MKO Planning and Environmental Consultants

Remedial Natura Impact Statement

Substitute Consent for Deviations at Meenbog Windfarm, Co. Donegal

DOCUMENT DETAILS

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Planning and Environmental Consultants

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1. INTRODUCTION

1.1 Background

MKO has been appointed to provide the information necessary to allow the competent authority to conduct a remedial Article 6(3) Appropriate Assessment of 25 deviations from the windfarm permitted under ABP-3000460-17 (amended by ABP-303729-19) (the Permitted Development). These deviations are collectively referred to hereafter as the Subject Development.

Screening for Appropriate Assessment is required under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). Where it cannot be excluded that a project or plan, either alone or in combination with other projects or plans, would have a significant effect on a European Site then same shall be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives. The Subject Development is not directly connected with, or necessary for, the management of any European Site. Consequently, the Subject Development is subject to the Appropriate Assessment Screening process. In this case, the precautionary principle has been followed and a Natura Impact Statement is provided that will provide the competent authority with the information required to undertake an Appropriate Assessment.

This Remedial Natura Impact Statement (rNIS) has been prepared in accordance with the European Commission's Assessment of Plans and Projects Significantly affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC (EC, 2021) and Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2018) as well as the Department of the Environment's Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DoEHLG, 2010) and the Appropriate Assessment Screening for Development Management. Office of the Planning Regulator, Dublin 7, Ireland OPR (2021).

1.2 Statement of Authority

This assessment was undertaken by Pat Roberts (BSc.) Env. MCIEEM. Pat is a full member of the Chartered Institute of Ecology and Environmental Management. Pat is highly experienced in the undertaking of Ecological Impact Assessments and Habitats Directive Assessments and has over 18 years' post graduate experience in ecological consultancy.

1.3 Structure and Format of this Document

- Section Two provides a full description of all elements of the Subject Development.
- In Section Three, the methodologies for undertaking the surveys that inform this rNIS are provided.
- In Section Four, the characteristics of the receiving environment are fully described.
- In Section Five, a screening process is undertaken to identify any European Sites upon which there is a potential for a likely significant effect have occurred or to occur either individually or in combination with other plans and projects as a result of the Subject Development.
- Section Six provides a detailed consideration of the relevant European Sites and identifies the qualifying features for which a complete source -pathway- receptor chain exists and how they could potentially be affected or have been affected in light of their conservation objectives.
- Section Seven provides an assessment of the potential for adverse effects to occur or have occurred on the relevant European Sites as a result of the Subject

Development in the absence of mitigation. This section also prescribes mitigation to robustly block any identified pathways for effect.

- Section Eight provides an assessment of residual effects taking into consideration the mitigation.
- In Section Nine, the potential in combination effects of the Subject Development on European Sites, when considered in combination with other plans and projects were assessed.
- A concluding statement is provided in Section Ten.

