVIRONMENTAL INCIDENT & EMERGENCY RESPONSE

14.1 General Requirements

14.1.1 The *Contractor* prepares a detailed **Environmental Incident and Emergency Response Plan (EIERP)**. The EIERP contains details of emergency scenarios and relevant procedures and actions that will apply.

14.1.2 The *Contractor* communicates the EIERP as part of the site induction to all staff and visitors.

14.1.3 The Contractor ensures the EIERP contains contact details of relevant staff and external authorities, e.g.

- Environmental Protection Agency (EPA) and EPA 24-hour emergency incident line 1890 33 55 99
- Inland Fisheries Ireland (IFI) and IFI 24-hour pollution line 1890 34 74 24
- Loughs Agency (Foyle Area) +44 (0) 28 71 342100
- Specialist clean-up contractor
- Emergency Services
- Local Authority Environmental Officers
- An Garda Síochána
- National Parks and Wildlife Services

14.2 SEARS and Environmental Auditing

14.2.1 The *Contractor* completes a SSE Safety and Environmental Awareness Report (SEAR) for all potential (near miss) or actual environmental incident or emergency which occurs on site.

14.3 Summary Sheet for Machinery / Plant Operators

14.3.1 The *Contractor* provides a 1-page Summary Sheet containing the key information for incidents response to be used as a quick reference for any on-site personnel witnessing an incident. A laminate copy of this Summary Sheet will be located with all plant / machinery / on-site vehicles. Key Information to be provided to the **Project Manager and the ECoW within 30 minutes** of an incident (irrespective of the scale / severity of the incident):

- E.g. What substance was spilled (Material Data Safety Sheet);
- Approximate volume and time of spillage;
- Accurate Location of spill (GPS/grid reference or ID/number referenced on map etc.);
- All measures taken;
- Help required i.e. manpower, machinery, expert advice, disposal, etc. and,
- Whether the spill has reached a watercourse.

15 REFERENCE DOCUMENTATION

CIRIA (2000), Sustainable Urban Drainage Systems Design Manual for Scotland and Northern Ireland

CIRIA (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532)

CIRIA (2004) Interim Code of Practice for Sustainable Urban Drainage Techniques

CIRIA (2005) "Environmental good practice on site" 145

CIRIA (2006) Control of water pollution from linear construction projects. Technical guidance (C648)

COFORD, 2004, Forest Road Manual, Guidelines for the design, construction and management of forest roads

Department of Agriculture, Food and the Marine, Standards for Felling and Reforestation (Oct 2019)

Department of the Marine and Natural Resources (1998), Fisheries Guidelines for Local Authority Works. Department of the Marine and Natural Resources, Dublin

Department of Environment Heritage and Local Government (2006), Wind Farm Planning Guidelines

Department of Housing, Local Government and Heritage, Draft Revised Wind Energy Development Guidelines (2019)

Department of Marine and Natural Resources (DMNR) (1998), Fisheries Guidelines for Local Authority Works. Department of Marine and Natural Resources, Dublin

Eastern Regional Fisheries Board. (Year Unknown). Fisheries Protection Guidelines. Eastern Regional Fisheries Board, Dublin

Enterprise Ireland, Best Practice Guide BPGCS005 Oil Storage Guidelines

Environment Protection Agency (EPA), <http://www.epa.ie/pubs/advice/>

Forest Service and Department of Agriculture, Fisheries and Food, 2000a, Forest Harvesting and the Environment Guidelines.

Forest Service and Department of Agriculture, Fisheries and Food, 2000b, Forest and Water Quality Guidelines

Forestry Civil Engineering and Scottish Natural Heritage, 2010, Floating Roads on Peat

Forestry Commission Scotland, 2004, Forests and Water Guidelines 4th Edition

Forests and Water, 2011, UK Forestry Standard Guidelines

Forestry and Water Quality Guidelines (Forest Service, Department of the Marine and Natural Resources, July 2000);

Forest Harvesting and Environmental Guidelines (Forest Service, Department of the Marine and Natural Resources, July 2000).

Inland Fisheries Ireland (2016) Guidance on Protection of Fisheries during Construction in and adjacent to Water

Irish Wind Energy Association and Sustainable Energy Ireland (2008), Best Practice Guidelines for the Irish Wind Energy Industry

MacCulloch 'Guidelines for the risk management of peat slips on the construction of low volume/low cost roads over peat' (2006)

National Roads Authority (2004), Guidelines for the treatment of badgers prior to the construction of national road schemes, NRA, Dublin

National Roads Authority, (2008), Guidelines for the crossing of watercourses, during the construction of national road schemes

National Roads Authority (2010) – The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads

Office of Public Works "Construction, Replacement or Alteration of Bridges and Culverts, 2013".

UK Pollution Prevention Guidelines (PPG):

- GPP 2 (2018): Above ground oil storage tanks
- GPP 4 (2017): Treatment and disposal of wastewater where there is no connection to the public foul sewer
- GPP 5 (2017): Works and maintenance in or near water
- PPG6 (2012): Working at construction and demolition sites
- *GPP08 (2017): Safe Storage and Disposal of Used Oils;*
- GPP 21 (2017): Pollution incident response planning
- PPG 22 (2011): Incident response - dealing with spills
- PPG 26 (2011) Safe storage - drums and intermediate bulk containers

16 CHECKLIST – Required *Contractor’s* Information

The information listed in the table below will be provided by the *Contractor* to the *Employer* according to the provisions of the contract, as indicated.

To be updated post-consent in accordance with planning permission

Documents / Information (and updates thereof) required	pre-start of works	during and post construction
Consents, licences and permissions for activities as required by current legislation governing the protection of the environment	Yes	Yes
Completed / Updated Contacts Sheet	Yes	Updates
Pollution Prevention Plan	Yes	Updates
Fuel Management Plan	Yes	Updates
Rock Blasting Plan	Yes	Updates
Drainage Maintenance Register		Yes
Weekly Environmental Risk Log		Yes
Geotechnical / Peat Risk Register		Yes
Environmental Risk Map	Yes	Updates
Toolbox Talk Schedule	Yes	Updates
Environmental Inspection Schedule	Yes	Updates
SHE risk register, Risk Assessment & Method Statements	Yes	Yes
Site Waste Management Plan and related information	Yes	Yes
Peat Disposal Plan	Yes	Updates
Excavation / Reinstatement records and plans		Yes
Inspection and Audit Reports		Yes
Design / Method Statements for Peat Storage	Yes	Updates
Water monitoring records		Yes
Watercourse Crossing Plan	Yes	Updates
Invasive Species Management Plan	Yes	Updates
Felling Licence	Yes	
Environmental Incident and Emergency Response Plan	Yes	Updates

Note: The above list only relates to requirements of this CEMP and is not exhaustive. As part of the Contract, other information provisions will also be required from the *Contractor*.

