LETTER WIND FARM LTD

# LETTER WIND FARM CO. LEITRIM

# CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

## MANAGEMENT PLAN 2 WATER QUALITY MANAGEMENT PLAN

### **DECEMBER 2023**

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#### LETTER WIND FARM, CO. LEITRIM

### WATER QUALITY MANAGEMENT PLAN (WQMP)

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### 1 INTRODUCTION

#### 1.1 Scope and Requirements

- **1.1.1** 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.
- **1.1.2** In order to verify the efficacy of pollution prevention and mitigation works during construction, Water Quality Monitoring is required to be undertaken by a suitably qualified Environmental Consultant(s), prior to, during and post completion of construction works. This will include all watercourses within the catchment of the construction area. The monitoring will comprise visual, hydrochemistry and grab sample monitoring.
- **1.1.3** The approved plan will be coordinated and implemented on site by the Environmental Consultant appointed by the Contractor.

#### **1.2** Reference Documentation

- 1.2.1 Construction works have the potential to cause pollution of the water environment. All construction works on site, and specifically construction works to be undertaken within and within 50m of any watercourses, will be completed in compliance with current legislation and best practice as detailed within the CEMP and in particular the Peat and Spoil Management Plan and the Surface Water Management Plan.
- **1.2.2** The following reports (along with any further surveys conducted) will be used to inform the scope of the construction phase Water Quality Management Plan.
  - Letter Wind Farm, Co. Leitrim Environmental Impact Assessment Report (EIAR), December 2023
  - Letter Wind Farm, Co. Leitrim Natura Impact Statement (NIS), December 2023
  - Letter Wind Farm, Co. Leitrim CEMP, December 2023



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#### 2 **RESPONSIBILITIES**

#### 2.1 General

- 2.1.1 Responsibility for the water quality monitoring programme, and coordination thereof, will lie with the independent Ecological Clerk of Works appointed at the start of the programme.
- 2.1.2 Prior to works commencing, the Ecological Clerk of Works will be retained by Letter Wind Farm Ltd with a responsibility to implement this Water Quality Management Plan. Among other requirements, the Water Quality Management Plan requires a full baseline water quality survey to be undertaken prior to the commencement of construction and requires the contractor to provide a 'schedule of work' to Ecological Clerk of Works at the beginning of each week.
- **2.1.3** The Contractor's Environmental Manager will prepare and deliver site induction and training to all construction personnel, in liaison with the Site Engineer.
  - Field monitoring (as described in **Section 3**) of water quality parameters and collection of samples will be undertaken by the Environmental Manager or other suitably appointed person(s) (qualified to degree level with at least 5 years' experience in a similar role) based at the site. The Environmental Manager or nominated site person(s) will be appropriately trained on the required monitoring methods and the use, calibration and maintenance of all monitoring equipment used. Training will be provided by the Environmental Consultant appointed to undertake the Water Quality Monitoring programme. Undertake specific monitoring activities and reporting as defined in agreed documentation prepared as part of the planning process.
  - Daily visual inspection of access roads for signs of ground damage or solids escape to nearby watercourses in vicinity of construction works.
  - The ground between the structure under construction and the nearest downslope watercourse for signs of solids escape or ground damage.
  - Surface water features in vicinity of construction works.
  - Any pollution control measures at structures and along access roads (e.g., silt fences, drain or stream crossings etc.) for evidence of contaminated run-off or mitigation failure.
  - Attendance at the critical work phases including: access road construction, foundation excavation, watercourse crossings, concrete pouring and back-filling.



- Collection and analysis of water samples at a number of monitoring locations (i.e., upstream & downstream of active construction work locations) before, during (if potential pollution visually identified) and after construction works at that location
- EPA Q Value Biological Monitoring at seven water crossing locations (i.e. upstream & downstream of instream construction work locations) before and after construction works.
- **2.1.4** Collection and analysis of water samples at a number of monitoring locations (i.e., upstream and downstream of construction work locations) before, during (if potential pollution visually identified) and after construction works.