2. DESCRIPTION OF SUBJECT DEVELOPMENT

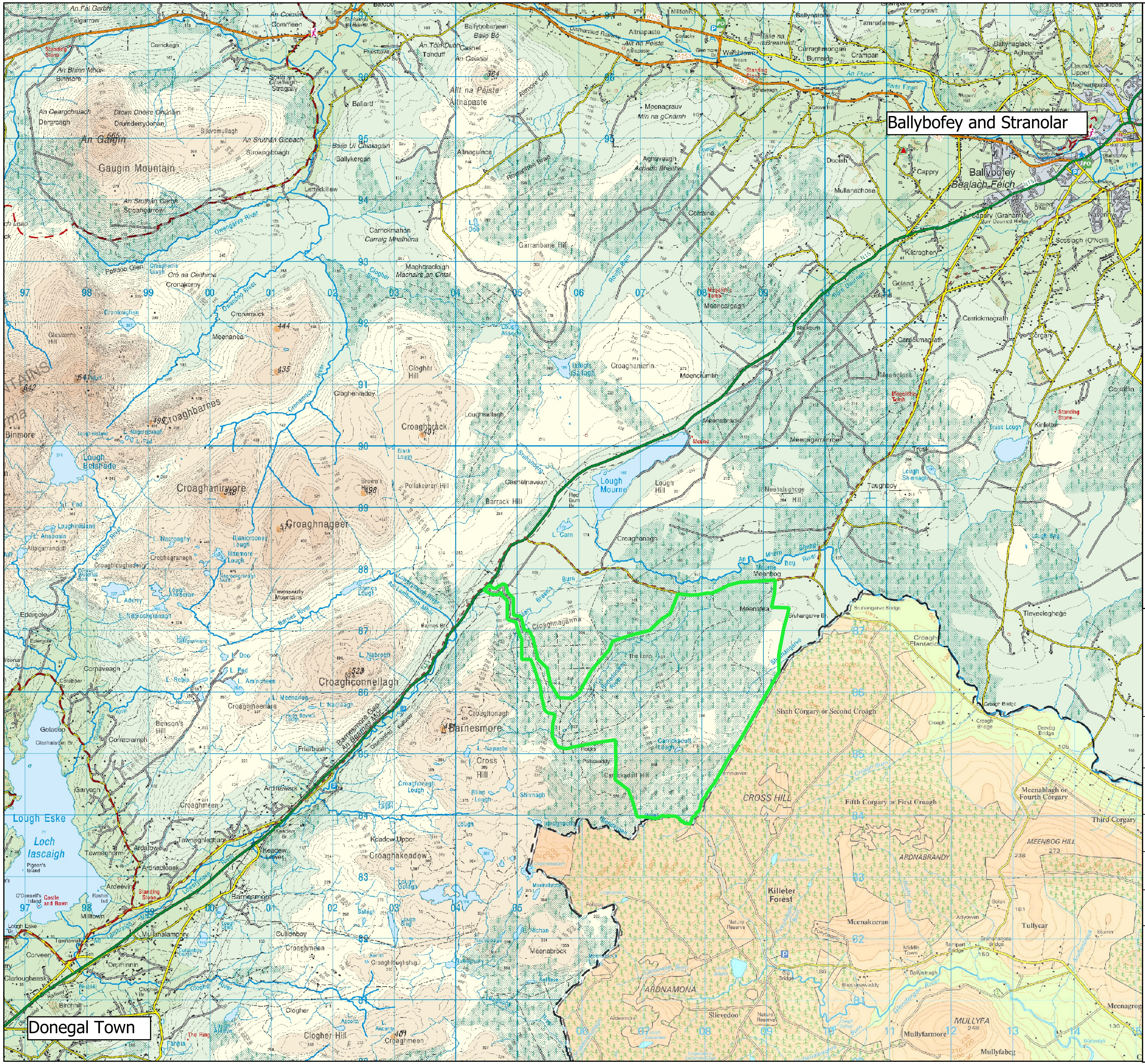
2.1 Site Location

The primary study area of this rNIS is approximately 903 hectares in extent and is located approximately 8km southwest of the twin towns of Ballybofey and Stranorlar and approximately 12km northeast of Donegal Town. The Site location is shown in Figure 2-1.

Current land-use on the Site is comprised of the partially constructed Meenbog Windfarm, areas of commercial forestry and blanket bog. Construction of the Meenbog Windfarm commenced in November 2019, with approximately 90% of the civil engineering works, including wind farm access roads, 110kVelectrical substation, turbine hardstands, turbine foundations, and ancillary works substantially completed over the following 12-month period up to November 2020.The Subject Development has a footprint of approximately 8.8ha. The location of the deviations are shown in Figure 2-2.

2.2 Characteristics of the Subject Development

The Subject Development for which substitute consent is being sought is described in Table 2-1 below. A map showing the layout of the Subject Development is provided in Figure 2-2 below.



Map Legend

rEIAR Study Area

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Drawing Title	Site Location
Project Title	remedial Natura Impact Statement
Drawn By: MT	Checked By: TB
Project No.: 220623	Drawing No.: Figure 2-1
Scale: 1:60,000	Date: 2024-03-04

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Map Legend

- rEIAR Study Area
- Subject Development Footprint
- Permitted Development Footprint
- Permitted Development Turbine Locations

Drawing Title

Subject Development Layout

Project Title

remedial Natura Impact Statement

Drawn By	Checked By
MT	TB
Project No.	**Drawing No.**
220623	Figure 2-2
Scale	**Date**
1:17,000	2024-03-29