Appendix A – Draft Commitments Register

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Environmental Planning Conditions & Commitments (Sheet 2)							
Planning Condition (PC) Number; or EIA Chapter / EIA Appendix Commitment	Topic	Commitment	Related Planning Condition (PC)	Related existing (draft) Document	To be Covered in Construction Document	Project Phase	Responsible Party
Chapter 2 Description of Proposed Project; Chapter 17 Schedule of Mitigation; EIA Appendix	Construction Environmental Management Plan (CEMP)	A Construction Environmental Management Plan has been prepared for the project and will be implemented during construction in order to ensure that the project is constructed in accordance with best practice, with the minimum impact on the surrounding environment. The implementation of proposed mitigation measures, environmental commitments of the project and the monitoring and supervision of these measures will be managed through the CEMP. It includes measures to control/manage the following: Noise and Dust Emissions; Protection of Water Quality/Sediment and Erosion Control; Fuel and Oils Management; Management of Concrete; Ecological Management (Protection of Habitats and Fauna); Invasive Species Management; Management of Archaeology; Waste Management; Emergency Response; Site Environmental Training and Awareness; Monitoring and Auditing; Managing Environmental Incidents and Complaints.		CEMP	CEMP	Pre-construction Construction	Employer / Contractor
Chapter 2 Description of Proposed Project; Chapter 17 Schedule of Mitigation; EIA Appendix	Construction Environmental Management Plan (CEMP)	A final CEMP will be prepared by the appointed main construction contractor in advance of works commencing and will be submitted to the local authority(s) for approval. Construction method statements will be prepared prior to commencement of construction and incorporated into the CEMP.		CEMP	CEMP	Pre-construction Construction	Employer / Contractor
Chapter 2 Description of Proposed Project Chapter 12 Landscape and Visual	Residential Amenity/Landscape & Visual Impact	Turbines are to be off-white or grey in colour to correspond with the colour scheme of existing turbines, and will have a matt, non-reflective finish.			turbine spec / contract	Pre-construction Construction	Employer
Chapter 2 Description of Proposed Development	Best Practice	Best construction practice, including that for Health and Safety, will be employed to minimise the risk of any accidents occurring. All work on site will be carried out in compliance with the Health and Safety Act 2005, the Health and Safety (Construction) Regulations 2013 and all relevant Legislation and Work Practice to ensure that the construction areas, site environs and public roads remain safe for all users.			Safety and Health Plan	Pre-construction Construction	Contractor
Chapter 2 Description of Proposed Project Chapter 10 Water	Protection of Water Quality – Management of Domestic Effluent	During the operational phase, sanitary waste from the substation toilet facilities will be collected in a wastewater holding tank. This will be maintained by the service contractor on a regular basis				Operations	Operations Manager
Chapter 2 Description of the Proposed Project	Removal of Wind Farm Components and Site Reinstatement	Prior to commencement of any decommissioning work the following will be provided to Donegal County Council for approval: oA plan outlining measures to ensure the safety of the public workforce and the use of best available techniques at the time oA comprehensive reinstatement proposal, including the implementation of a program that details the removal of all structures and landscaping. Removal of infrastructure will be undertaken in line with landowner and regulatory requirements and best practice applicable at the time. Decommissioning tasks based on current requirements and best practice include: •Decommissioning will comprise the removal of the turbines and reinstatement of the site. Cranes of similar size to those used for construction will disassemble each turbine before the towers, blades and all components are removed and hardstanding areas reinstated. •Wastes generated during the decommissioning phase will be taken off site, and disposed of at an authorised waste facility. Any structural materials suitable for recycling will be disposed of in an appropriate manner •At present it is anticipated that the underground cables connecting the turbines to the selected substation will be cut back and left underground. They will not be removed if an environmental assessment of the decommissioning operation demonstrates that this would do more harm than leaving them in situ. The assessment will be carried out nearer the time to factor in the environmental changes over the life of the project. •Hardstand and turbine foundation areas will be remediated to match the existing landscape. Access roads will be left for use by the landowners. The current view is that the disturbance associated with the removal and disposal of the elements would be more damaging than leaving them in place.				Decommissioning	Operations Manager
Chapter 5 Population & Human Health; Chapter 17 Schedule of Mitigation	Safety and Health Plan	A Safety and Health Plan covering all aspects of the construction process will be prepared in advance of construction and will comprehensively deal with safety and health related issues.			Safety and Health Plan	Pre-construction / Construction	Contractor
Chapters 5 - 15; Chapter 17 Schedule of Mitigation	Best Practice	Environmental Manager An Environmental Manager with appropriate experience and expertise will be employed for the duration of the construction phase to ensure that all the environmental mitigation measures are implemented. This manager will be awarded a level of authority and will be allowed to stop construction activity if there is potential for adverse environmental effects other than those predicted in the EIA.		CEMP	CEMP	Pre-construction / Construction	Contractor

Environmental Planning Conditions & Commitments (Sheet 2)							
Planning Condition (PC) Number; or EIA Chapter / EIA Appendix Commitment	Topic	Commitment	Related Planning Condition (PC)	Related existing (draft) Document	To be Covered in Construction Document	Project Phase	Responsible Party
Chapters 5 - 15; Chapter 17 Schedule of Mitigation	Best Practice	Ecological Clerk of Works (ECoW) A suitably qualified and experienced Ecologist will be employed during the construction phase of the project. Duties will include the review of all method statements, delivery of toolbox talks and monitoring of construction phase to ensure all environmental controls and EIA mitigation are implemented in full. The Ecologist will be awarded a level of authority and will be allowed to stop construction activity if there is potential for adverse environmental effects other than those predicted and mitigated in the EIA		CEMP	CEMP	Pre-construction Construction	Employer / Contractor
Chapter 6 Biodiversity; Chapter 10 Water; Appendix B-2 CEMP; Chapter 17 Schedule of Mitigation	Protection of Water Quality – Best Practice	All works in proximity to watercourses shall follow the generic best practice guidance outlined in the following documents: Forestry and Water Quality Guidelines (DMNR, 2000); and Guidelines on Protection of Fisheries during Construction Works in and adjacent to Waters (IFI, 2016).		CEMP	CEMP	Construction	Contractor
Chapter 6 Biodiversity; Chapter 10 Water; Appendix B-2 CEMP; Chapter 17 Schedule of Mitigation	Protection of Water Quality – Best Practice	Baseline water quality monitoring prior to commencement of works will be carried out at selected sites on watercourses draining the proposed development.		CEMP	CEMP	Pre-construction	Employer
Chapter 6 Biodiversity Chapter 10 Water Chapter 3 Civil Engineering Appendix B-2 CEMP; Chapter 17 Schedule of Mitigation	Protection of Water Quality – Design Measures	<ul style="list-style-type: none"> •Prior to any construction activity, the site will be inspected for areas that may be prone to siltation of nearby watercourses, and where required, check dams, sand-bags, silt fences and silt ponds will be installed in adjacent roadside drainage ditches and where new development components are proposed (e.g. access tracks, trenching, hardstands, sub-stations and borrow pits). •Brash from pre-construction tree-felling will be removed from the riparian buffer zones to 30m either side of the watercourse to mitigate against nutrient losses. •A Sediment and Erosion Plan will be prepared and agreed prior to the construction phase of the wind farm and will form part of the CEMP. •A robust drainage system, integrally designed with the wind farm layout, will largely mimic the existing drainage regime across the site without deteriorating water quality and will safeguard the quality of catchment water from wind farm-related sediment run-off. Prior to excavation, drains should be established to effectively intercept overland flow prior to earthworks. •Prior to construction, existing overland flows of clean water in the upstream catchment area will be intercepted and conveyed to the downstream side of the works areas in order to limit the extent of surface water coming into contact with the works. The clean water conveyed will be discharged via a level spreader down slope of the works over existing vegetation. •All clean water interceptor drains or earth mounds will be positioned upslope to prevent any mixing of the clean and dirty water. •To prevent erosion of the ground surface and to attenuate the flow rate to the downstream receiving waters, each clean water drain will discharge water through either perforated pipes or through a discharge channel functioning as a weir. •In order to provide for the efficient removal of suspended solids from site run-off during construction, a dedicated three-stage tiered-system of settlement ponds will be put in place prior to the construction of access tracks and the excavation for turbines. •A series of open drains will be constructed throughout the site to direct all on-site run-off to settlement ponds. Check dams will be placed at regular intervals, based on gradient, along all drains to provide flow attenuation, slow down runoff, to promote settlement and to reduce scour and ditch erosion. •There will be a minimum buffer width of 20m between the overflow weir of settlement ponds and the downstream watercourses to buffer the larger volumes of run-off during periods of high precipitation and further reducing suspended sediment load to surface watercourses. •Existing rills and drains within the dispersion zone will be blocked off where necessary to prevent concentration of the flow. •Silt traps will be provided at regular intervals in the existing drains along the existing forest tracks to mitigate any increase in suspended solids in the surface water run-off. •Where tracks have a gradient greater than 2%, check dams will be installed in the drains to reduce flow velocity and potential erosion while also allowing for settlement of sediment. •The side slopes in the cuttings for the construction of access tracks will be at a slope of no less than 1:3. This will serve sufficient to reduce any potential erosion of the side slopes in the access track cuttings. 		CEMP	CEMP	Construction	Contractor
Chapter 6 Biodiversity Chapter 10 Water Appendix B-2 CEMP;	Protection of Water Quality - Water Crossings	All works shall follow best practice guidance outlined in the following document: •Guidelines for the crossing of Watercourses during Construction of National Road Schemes (NRA, 2008)		CEMP	CEMP	Construction	Contractor
Chapter 6 Biodiversity Appendix B-2 CEMP		Should a newly established holt be identified within the works area before the commencement of construction, additional surveys/enabling works will only be undertaken under the appropriate NPWS licence.		CEMP	CEMP	Construction	Contractor / ECoW
Chapter 6 Biodiversity Appendix B-2 CEMP	Biodiversity – Invasive Species	A pre-construction survey for invasive species will be conducted. Should invasive species be recorded at works locations on the transport route, along the grid connection route or within the development footprint, an Invasive Species Management Plan will be prepared prior to construction works commencing.		CEMP	CEMP	Pre-construction Construction	Contractor / ECoW
Chapter 6 Biodiversity Chapter 10 Water Appendix B-2 CEMP	Protection of Water Quality - Concrete Control	<ul style="list-style-type: none"> •To avoid spillage and to reduce the potential for cementitious material entering watercourses, concrete pours will be supervised by the Construction Manager, a suitably qualified Engineer and the Ecological Clerk of Works. •The Construction Manager will ensure the pour area is completely drained of water before commencement of a pour. Pours will not take place during forecasted heavy rainfall. •There will be a designated, contained and impermeable concrete washout area located away from drains. Concrete trucks will be washed out off-site at the source quarry with no disposal of concrete remnants permitted on site. •A Construction Wheel Wash will be used to wash truck tyres leaving the construction site. Water residue from the wheel wash will be fed through a final settlement pond, interceptor and then discharged to a settlement pond. The wheel wash area will be cleaned regularly so as to avoid the buildup of residue. •Wet concrete operations are not envisaged for this site within or adjacent to watercourses or aquatic zones, however if required in such locations, a suitable risk assessment will be completed prior to works being carried out. 		CEMP	CEMP	Construction	Contractor

