
CARRAIGIN POWER LTD

**CARRIGEEN RENEWABLE ENERGY
DEVELOPMENT, COUNTY ROSCOMMON**

**CONSTRUCTION ENVIRONMENTAL
MANAGEMENT PLAN
(CEMP)**

**MANAGEMENT PLAN 2
WATER QUALITY MANAGEMENT PLAN**

March 2026

Carraigin Power Ltd
Lissarda Business Park,
Lissarda,
Cork,
Ireland



Jennings O'Donovan & Partners Limited,
Consulting Engineers,
Finisklin Business Park,
Sligo.
Tel.: 071 9161416
Fax: 071 9161080
email: info@jodireland.com



JENNINGS O'DONOVAN & PARTNERS LIMITED



Project, Civil and Structural Consulting Engineers,
FINISKLIN BUSINESS PARK,
SLIGO,
IRELAND.

Telephone (071) 9161416
Fax (071) 9161080
Email info@jodireland.com
Web Site www.jodireland.com



DOCUMENT APPROVAL

PROJECT	Carrigeen Renewable Energy Development	
CLIENT / JOB NO	Carraigin Power Ltd	6575
DOCUMENT TITLE	Construction Environmental Management Plan (CEMP) Water Quality Management Plan (WQMP)	

Prepared by		Reviewed/Approved by
Document Final	Name Kathlyn Feeney	Name Ciara Gilligan
Date March 2026	Signature 	Signature 

This document, and information or advice which it contains, is provided by JENNINGS O'DONOVAN & PARTNERS LIMITED solely for internal use and reliance by its Client in performance of JENNINGS O'DONOVAN & PARTNERS LIMITED's duties and liabilities under its contract with the Client. Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole. The advice and opinions in this document are based upon the information made available to JENNINGS O'DONOVAN & PARTNERS LIMITED at the date of this document and on current standards, codes, technology and construction practices as at the date of this document. Following final delivery of this document to the Client, JENNINGS O'DONOVAN & PARTNERS LIMITED will have no further obligations or duty to advise the Client on any matters, including development affecting the information or advice provided in this document. This document has been prepared by JENNINGS O'DONOVAN & PARTNERS LIMITED in their professional capacity as Consulting Engineers. The contents of the document does not, in any way, purport to include any manner of legal advice or opinion. This document is prepared in accordance with the terms and conditions of JENNINGS O'DONOVAN & PARTNERS LIMITED contract with the Client. Regard should be had to those terms and conditions when considering and/or placing any reliance on this document. Should the Client wish to release this document to a Third Party for that party's reliance, JENNINGS O'DONOVAN & PARTNERS LIMITED may, at its discretion, agree to such release provided that:

- (a) JENNINGS O'DONOVAN & PARTNERS LIMITED written agreement is obtained prior to such release, and
- (b) By release of the document to the Third Party, that Third Party does not acquire any rights, contractual or otherwise, whatsoever against JENNINGS O'DONOVAN & PARTNERS LIMITED and JENNINGS O'DONOVAN & PARTNERS LIMITED, accordingly, assume no duties, liabilities or obligations to that Third Party, and
- (c) JENNINGS O'DONOVAN & PARTNERS LIMITED accepts no responsibility for any loss or damage incurred by the Client or for any conflict of JENNINGS O'DONOVAN & PARTNERS LIMITED's interests arising out of the Client's release of this document to the Third Party.

Directors
Nigel Board, Abigail Draper,
David Kiely, Seamus Lee,
David O'Hagan, Alan Ryder

Chief Finance Officer
Rose Davis

Technical Directors
Joe Healy, Sean Molloy

Regional Director
Audrey Phelan

Senior Associates
Seán Gilmartin, John McElvaney, Tomás McGloin

Associates
Breana Coyle, Dermot Guilfoyle, Lindsey McCormack,
Sarah Moore, Cáit O'Reilly



CONTENTS

1. INTRODUCTION.....	1
1.1 Scope and Requirements.....	1
1.2 Reference Documentation.....	1
2. RESPONSIBILITIES.....	2
2.1 General.....	2
2.2 Hydrochemistry Monitoring.....	3
2.3 Reporting.....	4
2.4 Contingency Sampling & Emergency Response.....	5
3. WATER QUALITY MONITORING: OUTLINE SCOPE.....	5
3.1 General.....	5
3.2 Monitoring Frequency.....	6
3.3 Hydrochemistry Monitoring.....	6

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 the Wind Farm 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 the Wind Farm Site, and specifically construction works to be undertaken within 50m of any major watercourse or 10m for any minor watercourse, will be completed in compliance with current legislation and best practice as detailed within this CEMP and in particular the **Spoil Management Plan (MP4)** and the **Surface Water Management Plan (MP3)**.

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.

- Carrigeen Renewable Energy Development, Co. Roscommon Environmental Impact Assessment Report (EIAR), March 2026
- Carrigeen Renewable Energy Development, Co. Roscommon Natura Impact Statement (NIS), March 2026
- Carrigeen Renewable Energy Development, Co. Roscommon CEMP, March 2026

2. RESPONSIBILITIES

2.1 General

2.1.1 Responsibility for the water quality monitoring programme, and coordination thereof, will lie with the independent site Environmental Manager appointed at the start of the programme.