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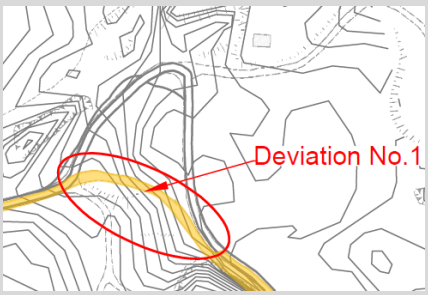
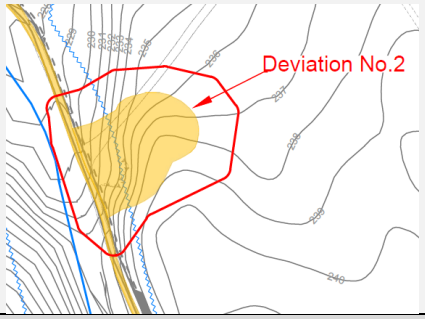
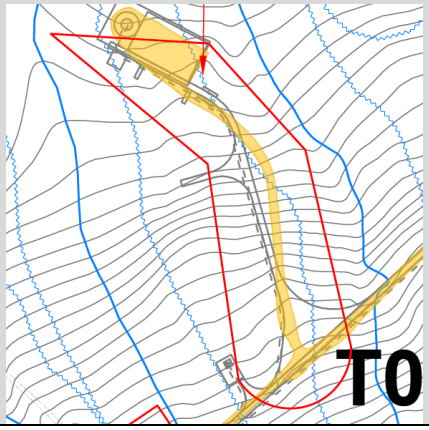
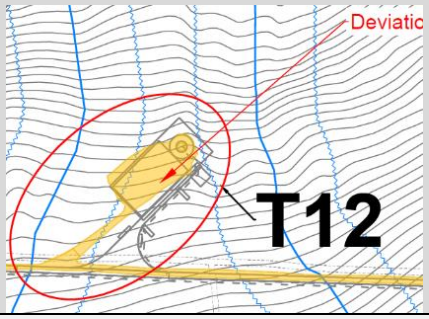
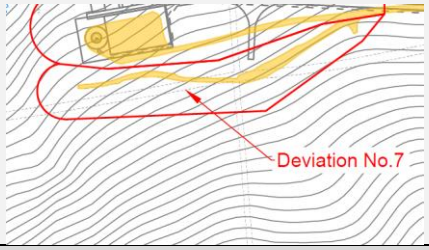
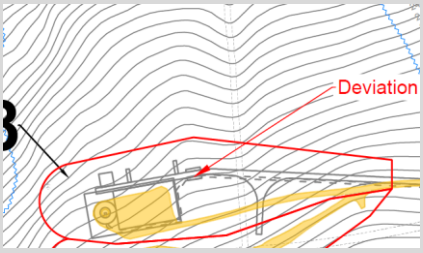
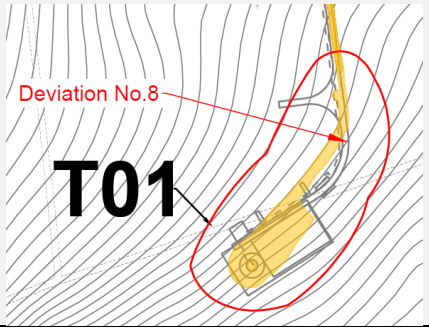
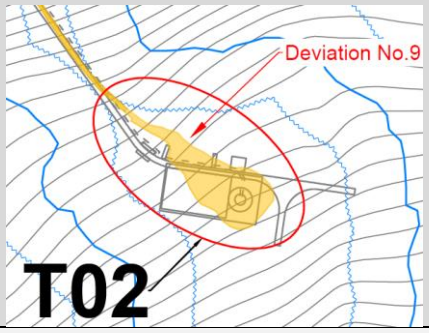
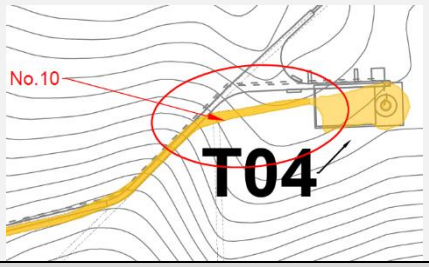
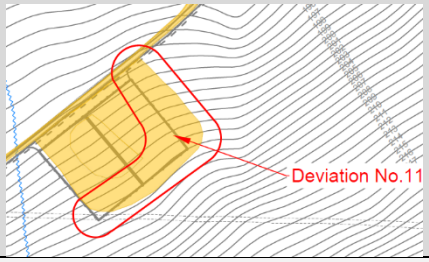
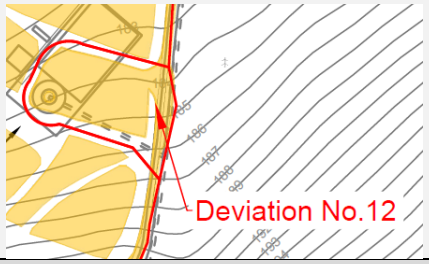
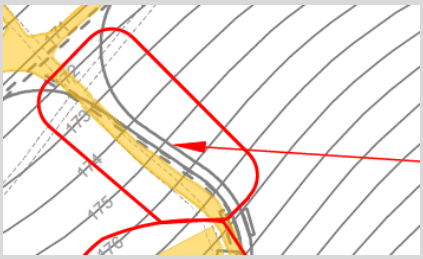
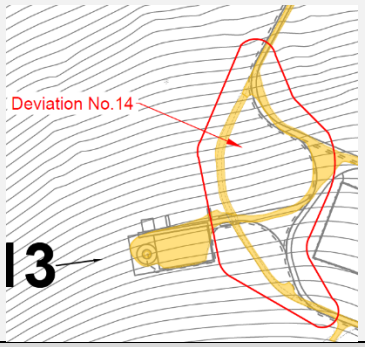
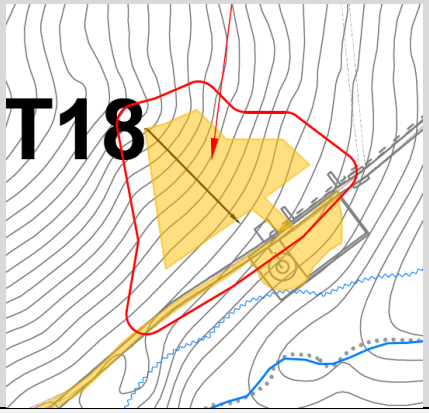
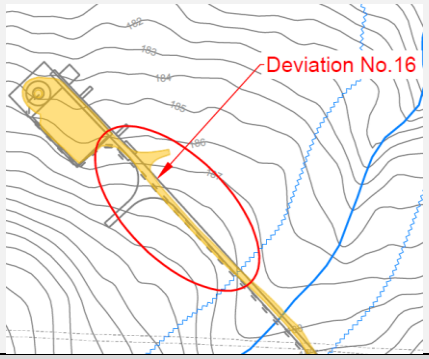
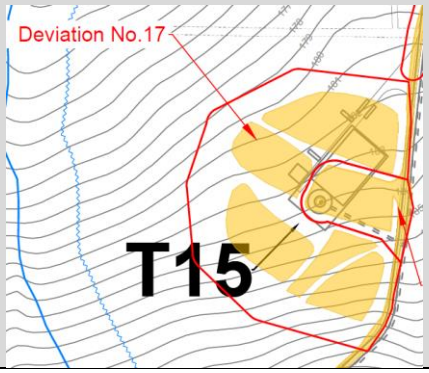
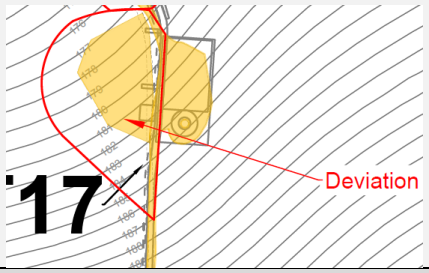
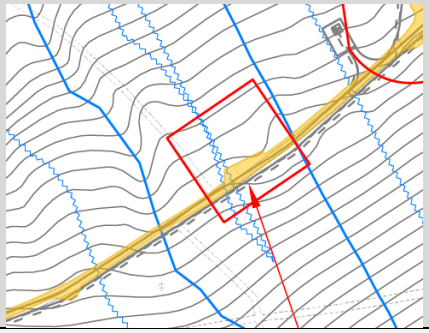
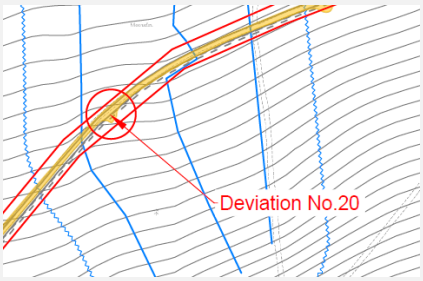
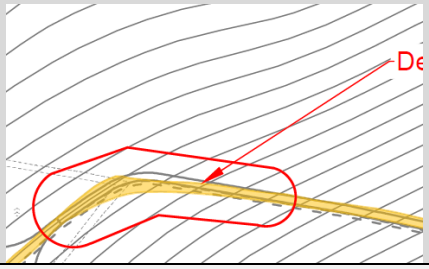
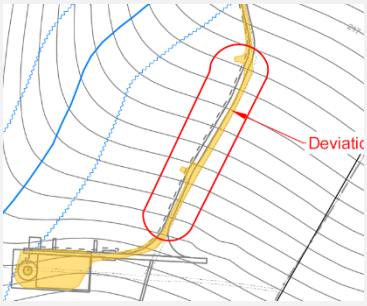
Table 2-1 Alternations to the Permitted Development that are subject to the application for leave to apply for substitute consent