Environmental Planning Conditions & Commitments (Sheet 2)							
Planning Condition (PC) Number; or EIAR Chapter / EIAR Appendix Commitment	Topic	Commitment	Related Planning Condition (PC)	Related existing (draft) Document	To be Covered in Construction Document	Project Phase	Responsible Party
Chapter 6 Biodiversity Chapter 10 Water Appendix B-2 CEMP	Protection of Water Quality – Fuel/Refuelling Management	At construction stage, a Fuel Management Plan (which will form part of CEMP) will be developed specific to the site and the particular plant and equipment required for construction. The plan outlined will have regard to the following elements: <ul style="list-style-type: none"> •Mobile bowsers, tanks and drums should be stored in a secure, impermeable storage area, away from drains and open water •Fuel containers should be stored within a secondary containment system e.g. bund for static tanks or a drip tray for mobile stores •Ancillary equipment such as hoses, pipes must be contained within the bund •Taps, nozzles or valves should be fitted with a lock system •Fuel and oil stores, including tanks and drums, should be regularly inspected for leaks and signs of damage •Only designated trained operators should be authorised to refuel plant on site •Procedures and contingency plans should be set up to deal with any emergency accidents or spills •An emergency spill kit with oil boom and absorbers is to be kept at the site compound, and in site vehicles and machinery, to ensure immediate containment of a spill. All vehicle/machinery operators will be trained in the use of spill kits and the correct containment and cleaning up of oil spills/leaks. •In the event of a major oil spill, a company who provide a rapid response emergency service for major fuel spills will be immediately called for assistance, their contact details will be kept in the site office and in the spill kits. •The site Environmental Representative will be immediately informed of any oil leak/spill and will inspect nearby drains for the presence of oil, initiating a clean-up if necessary. The following measures will be undertaken to avoid or minimise negative effects to water quality as a result of the use of hydrocarbons: <ul style="list-style-type: none"> •Refuelling will be carried out using 110% capacity double-bunded mobile bowsers with spill containment equipment and operated by trained personnel. •Plant nappies or absorbent mats will be placed under refuelling point during all refuelling to absorb drips. •No refuelling shall take place within 50m of any watercourse. •To reduce the potential for oil leaks, only mechanically sound vehicles and machinery will be allowed onto the site. An up to date service record will be required from the main Contractor. •Collision with oil stores will be prevented by locating oils within a steel container in a designated area of the site compound away from vehicle movements. •Long term storage of waste oils will not be allowed on site. These waste oils will be collected in leak-proof containers and removed from the site for disposal or re-cycling by an approved service provider 		CEMP	CEMP	Construction	Contractor
Chapter 6 Biodiversity Chapter 2 Description of Proposed Project Appendix B-2 CEMP	Biodiversity - Disturbance to Fauna (general measures)	<ul style="list-style-type: none"> •Spraying of vegetation using pesticides (herbicides, fungicides and insecticides) will not be permitted at any stage of development. •Habitat disturbance will be limited by controlling the movement of maintenance vehicles. Construction vehicles will not encroach onto habitats beyond the proposed development footprint; •Duration of construction activities will be restricted to between 08.00 and 18.00, Monday to Friday, and between 08.00 and 13.00 on Saturdays. Construction work will not take place at night unless in exceptional circumstances to reduce potential disturbance to fauna. (Note: Delivery of oversized wind turbine components will occur outside of these times to minimise traffic nuisance and in line with any typical abnormal loads licence conditions imposed by the various relevant granting Local Authorities. Turbine erections may also occasionally occur outside of these times to take full advantage of low wind periods); •In the unlikely event that protected faunal species are found actively using the site for breeding/roosting during the construction phase, works will cease immediately, and the area will be cordoned off until advice is sought from a suitable qualified expert/NPWS. •Should the resting or breeding places of any protected species be discovered within the site during construction works, the NPWS will be informed. Any mitigations required for badgers will be carried out under license from NPWS, and using NRA Guidelines (2005) (now TII) where applicable; and Guidelines for the Treatment of Otters/Badgers prior to the Construction of National Road Schemes. 		CEMP	CEMP	Construction	Contractor
Chapter 6 Biodiversity Chapter 9 Water Appendix B-2 CEMP	Biodiversity – Protection of Water Quality and Natura 2000 sites	The most appropriate best practice method will be adopted for any/all water crossings in consultation with Inland Fisheries Ireland. Water crossing methods will not directly affect the watercourses or associated species such as otter. Nevertheless, care is required when working near watercourses to ensure that pollutants do not spill or seep into the aquatic environment. In this respect, all works will be carried out in compliance with the conditions and procedures set out in the CEMP. A water quality monitoring programme will be implemented as follows: <ul style="list-style-type: none"> •At times of heavy rainfall and major ground works/concrete pours during the construction phase of the development, daily inspection and immediate maintenance (if necessary) will be carried out on all elements of the drainage system including clean and dirty water drains and settlement ponds; •Parameters checked on these occasions will include pH, turbidity and suspended solids; •Weekly laboratory water quality monitoring at selected outflows from the settlement ponds, or additional if deemed necessary by the ECoW. •Weekly monitoring will include visual inspection, and field hydrochemistry (in-situ physico-chemical parameters) at selected sites. Weekly parameters checked will include pH, temperature, turbidity, TSS, conductivity, and dissolved oxygen; 		CEMP	CEMP	Pre-construction / Construction	Employer / Contractor
Chapter 6 Biodiversity Appendix B-2 CEMP	Biodiversity – Tree Felling & Lighting/Bats	If felling of trees with bat roosting potential (i.e. mature trees with voids, cracks, loose bark and/or ivy cover) is required, a bat survey will be required by a suitably qualified bat ecologist prior to felling; as such works have the potential to cause disturbance and/or damage to roosting bats. Should any tree roosts be identified, a derogation licence from the NPWS will be required to fell or undertake works in close proximity these trees. If felling of such mature trees is required, the mitigation measures for bats will observe guidelines contained in the following: <ul style="list-style-type: none"> •Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (TII, 2005) •Guidelines for the treatment of bats during the construction of National Road Schemes (TII, 2006); and •NPWS Irish Wildlife Manuals, No. 25: Bat Mitigation Guidelines for Ireland (Kelleher & Marnell, 2006). A felling distance of 86m around each proposed turbine will be maintained so as to comply with Natural England (2014) guidelines for minimising impacts to foraging bats. This calculation is based on turbine blade length of 65m, hub height of 101m and tree heights (Sitka spruce) of 20m. Any lighting introduced to the construction site will follow guidance in the documents: <ul style="list-style-type: none"> •Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25 (Kelleher and Marnell, 2006); and •Bats & Lighting. Guidance Notes for: Planners, engineers, architects and developers (BCI, 2010). 		CEMP	CEMP	Construction	Contractor / ECoW