#### 2.2 Hydrochemistry Monitoring

#### 2.2.1 Field Monitoring

Field monitoring of water quality parameters and collection of samples will be undertaken by the Environmental Manager. The Environmental Manager will be appropriately qualified to third level education and experienced in the field for no less than 5 years on the required monitoring methods and the use, calibration and maintenance of all monitoring equipment used. Sampling will be in accordance with International Standards of Operation. The chosen laboratory will be accredited.

#### 2.2.2 Laboratory Analysis

Laboratory analysis of water samples will also be undertaken as part of the monitoring programme by an independent and appropriately certified laboratory to be appointed by the Ecological Clerk of Works. ISO 17025 Accreditation proves a laboratory has an acceptable quality management system in place, and it has the ability and competence to provide testing and calibration results.

- **2.2.3** Coordination of the laboratory sampling and analytical programme will be undertaken by the Ecological Clerk of Works/EM. Samples will be dispatched for analysis under chain of custody procedures. Laboratory analytical results will be sent directly to the Ecological Clerk of Works.
- **2.2.4** Interpretation and reporting of both the field and laboratory data will be the responsibility of the Ecological Clerk of Works.



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#### 2.3 Reporting

#### 2.3.1 Monthly Water Quality Reporting

Results of water quality monitoring will assist in determining requirements for improvements in drainage and pollution prevention measures implemented on site. A monthly report on water quality will be prepared by the Environmental Manager (EM).

- 2.3.2 It will be the responsibility of the EM to present the ongoing results of water quality and weather monitoring at site meetings and with outside bodies. This will be done at weekly meetings and reported within the overall Monthly Environmental Report to be prepared by the Ecological Clerk of Works
- 2.3.3 The monthly reports on water quality will consider all visual, field monitoring and results of laboratory analysis received that month. Reports will describe how the results compare with baseline data as well as previous monthly reports on water quality. The reports will also describe whether any deterioration or improvement in water quality has been observed and whether any effects are attributable to construction activities and what remedial measures, or corrective actions have been implemented.
- **2.3.4** Monthly reports on water quality will be provided to the Client Project Manager and will be made available to the Planning Authority.

#### 2.3.5 Final Report on Water Quality

Upon completion of all post-construction monitoring, the Ecological Clerk of Works will prepare a final report on water quality. This final report will cover the overall performance against baseline data, details on any impacts attributed to construction works and recommendations for remedial works if required.

**2.3.6** The final report will be provided to Leitrim County Council and Inland Fisheries Ireland.

#### 2.4 Contingency Sampling & Emergency Response

2.4.1 In the event that a pollution incident arises which threatens to enter or has entered a watercourse from the construction works, additional sampling and analysis of surface water samples will be undertaken. Examples of such incidents include a spill or accidental release of chemicals, oils and fuels or concrete. Additional sampling and



analysis will determine the level of impact to the surface water receptor and remedial requirements, where necessary.

- 2.4.2 Where a pollution incident has occurred as a result of construction works, the Ecological Clerk of Works and Leitrim County Council will be consulted to determine sampling requirements and any additional survey requirements where potentially significant impacts are identified. This will be done following the implementation of appropriate mitigation measures as per the Emergency Response Plan (Management Plan 1 of this CEMP).
- **2.4.3** The results of any monitoring or survey work undertaken by the Contractor will be made available to the Ecological Clerk of Works and the Local Authority. Copies of all correspondence and test certificates will be retained on site.

#### 3 WATER QUALITY MONITORING: OUTLINE SCOPE

#### 3.1 General

- **3.1.1** Construction-stage details of monitoring and precise monitoring locations will be agreed in writing with the Local Authority prior to commencement of construction works and following consultation with Inland Fisheries Ireland.
- **3.1.2** Water Quality Monitoring locations will be identified through grid reference, photographic record and indicated on a plan. For repeat sampling locations, each location will also be marked on the ground (stake/post) to ensure that the correct location is sampled each time.
- **3.1.3** Sample locations will be labelled consistently for the duration of the monitoring period. Where any additional locations are sampled during the works, the location (grid reference) of the sampling point will be recorded and a photograph will be taken at time of sampling.
- **3.1.4** 'Control' sample locations will also be included in the scope of any monitoring.
- **3.1.5** A water sampling location map will be developed and included in the detailed method statements for precise locations at water crossings within this development.