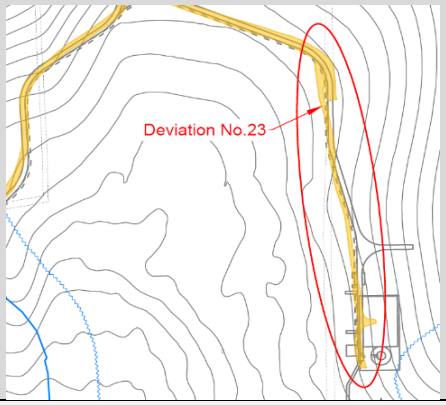
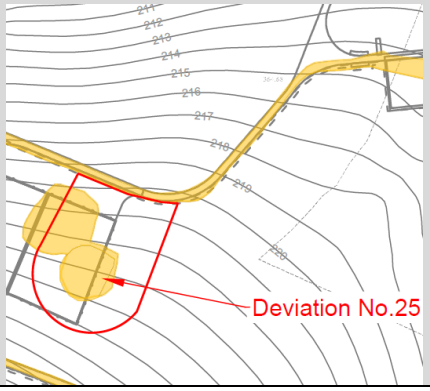
No.	Deviation Description	Location of Deviation	Reason for Deviation
1	Entrance road off N15 (the hairpin bend)		The existing hairpin bend was unsafe as it did not provide adequate line of sight for vehicles using the road. This was a safety concern that only came to light prior to construction and after it was established that the as-built route was feasible from a geotechnical perspective with the benefit of site investigations. The as-built alignment would have required a reduced construction footprint compared to the permitted.
2	Peat cell southeast of substation		Peat cells were created as part of the engineering plans for excess peat that was generated during the course of construction and required management, greater than the volumes estimated pre-construction.
3	T10 access road:		Realigned road was adjusted to follow more favourable ground conditions and topography.