Environmental Planning Conditions & Commitments (Sheet 2)							
Planning Condition (PC) Number; or EIA Chapter / EIA Appendix Commitment	Topic	Commitment	Related Planning Condition (PC)	Related existing (draft) Document	To be Covered in Construction Document	Project Phase	Responsible Party
Chapter 6 Biodiversity Appendix B-2 CEMP	Biodiversity – Management of Invasive Species	<ul style="list-style-type: none"> •Good construction site hygiene will be employed to prevent the introduction and spread of problematic invasive alien plant species (e.g. Himalayan Balsam, Japanese Knotweed etc.) by thoroughly washing vehicles prior to leaving any site; •Before arriving at the site, all plant and equipment will be thoroughly cleaned down using a power washer unit, and will be visually inspected to ensure all adherent material and debris has been removed; •All footwear/waders and all equipment that will be placed within the water will be treated to prevent foreign flora/fauna entering the water, and after use to prevent the spread to other catchments; •All washing must be undertaken in areas with no potential to result in the spread of invasive species. This process will be detailed in the contractor's method statement; •All planting and landscaping associated with the proposed development shall avoid the use on invasive shrubs; and •Non-native species control will be practised according to the following IFI documents, noting that some works components are located at/near watercourses: <ul style="list-style-type: none"> o'IFI Biosecurity Protocol for Field Survey Work' (IFI, 2010); o'Disinfection of scuba diving equipment' (IFI, 2011); and o'Invasive species biosecurity guidelines for boaters' (IFI, 2013). 		CEMP	CEMP	Construction	Contractor / ECoW
Chapter 6 Biodiversity	Biodiversity – Water Quality / Fish Stock Monitoring	<p>Natural re-growth of vegetation is anticipated on fell areas, subsequent to construction. This will assist in controlling sediment and phosphorous release. If natural re-growth is found to have been unsuccessful, seeding with an appropriate mix will be undertaken. The mix will be from an approved supplier, or locally harvested.</p> <p>A programme for the ongoing monitoring of water quality in site watercourses/drains and drainage outfalls during the construction period will be implemented with the agreement of the local authority(s). It is considered that biological water quality monitoring is sufficient for surface water quality monitoring during operation phase.</p> <ul style="list-style-type: none"> •Macroinvertebrates will be sampled annually on the first, second, third, fifth and tenth year at aquatic sites listed in Appendix 6-1. •Biotic indices corresponding with those used in Appendix 6-1, as well as Functional Feeding Group Analysis will be carried out in line methodology described in Appendix 6-1. •Monitoring should continue during the early operational phase until vegetation has re-established but effort can be reduced as appropriate by the ECoW. •Once the ECoW is satisfied that the vegetation has re-established, baseline water quality monitoring during the early operational phase of works on streams and rivers draining the site will be carried out. This will be carried out at the same sites as the pre-construction sampling and should include biological and chemical sampling. <p>Given the baseline information obtained for fish in the receiving environment, fish stock surveys will be undertaken at the same sites and frequency as water quality surveys. Methodology will replicate that outlined in Appendix 6-1.</p>		CEMP	CEMP / Operational Plans	Pre-construction / Construction / Operations	Employer