#### 3.2 Hydrochemistry Monitoring

- **3.2.1** Sample locations, monitoring frequency and precise hydrochemistry parameters will be agreed in writing with Leitrim County Council, prior to commencement of construction, and following consultation with Inland Fisheries Ireland.
- **3.2.2** As a minimum, the monitoring programme will include:
- 3.2.2.1 At least one baseline monitoring visit.
- 3.2.2.2 Daily visual observation in areas of high construction activity or during high rainfall periods to identify any evidence of siltation, oil or silt. Visual inspections will include details of the colour of the water at the time of inspection.
- 3.2.2.3 Weekly visual inspections and monthly field hydrochemistry monitoring.
- 3.2.2.4 One round of post construction monitoring, to be agreed with Leitrim County Council. Post construction will be defined as when the reinstatement phase is completed.
- **3.2.3** Monthly analysis of water parameters will be carried out. Construction-stage analytical determinants (including limits of detection and frequency of analysis) will be specified and agreed with the Local Authority and third parties for each sample location. The agreed suite of grab sample determinants will include the following:

#### Parameters for hydrochemistry analysis

- pH
- Temperature
- Total Suspended Solids (TSS)
- Dissolved Organic Carbon (DOC)
- Conductivity
- Dissolved Oxygen (DO)
- Total Oxidized Nitrogen (TON)
- Ammoniacal Nitrogen
- Ammonia
- Potassium
- Phosphate



- Biological Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Total Petroleum Hydrocarbons (TPH)\*

### 4 WATER CROSSINGS

#### 4.1 Locations

There is one (1) proposed watercourse crossing within the Site as shown on Figure 4.

\* Only during construction phase





Figure 4.1 Watercourse crossing within the Site.



#### WC1

WC1 is located in the centre of the Site, joining both the northern and southern parcels. The crossing is located at the intersection of the Turpaun stream (order 1)<sup>1</sup> and the Owengar (Leitrim)<sup>2</sup> stream (order 1), subsequently forming the order 2 Owengar (Leitrim)<sup>3</sup>. The crossing will be a bottomless bridge culvert. Details can be seen in **Drawing No. 5969-PL-500**.



Plate 4.1: Approximate location of WC1 (directional shot south-east)



<sup>&</sup>lt;sup>1</sup> Segment Code 26\_4053, EPA Code 26T74

<sup>&</sup>lt;sup>2</sup> Segment Code 26\_4054, EPA Code 26O02

<sup>&</sup>lt;sup>3</sup> Segment Code 26\_4123, EPA Code 26O02

#### **Grid Connection**

Table 4.1 summarises the number of crossings along the Grid Connection Route.

#### Table 4.1: Summary of crossings along the Grid Connection Route

Description	Service Crossings No.	Culvert Crossings No.	Watercourse/bridge Crossings No.
Underground Grid Connection	4	5	7
Total		16	

#### 4.2 Design

The watercourse crossing has been designed on a bespoke basis. The following guidance was used in the sizing of watercourse crossing:

- Hydrological assessments made using a number of methods including Flood Estimation Handbook (Statistical Analysis) and Flood Studies Report (FSR) where appropriate to determine the design flow.
- CIRIA Culvert design and operation guide (C689).
- Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
- Where planning consent is received a Section 50 Application will be submitted to Office of Public Works (OPW) for approval prior to works commencing on site.
- As part of the drainage design, detailed mapping of drainage paths across the site has been undertaken; utilising topographical surveys, contour mapping and aerial photography.

#### 4.2.1 Bottomless Bridge Culvert

The water crossing within the Site will be a bottomless bridge culvert as shown on **Planning Drawing 5969-PL-500.** 

- The bottomless bridge culvert design is nominally segmented precast arch or similar and will avoid permanent disruption to the stream bed and banks, protecting fishery habitats.
- The crossing detailed design is to allow for the passage of out-of-bank flood flows.
- The crossing location site has been informed by the hydrological analysis and identification of constraints to:



- Be located in an area where bank slopes are shallow, thus reducing the potential for runoff to carry sediment into the watercourse.
- Be located so as not to coincide with any incoming tributary streams.
- The structure will include ledges or areas of undisturbed riverbank to allow for the free passage of otters.