4	Borrow Pit southwest of T12		Existing forestry borrow pit was expanded to win stone on-site ahead of gaining access to the wind farm borrow pits. Excavation of the existing forestry borrow pit continued in lieu of excavation at the permitted BP1 borrow pit.
5	T12 access road		The natural topography on site required a slight realignment of the approach to T12 due to rising ground to the east of the planned road. Moving the road approximately 30 metres to the west negated the need for excessive cut at this location.
6	Peat containment berm near T8		A berm was constructed to the south of T8 as a peat containment safety measure prior to constructing T8.
7	T8 access road (see 6 further above for peat containment berm)		The access road to T8 was amended to approach the southern side of the turbine and align with the berm.
8	T1 access road		The approach to T1 was slightly amended to provide a more effective alignment for delivery vehicles based on detailed design of road alignment pre-construction.

9	T2 access road		The approach to T2 was slightly amended to provide a more effective alignment for delivery vehicles based on detailed design of road alignment pre-construction.
10	T4 access road		The approach to T4 was slightly amended to provide a more effective alignment for delivery vehicles based on detailed design of road alignment pre-construction.
11	Borrow pit (BP2) south of T15		Permitted borrow pit was expanded slightly to win more rock on-site.
12	T15 hardstand and access road		The natural topography on site facilitated direct access to T15 off the main spine road at this location which negated the need for the proposed road to T15. This was achieved by rotating the hardstand by 90 degrees.
13	T17 access road		The permitted road followed the route of a pre-existing forestry firebreak, and the as-built road was constructed as intended, along that firebreak. The intent was clear, but a minor difference in alignment arose between the permitted road and as-built road.