Environmental Planning Conditions & Commitments (Sheet 2)							
Planning Condition (PC) Number; or EIAR Chapter / EIAR Appendix Commitment	Topic	Commitment	Related Planning Condition (PC)	Related existing (draft) Document	To be Covered in Construction Document	Project Phase	Responsible Party
Chapter 6 Biodiversity	Biodiversity - Ecological Enhancement Management Plan	<p>An Ecological Enhancement Management Plan (EEMP) shall be developed by an ecologist to provide a framework for the conservation and enhancement of ecological features during operation stage and beyond.</p> <p>It is recommended that the EEMP should be implemented over a three-year period from when the site becomes operational, and enhancement measures will be incorporated into the CEMP, as necessary. Enhancement measures should be monitored for effectiveness over the first five years and, based on the results, alterations and/or further enhancements should be undertaken. Following on from this the area will be routinely assessed as part of a program of habitat surveys carried out in line with the EEMP. Peat habitat reinstatement, establishment of stream buffer zones/forestry set back distances, woodland creation, pond creation, bat and box installation will feature in the EEMP as outlined below, aimed to recommended to increase the overall biodiversity of the proposed development site.</p> <p>Habitat Reinstatement Mitigation in soil management as outlined above will ensure topsoil will be retained for use during reinstatement. The following methodology shall be employed for the habitat reinstatement of cutover habitats along tracks and turbine hard stands:</p> <ul style="list-style-type: none"> •A layer of topsoil/peat will be spread evenly over the area. •These areas shall then be temporarily fenced off and allowed to regenerate naturally. •No fertiliser or herbicide shall be applied; •Potential scrub encroachment will be monitored and appropriate measures adopted if required to manage any potential encroachment; and • Where vegetation is slow to regenerate, native plant species will be planted. The project ecologist will advise on the appropriate species and planting requirements to be mimic the existing nature of the semi-natural habitats in the area. <p>Peat Habitat Restoration Removal of forestry is a proven restoration measure, and has been used effectively at a number of raised bogs in Ireland (Mackin et al., 2017). Areas within the proposed development currently classified as conifer plantation were previously peat habitats but these areas have now been altered by drainage and other impacts associated with commercial plantation.</p> <p>An area to the south of T11 and T12 that is currently under commercial forestry will be selected for peatland restoration. The aim of the restoration work will be re-establishing the original hydrology conditions of the peat, connecting the site to bog/wet heath immediately adjacent to the north/east, and to prevent further drying.</p> <p>Any peat habitat restoration will be in line with guidance in 'Best practice in raised bog restoration in Ireland' (Mackin et al., 2017) and the National Peatlands Strategy (NPWS, 2017). The basic enhancement measures are outlined here and can be adapted with reference to Mackin et al. (2017) according to conditions and tree characteristics:</p> <ul style="list-style-type: none"> •Trees within the selected restoration area will be manually felled by chainsaw; • Branches will be removed from trees and pruned material will be packed into the drains to slow down the movement of water across and out of the site along these features particularly in reference to the headwaters of the Carraig An Langáin Stream; •An excavator (smaller size) with 1000mm tracks will be brought in to block the drains using dams constructed of: omechanically installed peat removed from the construction zone; or oboles from felled Sitka spruce; and •Fencing will be installed to prevent grazing animals from trespassing. <p>Monitoring of the enhancement measures effects is important and will include:</p> <ul style="list-style-type: none"> •Monitoring the recovery of the bog vegetation for the duration of the project/lifetime of the project; and •Hydrological monitoring to assess the hydrological recovery of the peat. <p>Riparian Buffer Zones & Forestry Setback Distances A riparian buffer zone will be created to provide a buffer between the watercourses within the site and conifer plantation. Guidance described in the "Environmental</p>		CEMP	CEMP / Operational Plans	Pre-construction / Construction / Operations	Employer
Chapter 6 Biodiversity	Biodiversity - Bats	<p>Post construction bat surveys will be carried out to assess the effectiveness of the proposed mitigation measures and will take place on the first, second, third, fifth and tenth year of operation. The NPWS will be contacted to discuss the full scope and timing of these surveys prior to the completion of the construction phase.</p> <p>The surveys will include fatality searches for bats and post construction bat monitoring developed and undertaken in line with recommendations in Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation (SNH, 2019), and those recommended by Bat Conservation Ireland (BCI, 2012).</p> <p>The use of 'white lights' on operational turbines will not be permitted as they can attract insects, which in turn can attract bats. Any lighting introduced to the site post construction will follow guidance in the documents:</p> <ul style="list-style-type: none"> •Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25 (Kelleher and Marnell, 2006); and •Bats & Lighting. Guidance Notes for: Planners, engineers, architects and developers (BCI, 2010). <p>Any form of lighting on the turbines or other structures will have to be agreed in advance with the Irish Aviation Authority.</p>			Operational Plans	Operations	Operations Manager
Chapter 6 Biodiversity Chapter 7 Ornithology	Biodiversity & Ornithology	<ul style="list-style-type: none"> •During decommissioning, disturbance limitation measures will be as per the construction phase. •Plant machinery will be turned off when not in use. •All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996). 				Decommissioning	Operations Manager
Chapter 7 Ornithology; Chapter 17 Schedule of Mitigation	Grid Connection - Cables	Grid connection route Option B has been selected to utilise built infrastructure for the entire length (i.e. cables to be laid within public roads). Cables will be laid underground to avoid effects on roadside hedgerows and disturbance to nesting birds		CEMP	CEMP	Construction	Contractor
Chapter 7 Ornithology; Chapter 17 Schedule of Mitigation	Ornithology / Habitats	Construction of access roads and areas of hard standing will be kept to a minimum to reduce habitat loss as much as possible. Direct habitat loss will be minimised by upgrading existing access tracks, where possible.		CEMP	CEMP	Construction	Contractor
Chapter 7 Ornithology; Chapter 17 Schedule of Mitigation	Ornithology – Tree Felling	Pre-construction tree felling should be undertaken outside of the bird breeding season (March to August). Damage or loss of trees thereafter will be restricted. Any vegetation clearance required, including the cut back, and any clearance of hedgerows, and scrub will take place outside the breeding season (March to August, inclusive).		CEMP	CEMP	Pre-construction Construction	Contractor / ECoW