#### 4.3 Construction Requirements

The Ecological Clerk of Works (Ecological Clerk of Works) will be consulted with regard to all watercourse crossing works. Surveys by the Ecological Clerk of Works will be carried out immediately prior to construction so that adequate mitigation is built into the design in respect to fish passage and avoiding impact on downstream ecology.

Following consultation with the Contractors, Ecological Clerk of Works and third parties, Leitrim County Council will be frequently consulted during watercourse crossing construction, as agreed prior to the commencement of construction.

#### 4.4 Mitigation Measures

Suspended solid pollution will be avoided by use of a bottomless bridge culvert. Where a Bottomless Bridge Culvert is installed, its construction will follow IFI (2016) for works in or adjacent to watercourses.

Mitigation will include protection of the riparian bank structure, minimisation of sedimentation to the watercourse by use of silt fencing, sandbags or other sediment reducing measures, and minimisation of instream activity.

The following mitigation is proposed and is in line with IFI (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters, in particular Section 6 – River and Stream Permanent Crossing Structures.

During the construction phase the appointed Contractor(s) shall ensure that:

- No works will take place within the 50m buffer zone of watercourses except for the bottomless bridge culvert, road development and drainage measures as detailed.
- Site compounds and temporary excavation areas will be located at a minimum distance of 50m from any watercourse. All drainage from these facilities will be directed through a settlement pond with appropriate capacity and measures to provide spill containment.



- All site drainage, as described in the **Management Plan 3: Surface Water Management Plan** and shown on associated drawings, will be directed through either sediment traps, settlement ponds and / or buffered drainage outfalls to ensure that total suspended solid levels in all waters discharging to any watercourse will not exceed 25mg/l (IFI, 2016). All construction site run-off will be channelled through a stilling process to allow suspended solids to settle out and through a spill-containment facility prior to discharge.
- Daily monitoring of all sediment traps and settlement ponds will be undertaken by the Ecological Clerk of Works to ensure satisfactory operation and/or maintenance requirements.
- The storage of oils, hydraulic fluids, etc., will be undertaken in accordance with current best practice for oil storage (Enterprise Ireland, BPGCS005).
- All machinery operating at the Site will be fully maintained and routinely checked to ensure no leakage of oils or lubricants occurs. All fuelling of machinery will be undertaken at a discrete "fuel station" designated for the purpose of safe fuel storage and fuel transfer to vehicles.
- Any extensions to existing drainage culverts on the site roads will be undertaken in dry conditions and in low flow conditions on drains that do not run dry.
- The pouring of concrete, sealing of joints, application of water-proofing paint or protective systems, curing agents, etc., will be completed in the dry to avoid pollution of the freshwater environment (see **Chapter 9: Hydrology and Hydrogeology** for further details). There will be no batching or storage of cement allowed in the vicinity of any watercourse crossing construction area.
- Procedures (as detailed in **Chapter 9: Hydrology and Hydrogeology**) will be put in place to ensure the full control of raw or uncured waste concrete to ensure that watercourses will not be impacted.
- Should there be any incidents of pollution to watercourses, immediate steps as specified in the **Emergency Response Plan** (CEMP-Management Plan 1) will be undertaken to resolve the cause of the pollution and where feasible, mitigate against the impact of pollution.
- Re-seeding / re-vegetation of all areas of bare ground or the placement of Geojute (or similar) matting will take place prior to the start of the operational phase to prevent silt-laden run-off. The seed mix will contain only suitable native species of plant.



- Silt traps erected during the construction phase within roadside and artificial drainage will be replaced with stone check dams for the lifetime of the project.
- Silt traps erected during the construction phase within roadside and artificial drainage will be replaced with stone check dams for the lifetime of the project. These stone check dams will only be placed within artificial drainage systems such as roadside drains and not in natural streams or drainage lines.
- A full review of construction stage temporary drainage will be undertaken by the Developer (in conjunction with the Project Hydrologist/ Site Engineer and the Project Ecologist) following the completion of construction, and drainage removed or appropriately blocked where this will not interfere with infrastructure.