14	T13 road alignment (upgrade of existing forestry track)		An existing road alignment was upgraded and used, thus preventing the need for the construction of the section of new permitted road based on detailed design of road alignment pre-construction.
15	Peat cells NW of T18		Peat cells were created as part of the engineering plans for excess peat that was generated during the course of construction and required management, greater than the volumes estimated pre-construction.
16	T14 turning head		Position of turning head altered to suit the natural topography on the ground.
17	Peat cells near T15		Peat cells were created as part of the engineering plans for excess peat that was generated during the course of construction and required management, greater than the volumes estimated pre-construction.

18	Peat cells near T17		Peat cell was created as part of the engineering plans for excess peat that was generated during the course of construction and required management, greater than the volumes estimated pre-construction.
19	Layby south of T10 with welfare facilities		This was an existing forestry access for harvesting, which was repurposed for locating site office and welfare facilities, which will be removed upon completion of construction.
20	Layby northeast of T15		Layby in this area installed as a safety measure to allow construction traffic to pass. It is along the original permitted road alignment to T15. Passing bays were included in the planning drawings though actual location on the ground may have varied as conditions dictated.
21	T19 access road		Slight widening and curve realignment to increase horizontal bend radius for turbine blade delivery.
22	T9 access road		The permitted road followed the route of a pre-existing forestry track, and the as-built road was constructed as intended, along that forestry track. The intent was clear, but a minor difference in alignment arose between the permitted road and as-built road.

23	Additional storage area and access road to T7		The realigned road served the dual purpose of acting as a peat containment berm following the November 2020 peat failure.
24	Roadside berms and settlement ponds		Small, low-level roadside berms were used to contain mud within the road corridor surface and prevent run-off into the wind farm drainage system or settlement ponds, check dams and silt fences. Settlement ponds are entirely consistent with the permitted wind farm's drainage design, but wouldn't have been shown on planning drawings and therefore may appear to have been outside the Permitted Development footprint.
25	Assessment of additional excavated borrow pit and peat storage cell at T-13		Position of permitted borrow pit was repositioned to suit local topography.

2.2.1 Overview

The components of the Subject Development are broadly grouped into the following categories:

- Site Roads and Hardstand Areas
- Borrow Pits
- Peat and Spoil Management
- Environmental and Water Quality Mitigation Measures

2.2.1.1 Site Roads and Hardstand Areas

A total of 16 no. deviations relate to the realignment of consented site roads and hardstand areas, including laybys, hardstand orientations and turning heads. Deviation No. 1 relates to the realignment of the main wind farm access road near the main Site entrance from the N15 National Road. Deviations Nos. 3, 5, 7, 8, 9, 10, 13, 14, 21, 22, and 23 relate to the realignment of internal turbine

access roads. Deviation No. 16 relates to the relocation of a turning head and deviation Nos. 19 and 20. relates to the provision of laybys. Deviation No. 12 relates to an alteration of the orientation of the consented hardstand at T15.

2.2.1.2 Main Site Access Road Realignment

Deviation No.1 concerns the entrance road off N15 (the hairpin bend). The ITM Coordinates are 604694.726 E, 887626.481N. Works were carried out to construct a bypass access link here in lieu of upgrading the existing hairpin bend access road. This provides a safer and more sensible approach to the Site by eliminating a sharp, blind bend in the main entrance road to the Site. The deviation added approximately 60m of new access road built to solid formation, instead of upgrading and significantly widening an existing road with a length of 190m on a more difficult alignment. Furthermore, the longer blades authorised by the S.146B process in June 2019 can be more easily accommodated on the as-built road by eliminating the need to traverse the hairpin bend.

2.2.1.3 Turbine Access Road Realignment, Layby Provision and Turning Head Modifications.

Deviations Nos. 3, 5, 7, 8, 9, 10, 13, 14, 21, 22, and 23 relate to minor realignment of internal turbine access roads. Deviation No. 16 relates to the relocation of a turning head and deviation No. 20 relates to the provision of a layby. The realignment of the access roads and the relocation of the turning head was in response to conditions on the ground and detailed design of road alignment pre-construction. The layby in deviation 20 was installed as a safety measure to allow construction traffic to pass. Information on the location of each of these deviations is provided in Table 3-1.
Deviation No. 19 consists of an existing forestry access for harvesting, which was repurposed for locating site office and welfare facilities. These facilities will be removed upon completion of construction.

2.2.1.4 Reorientation of Hardstand

Deviation No. 12 relates to an alteration of the orientation of the consented hardstand at T15. The natural topography on Site facilitated direct access to T15 off the main spine road at this location which negated the need for the proposed access road to T15. This was achieved by rotating the hardstand by 90 degrees.