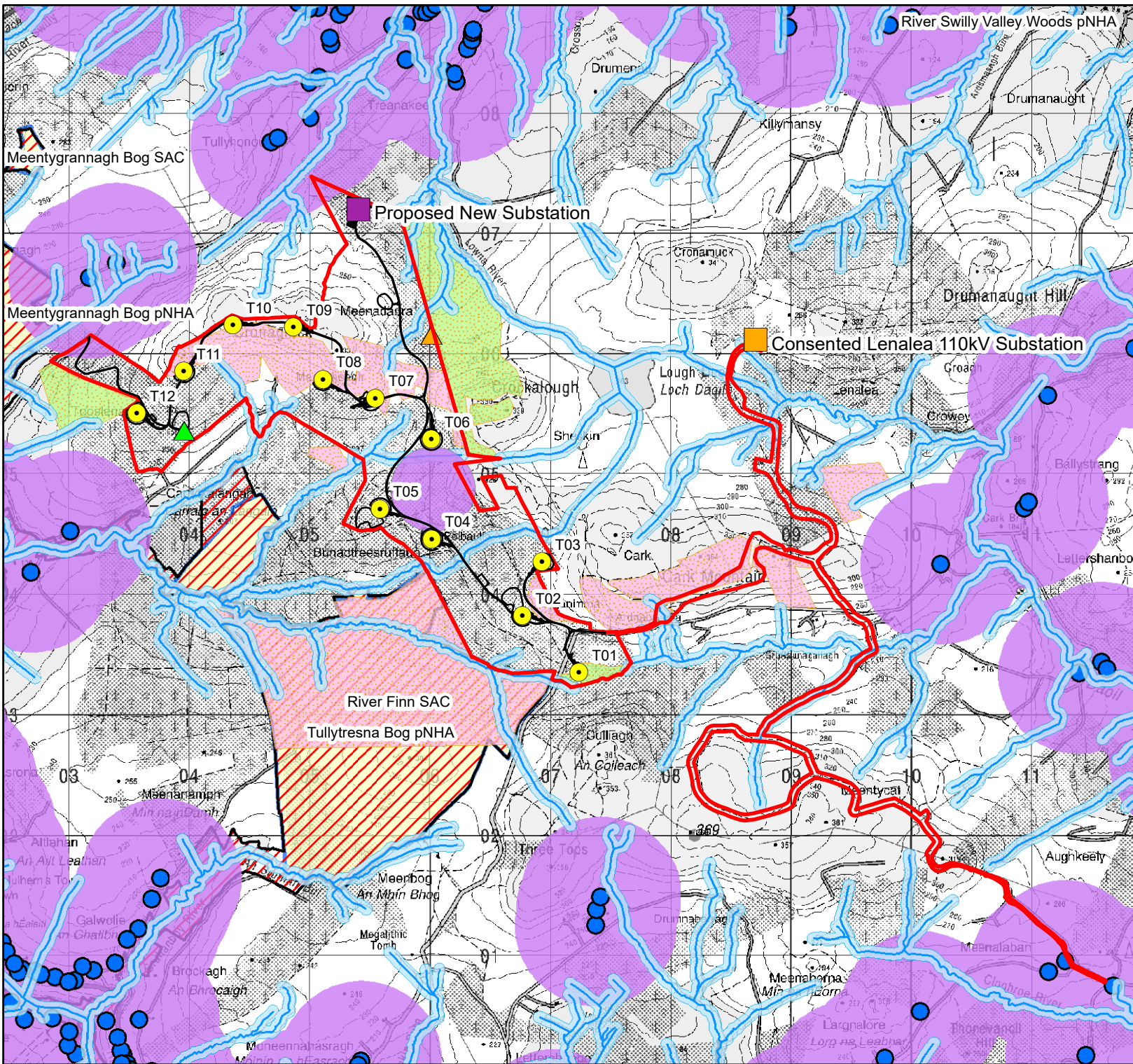
Environmental Planning Conditions & Commitments (Sheet 2)							
Planning Condition (PC) Number; or EIA Chapter / EIA Appendix Commitment	Topic	Commitment	Related Planning Condition (PC)	Related existing (draft) Document	To be Covered in Construction Document	Project Phase	Responsible Party
Chapter 7 Ornithology Appendix B-2 CEMP	Biodiversity – Otter	A pre-construction breeding survey will be conducted from late February at the proposed wind farm development location and adjacent to assess any evidence of Merlin activity or taking up territories. Should Merlin be present, works at these locations will be restricted to outside the breeding season (March to August). If breeding activity is identified, the nest site location will be determined as accurately as possible without and no works shall be undertaken within a 300m buffer. No works are anticipated within the 300m buffer zone. If the nest location shifts closer to the proposed infrastructure, no works shall be permitted until it can be demonstrated that that Merlin are no longer reliant on the nest site.		CEMP	CEMP	Pre-construction Construction	Employer / Contractor / ECoW
Chapter 7 Ornithology Appendix B-2 CEMP	Biodiversity – Avian Disturbance (general measures)	<ul style="list-style-type: none"> •Displacement and/or disturbance impacts, and habitat degradation will be limited by controlling the movement of maintenance vehicles; maintenance vehicles will not encroach onto habitats beyond the project footprint and, with the exception of maintenance works on the site drainage system. •The felling of forestry will take place outside the breeding season (March to August, inclusive). Keyhole felling will be applied to minimise the amount of trees to be removed for the development footprint, thereby limiting the habitat loss within the conifer plantation habitat. •Any vegetation clearance required, including the cut back, and any clearance of hedgerows, and scrub will take place outside the breeding season (March to August, inclusive) •Where possible, construction will take place outside the breeding season (March to August, inclusive) to minimise disturbance, and or displacement to breeding birds •Exclusion Zones will be installed to ensure the works do not advance past already altered habitat. Habitat degradation will be limited by controlling the movement of construction vehicles and machinery within the exclusion zones. •In the unlikely event that protected bird species are found actively using the site for breeding and or roosting in the proximity of works during the construction phase, works will cease immediately, and the area will be cordoned off until advice is sought from the Project Ornithologist/ECoW. •Where it is not possible to restrict construction work in this way, work will commence prior to the breeding season, to ensure that any incubating birds or birds with young are not displaced by work commencing during, or within the breeding season •Off-road vehicle activity will be minimised. Habitat disturbance to birds will be limited by controlling the movement of plant, and site vehicles during the construction and operational phases of the wind farm. Plant, and other site vehicles will not encroach onto habitats beyond the project footprint and, with the exception of maintenance works on the site drainage and settlement ponds, will not enter the bogland habitats •Plant machinery will be turned off when not in use. All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations 1996 (SI 359/1996) and other relevant legislation. Plant and equipment will be turned off when not in use, with no unnecessary revving. 		CEMP	CEMP	Pre-construction Construction	Employer / Contractor / ECoW
Chapter 7 Ornithology Appendix B-2 CEMP	Ornithology - Merlin	The construction phase of the project will likely be spread across the summer and winter survey periods. Vantage Point surveys will be carried out as outlined in Section 7.2.2 in Chapter 7. If a merlin nest is detected within 300m of the permitted construction works or within the general location of the wind farm site, the following will be carried out: <ul style="list-style-type: none"> •The Project Ornithologist will immediately notify NPWS •The location of the nest will be treated as an Ecological Sensitive Area, and will be kept from the public domain •All high impact, and heavy construction works will be suspended within 300m of any merlin nest site; •Management measures for the protection of any merlin nest site at the site will be discussed and agreed with NPWS •Following the implementation of management measures, an exclusion zone will be installed and enforced throughout the construction phase of the project; •The Project Ornithologist will monitor the Ecological Sensitive Area, and will liaise with NPWS to ensure all mitigations measures agreed with NPWS are fully implemented. 		CEMP	CEMP	Pre-construction Construction	Employer / Contractor / ECoW
Chapter 7 Ornithology	Biodiversity - Ornithology	Bird surveys will be carried out prior to and during the construction phase, and will continue during the operational phase. The timing and extent of bird surveys will be agreed with NPWS and consultations will remain ongoing with NPWS throughout the operational phase of the project. A detailed Operational Avian Monitoring Programme will be prepared for the operational phase of the proposed development. The monitoring programme will include: <ul style="list-style-type: none"> •Breeding Surveys (with particular focus on Merlin); •Merlin roost surveys; •Winter Bird Surveys; and •Targeted bird collision surveys (corpse searches). Whether the project proceeds or not, the forestry operations will continue at the site. If the project proceeds, it is recommended that any future felling timed during breeding season will include pre-felling monitoring for breeding merlin. This monitoring can coincide with the operational phase monitoring described in the previous section. Operational phase monitoring can inform on any merlin breeding activity at the overall forestry site.		CEMP	CEMP / Operational Plans	Pre-construction / Construction / Operations	Employer Contractor / ECoW