2.1.2 Prior to works commencing, the site Environmental Manager will be retained by Enerco Energy Limited 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 the site Environmental Manager at the beginning of each week.

2.1.3 The site 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 site 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 site 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 tracks 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 tracks (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 track 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 major watercourse crossings) before, during (if potential pollution visually identified) and after construction works at that location

- EPA Q Value Biological Monitoring at three 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 site Environmental Manager. The site 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 site Environmental Manager. 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 site Environmental Manager. Samples will be dispatched for analysis under chain of custody procedures. Laboratory analytical results will be sent directly to the site Environmental Manager

2.2.4 Interpretation and reporting of both the field and laboratory data will be the responsibility of the site Environmental Manager.

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 the Wind Farm Site. A monthly report on water quality will be prepared by the site Environmental Manager.

2.3.2 It will be the responsibility of the site Environmental Manager 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 site Environmental Manager.

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 Roscommon City and County Council and Inland Fisheries Ireland on request.

2.3.5 Final Report on Water Quality

Upon completion of all post-construction monitoring, the site Environmental Manager 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.

2.3.7 The final report will be provided to Roscommon City and 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.

Where a pollution incident has occurred as a result of construction works, the site Environmental Manager and The Local Authority 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 (MP1)**

- 2.4.2** The results of any monitoring or survey work undertaken by the Contractor will be made available to the site Environmental Manager and the Local Authority. Copies of all correspondence and test certificates will be retained on the Wind Farm 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. The baseline water quality monitoring stations are outlined in **EIAR Figure 11.7**.
- 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.
- 3.1.6** Water quality monitoring locations will include both upstream and downstream points relative to the works locations. The locations of the water quality monitoring points will be flexible and will be moved as the construction phase progresses so that monitoring points remain representative of the most likely construction impact receptor points;
- 3.1.7** The downstream monitoring locations will be positioned as close as possible downstream of the works location and another positioned further downstream. This approach will allow for an assessment of the dilution of potential contaminations (if present) as the distance from the point of diffuse source location increases.
- 3.1.8** Watercourses which do not have year-round flows such as artificial drains, ditches or ephemeral streams will be avoided as water quality monitoring locations.

3.2 Monitoring Frequency

- 3.2.1** Monitoring frequency will be specified and agreed with Inland Fisheries Ireland and Roscommon City and County Council prior to commencement of construction.
- 3.2.2** As a minimum, the monitoring programme will include:
- Daily visual checks across the construction works area;
 - Weekly grab sampling for suspended solids and turbidity in catchments where construction is on-going and monthly monitoring for all other parameters;
 - Event based sampling, e.g. after heavy rainfall (at least **4** no. event-based monitoring rounds per year);
 - Additional sampling in the event of trigger level exceedance, e.g. after heavy rainfall; and,
 - Post construction sampling programme (monthly sampling for 3 months).

3.3 Hydrochemistry Monitoring

- 3.2.3** Sample locations, monitoring frequency and precise hydrochemistry parameters will be

agreed in writing with Roscommon City and County Council and Inland Fisheries Ireland, prior to commencement of construction, and following consultation with Inland Fisheries Ireland.

3.2.4 As a minimum, the monitoring programme will include:

- During the construction phase, daily visual inspections of excavations, dewatering procedure, settlement ponds, silt traps, buffered outfalls and drainage channels etc. will be carried out by a suitably qualified person. Any excess build-up of sediment at settlement ponds, drains or at any other drainage features that may decrease the effectiveness of the drainage feature will be promptly removed;
- During the construction phase of the Project, all development areas will be monitored on a daily basis for evidence of groundwater seepage, water ponding and wetting of previously dry spots;
- Following the completion of the construction phase, silt traps, buffered outfalls and drainage channels will be periodically inspected during maintenance visits to the Wind Farm Site when the operational phase water quality monitoring will also be carried out;
- Any proposed crossings of small unmapped drains will be monitored daily during construction and during each Wind Farm Site visit during the operational phase. These small culvert crossings will be monitored in terms of their impacts (if any) on the receiving watercourses and in terms of their structural integrity to identify any signs of erosion or potential for sediment release;
- It is proposed that a handheld turbidity meter is available at the Wind Farm Site to accurately measure the quality of water discharging from the Wind Farm Site. The meter will be maintained and calibrated before each use by a qualified site Environmental Manager; and,
- Any discharges of sediment treated water should meet the requirements of the *Surface Water Regulations 2009*, as amended.

3.2.4.1 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.

3.2.4.2 Weekly visual inspections and monthly field hydrochemistry monitoring.

3.2.4.3 One round of post construction monitoring, to be agreed with Roscommon City and County Council. Post construction will be defined as when the reinstatement phase is completed.

3.2.5 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
- Electrical Conductivity
- Temperature
- Ortho-Phosphate
- Biological Oxygen Demand
- Sulphate
- Chloride
- Ammoniacal Nitrogen
- Ammonia
- Nitrite
- Nitrate
- Total Petroleum Hydrocarbons
- Total Suspended Solids
- Turbidity