Environmental Planning Conditions & Commitments (Sheet 2)							
Planning Condition (PC) Number; or EIAR Chapter / EIAR Appendix Commitment	Topic	Commitment	Related Planning Condition (PC)	Related existing (draft) Document	To be Covered in Construction Document	Project Phase	Responsible Party
Chapter 9 Land and Soil Chapter 10 Water Chapter 6 Biodiversity Appendix B-2 CEMP	Management of Excavations	<ul style="list-style-type: none"> Where possible, existing forestry tracks will be used to access turbine locations, reducing the volume of material excavated and volumes of crushed rock imported for road construction. If necessary, floated roads will be utilised minimising volumes of any peat excavation. Every effort will be made to ensure that the amount of earth materials excavated is kept to a minimum in order to limit the impact on land and soil. Peat excavated from turbine bases, hardstanding, roads, cable routes, grid connection and substation during construction will be reused for localised landscaping and reprofiling with excess peat deposited in the material storage areas and peat deposition areas. Excavation will be carried out from access roads or hardstanding areas to reduce the compaction of peat. Earth movement activities will be suspended during periods of prolonged rainfall events to avoid or minimise negative effects to water quality. Construction of the new access roads will be carried out by excavation of the peat followed by placement of a separation layer (e.g. Terram), followed by replacement with compacted crushed rock. Machinery will not operate directly on excavated/stockpiled peat. Drainage will be constructed in parallel with road construction and turbine excavation. Drainage (including drains, stilling ponds etc) will be constructed using bog mats or "bogmaster" excavators when working in deeper peat areas. This approach will be used in combination with the installation of other drainage protection measures in advance of construction e.g. silt fencing. Excavations for turbine foundations, hardstands and the roadway from T8 to T9 will be completed to a location specific temporary works design completed by a suitably qualified and experienced temporary works designer. This is likely to involve creating safe side slope angles, installation of drainage around and within the excavation and installation of sediment control measures within the drainage system. Within and around excavations, pore-water pressure will be kept low by avoiding loading the peat with spoil or machinery, and by giving careful attention to the existing drainage and how structures could affect it. Removal of peat to approved material storage areas and peat deposition areas will avoid the need for storage adjacent to excavations. All temporary cuts/excavations will be carried out such that they are stable or adequately supported. Where appropriate and necessary, cuts and excavations will be protected against ingress of water or erosion by the use of cut off drains around the excavation works. Temporary works will be such that they do not adversely interfere with existing drainage channels/regimes. Plant and materials will be stored in approved locations only (such as the proposed site compound), and will not be positioned or trafficked in a manner that would surcharge existing or newly-formed slopes. Temporary storage of material beside the trenches should be done in line with the CEMP. Excavated peat from the cable route will be used to landscape and reinstate the area around the cable trench following backfilling of the trench with approved materials. The angle of the peat reinstated at the top of the infilled trenches will not exceed 5°. Site management should include the checking of equipment, materials storage and transfer areas, drainage structures and their attenuation ability on a regular basis during the construction phase of the project. To prevent excessive dust build-up, blast areas will be lightly sprayed with water prior to blasting. Donegal County Council and the NPWS will be notified in advance of any blasting activities on the site. To mitigate against soil/land erosion, vehicular movements will be restricted to the footprint of the permitted development, particularly with respect to the newly constructed access roads. 		CEMP	CEMP	Construction	Contractor
Chapter 9 Land & Soils Chapter 10 Water Appendix B-2 CEMP	Management of Ground/Slope/Peat Stability	<ul style="list-style-type: none"> All site excavations and construction will be supervised by a suitably experienced engineer. The Contractor's method statements for each element of work will be reviewed and approved by the engineer prior to site operations. Specific method statements will be developed for each turbine and hardstanding location within the site. A Peat Stability Risk Assessment Report is included in Volume 3 of the EIAR. Particular emphasis shall be placed in the Contract that only operators of proven experience in working in peatlands are employed for any work element involving excavation, handling or placement of peat. Due to peat's fluid-like properties, all peat excavated will be immediately removed from work areas. If peat is required for reinstatement, then acrotelm peat (<0.5m shallow, living layer) shall be stripped off the surface of the excavated area and placed carefully at the margins of the work area along the access road and hardstand margins that are characterised by near-horizontal slopes (<3°) From previous landslide evidence (Pollatomish Landslide Co. Mayo, Derrybrien Landslide Co. Galway) and historic occurrences, it is strongly recommended that construction activities be assessed for impact after prolonged periods of heavy rainfall . To mitigate against slope failure, rock blasting will only take place within borrow pits, road cutting etc. if extraction using rippers or hydraulic breakers is deemed impractical. If rock blasting proves to be necessary, a detailed blasting design will be carried out by a suitably qualified and experienced specialist to ensure that a peak particle velocity (PPV) of 10 mm/s is not exceeded at a distance of greater than 20m from the blast holes as per BS 7385 Part 2: 1993. If this cannot be achieved, blasting will not be permitted at this location. It is recommended that an emergency response system be developed for the construction phase, particularly during the early excavation phase. These responses should include cessation of construction until the storm event, including storm runoff, has passed over. This requirement is also included in the CEMP. 		CEMP	CEMP	Construction	Contractor
Chapter 9 Land and Soils Chapter 3 Civil Engineering Chapter 10 Water Appendix B-2 CEMP	Storage and Management of Excavated Material	<ul style="list-style-type: none"> The design of the access road and the location of the turbines will reduce overall peat extraction. The handling, storage and management of excavated spoil will be carried out in line with an approved CEMP. Site management will check equipment, materials storage and transfer areas, drainage structures and their attenuation ability on a regular basis during the construction phase. The peat/material storage areas will be reinstated by planting and re-seeding to provide resistance against rainfall events, and to minimise sediment and nutrient release until natural re-vegetation is established. The use of pre-seeded matting will also be considered if required. Drainage measures will be provided for the reinstated peat/material storage areas as presented in Chapter 3 Civil Engineering and Chapter 10 Water, and will include cut-off drains at the top of slopes, toe drains at the base of slopes, settlement ponds and silt fencing as required. 		CEMP	CEMP	Construction	Contractor
Chapter 9 Land and Soils	Management of Ground/Slope Stability	Concrete bases will be left in the ground, covered with topsoil and allowed to naturally re-seed in line with IWEA best practises (IWEA, 2017). The area around the bases will be covered with locally sourced soil for vegetation regeneration and reduction of run-off and sedimentation effects. The decommissioning mitigation measures form part of the environmental assessment required at the end of the design life of the wind farm.			Operational Plans	Decommissioning	Operations Manager
Chapter 9 Land and Soils	Management of Ground/Slope Stability	All vehicular movement during operation and maintenance will be restricted to the areas of hardstanding and existing/newly constructed access roads.			Operational Plans	Operations	Operations Manager

Environmental Planning Conditions & Commitments (Sheet 2)							
Planning Condition (PC) Number; or EIA Chapter / EIA Appendix Commitment	Topic	Commitment	Related Planning Condition (PC)	Related existing (draft) Document	To be Covered in Construction Document	Project Phase	Responsible Party
Chapter 10 Water Chapter 6 Biodiversity Appendix B-2 CEMP	Protection of Water Quality – Tree Felling / Heavy Rainfall	<ul style="list-style-type: none"> All tree felling to be undertaken using good working practices as outlined by the Forest Service in their 'Forestry Harvesting and Environment Guidelines' and the 'Forestry and Water Quality Guidelines' (DMNR, 2000). All excess felled brash will be removed from site to avoid release and runoff of phosphorous. Brash mats will be used where necessary on any off-road harvesting routes, and removed and replenished if becoming worn. During periods of heavy precipitation and run-off, works will be halted or working surfaces/pads will be provided to minimise soil disturbance. Any requirement for temporary fills or stockpiles will be covered with polyethylene sheeting to avoid sediment release during periods of heavy rainfall. 		CEMP	CEMP	Construction	Contractor
Chapter 10 - Water Chapter 6 Biodiversity Appendix B-2 CEMP	Protection of Water Quality – Temporary Construction Compound/Storage	<ul style="list-style-type: none"> Drainage within the temporary site compound will be directed to an oil interceptor to prevent pollution if any spillage occur. A bunded containment area will be provided within the compound for the storage of fuels, lubricants, oils etc. The storage of materials, containers, stockpiles and waste, however temporary, should follow best practice at all times and be stored at designated areas. Temporary storage of cement bound granular mixtures will always be in a Control of Substances Hazardous to Health (COSHH) store or similar (shipping container). To prevent direct drainage of cement storage areas to surface waters and to contain any solids run-off, cement products located in the open will be placed on hardstand or an impermeable bunded area, and sheeted to prevent contact with rainwater 		CEMP	CEMP	Construction	Contractor
Chapter 11 Noise Appendix H-2 CTMP Appendix B-2 CEMP	Noise	Best practice in the form of BS5228 –1&2, Code of Practice for the Control of Noise and Vibration on Construction and Open Sites (2009, amended 2014) should be adopted during the construction phase in order to minimise the noise generated by construction activities and nuisance to neighbours.		CEMP	CEMP	Construction	Contractor
Chapter 11 Noise	Noise	Post commissioning operational phase noise monitoring should be carried out to ensure compliance with the relevant planning noise limit criteria in accordance with guidance outlined in the UK Institute of Acoustics Good Practice Guide Supplementary Guidance Note 5: Post Completion Measurements (July 2014).			Operational Plans	Operations	Operations Manager
Chapter 13 Cultural Heritage	Archaeology/ Cultural Heritage	<ul style="list-style-type: none"> Licensed archaeological test excavations should be undertaken in advance of construction at targeted areas of all primary ground impacts associated with the proposed development. Based on the results of these tests, further mitigation measures may be required such as the archaeological monitoring of construction works. Potential directional drilling, geo-technical test-pits and other pre-construction groundworks should also be archaeologically monitored. The three upland Malt Settlement Sites should be (1) archaeologically recorded and surveyed including plans and elevations; (2) a 20m buffer zone should be established around them by the project archaeologist in advance of construction to avoid any accidental damage during construction; (3) a report on the results should be submitted to the planning department of Donegal County Council and the National Monuments Service on completion. All five proposed re-planting sites in Counties Clare, Galway, Limerick and Cork should be archaeologically surveyed, supported by targeted UAV imagery in advance of planting. Based on these survey results, further archaeological work may be required including mitigation by avoidance, licensed test excavations and archaeological monitoring. Zone of Notification (40m) of recorded Enclosure LI047-031 at Ballincolly, Co. Limerick should be physically established on the ground by qualified archaeologist and excluded from re-planting process. In a wider cultural context, the remains of the vernacular settlements at Craghera, Co. Clare should be (1) fully archaeologically surveyed including plans and elevations; (2) mitigation by avoidance viz an appropriate 20m zone of planting exclusion should be established around the relict sites based on the results of the archaeological survey. 		CEMP	CEMP	Pre-construction Construction	Employer / Contractor
Chapter 14 Shadow Flicker	Shadow Flicker	A computer model has concluded that there is the potential for shadow flicker to occur and has identified the times at which this may arise. Turbines will be installed with shadow flicker control modules which will be programmed to shut down during periods when shadow flicker is predicted to occur. This strategy has been successfully employed at other wind farms.			Operational Plans	Operations	Operations Manager
Chapter 15 Material Assets	Residential Amenity /Material Assets	As is standard practice, a signed Protocol between the Developer and RTÉ will be put in place making it the responsibility of the Developer to rectify any television reception issues that arise as a result of the operation of the turbines. Interference is not likely however, as the wind farm does not appear to be located between receptors and television transmitters. Similarly in the event of unforeseen interference to the telecommunication services arising from the wind farm development, the Developer will work with telecommunication providers to remedy any issues of interference to affected communication links.				Pre-construction / Operations	Employer
Chapter 15 Material Assets	Residential Amenity/ Material Assets	Mitigation measures will be required for television reception and communication links that are impacted by the proposed wind farm scheme at Drumnahough. A range of viable mitigation measures are available and the solution to interference with TV reception or communication links will depend on where the residence receives signal from. As referred to above, a Protocol will be agreed with RTÉ and the Developer so as to rectify any television reception interference that arises due to turbine operation. If interference to the telecommunication services arises from the wind farm development, the developer will work with telecommunication providers to remedy any issues of interference to affected communication links.			Operational Plans	Operations	Operations Manager
Appendix H2 - CTMP; Chapter 17 Schedule of Mitigation	Construction Traffic Management Plan (CTMP)	A preliminary Construction Traffic Management Plan (CTMP) has been prepared for the project and will be implemented during construction to manage traffic to and from the site. It includes details of the road network to be used by construction traffic, including over-sized loads, and detailed arrangements for the protection of bridges or other structures to be traversed, as may be required. The timing of turbine delivery along the proposed haulage route will be agreed with Donegal County Council and An Garda Síochána to ensure that the impact on the public is minimised. A final CTMP will be prepared by the Appointed Project Contractor and will take account of the measures specified in the preliminary CTMP submitted with the planning application and any measures agreed with the relevant authorities.		Construction Traffic Management Plan (CTMP); Appendix H-2 CTMP	CTMP	Pre-construction Construction	Contractor
Appendix H-2 CTMP Appendix B-2 CEMP	Traffic	<ul style="list-style-type: none"> Ensure regular maintenance of plant and equipment. Technical inspection of vehicles to ensure they will perform most efficiently Implementation of the Traffic Management Plan to minimise congestion; All site vehicles and machinery to be switched off when not in use - no idling; and The majority of aggregate materials for the construction of the wind farm will be obtained from on-site borrow pits. This will reduce the number of delivered vehicles to site, thereby reducing the amount of emissions associated with vehicle movements. 		CEMP	CEMP / TMP	Construction	Contractor

Appendix B – Environmental Constraints Map

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- ### Legend
- Proposed Turbine locations
 - Connection To Consented Lenalea 110kV Substation
 - Alternative Connection Option – Proposed New Substation
 - ▲ Met Mast
 - Site Boundary
 - ▲ Malt Kiln
 - Malt Kiln 20m Buffer
 - Merlin Nest 350m Buffer
 - Watercourse
 - Watercourse 50m Buffer
 - House Location
 - House Location 670m Buffer (4 x Tip Height)
 - Blanket Bog - PB2
 - Blanket Bog - PB2 (Drained)
 - Special Areas of Conservation (SAC)
 - Proposed Natural Heritage Areas (pNHA)

Map Reproduced From Ordnance Survey Ireland
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0 0.75 1.5 km

Project Title:
 Drumnahough Wind Farm

Client: SSE Renewables

Drawing Title:
 Constraints Map

Drawn: JK **Checked:** VH

Date: 11/09/2020 **Scale (A4):** 1:44,000



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Appendix C – Table 3.2 Main Tasks and Responsibilities

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KEY:

**TABLE 3.2
MAIN TASKS AND RESPONSIBILITIES**

Task	Contractor						Contractors / Sub-Contractors	Employer				Water Quality Consultant	Visitors
	Project Manager	Site Agent	Site Foreman	Environment Manager	Geotechnical Engineer	ECoW		Project Manager	Construction Manager	Environment Manager	ACoW		
Provide information (in accordance with contractual timelines)	☑												
Start Up Meeting	✓	x	x	x	x	x	(x)	☑	✓	✓	x		
Site Inductions	☑	✓	x	✓	x	✓	x	x	x	x	✓	x	x
Obtaining all relevant permissions, consents, licenses and permits	☑			✓		✓				✓	☑		
Weekly progress meetings including Contractor, Employer, Geotechnical Engineer, Environmental Specialist/Manager/Engineer) updates/issues	☑	x	(x)	✓	(x)	✓	(x)	(x)	x	(x)	✓		
Monthly or weekly Environmental Log / Report						☑					☑		
Liaison with regulator / statutory consultees	☑			✓		✓			✓		✓		
Environmental checks and monitoring (e.g. dust, oils and chemicals storage, drainage mitigation, waste management, plant etc)	✓	☑	☑	✓	✓	☑	✓		✓	✓	x		
Environmental monitoring and analysis (Water Quality Monitoring Plan)		✓		✓		✓				x		☑	
Ecological inspections and monitoring and compliance checks	✓	✓	✓			☑	✓						
Record keeping (e.g. waste documentation, licences, training, incidents, mitigation designs, material, waste and risk registers etc)	☑			✓	✓	☑		☑	✓	✓	☑		
Environmental audits / inspections	✓			☑		☑				☑	✓		
Communicating environmental observations and suggested improvements	☑			✓			☑		☑		☑		☑

- ☑ Lead / Responsible (may apply to several roles)
- ✓ Provide support (may apply to several roles)
- x Attend / take action (may apply to several roles)
- (x) Optional / as required

Note: This table details the main tasks / responsibilities. Following agreement between the Employer, the Contractor, tasks/responsibilities may be re-assigned.