2.2.2 Borrow Pits

Deviation Nos. 4, 11, and 25 relate to borrow pits that were constructed in either a different location than on planning drawings (Deviation No.4) or that extended beyond the consented boundary as shown in the planning drawings for the Permitted Development.

2.2.2.1 **Borrow Pit South of Turbine 12**

Deviation No. 4 concerns the borrow pit southwest of T12. The ITM Coordinates are 607214.436E, 885893.880N. An existing forestry borrow pit was expanded to win stone on-site ahead of gaining access to the wind farm borrow pits. Excavation of the existing forestry borrow pit continued in lieu of excavation at the permitted BP1 borrow pit which was not used due to peat stability concerns. Following the completion of rock extraction, the borrow pit was subsequently partially restored by backfilling with peat from elsewhere on the Site. This was consistent with the consented construction methodology for borrow pits. Restoration was accomplished by creating a cell to store excavated peat with a berm constructed along the downslope (north-west) edge of the borrow pit. The borrow pit is bounded to the west and north by internal access roads which are constructed to solid formation. A Cross section of the borrow pit is provided as Figure 2.1 below.

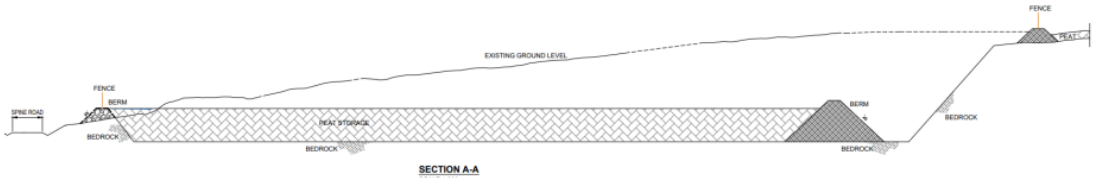


Figure 2-1 Cross Section of Borrow Pit South of Turbine 12

Since the cessation of peat deposition, the surface of the deposited peat has revegetated with peatland species including soft rush (*Juncus effusus*), bulbous rush (*Juncus bulbosus*), Yorkshire fog (*Holcus lanatus*) and tormentil (*Potentilla erecta*). Some ling (*Calluna vulgaris*), *Polytrichum* and *Sphagnum* species are also present. Upon recommencement of works, the currently unfilled portion of the borrow pit will be backfilled with peat and allowed to revegetate.

2.2.2.2 Borrow Pit South of Turbine 15

Deviation No. 11 concerns the consented borrow pit 2 south of T15. Borrow pit 2 (also referred to Borrow Pit A in the planning documents) is located south of T15 and adjacent to an internal wind farm access road. The borrow pit was excavated into existing ground, commencing at the southern end of the borrow pit.

This borrow pit was indicated on the planning drawings for the Permitted Development but has been expanded slightly beyond the originally illustrated footprint. A Cross section of the borrow pit is provided as Figure 2-2 below.

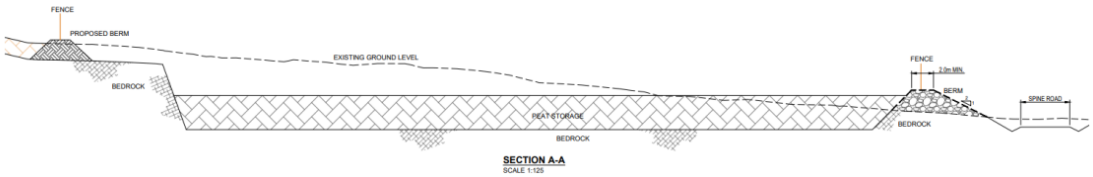


Figure 2-2 Cross Section of Borrow Pit South of Turbine 15).

Since the cessation of peat deposition in the borrow pit, the surface of the deposited peat has begun to revegetate with species including soft rush (*Juncus effusus*), Yorkshire fog (*Holcus lanatus*), creeping bent grass (*Agrostis stolonifera*) and tormentil (*Potentilla erecta*). Upon recommencement of works, the currently unfilled portion of the borrow pit will backfilled with peat and allowed to revegetate

2.2.2.3 Borrow Pit between Turbine 13 and Turbine 16

Deviation No. 25 concerns the consented borrow pit 3 and peat storage cells/ borrow pit backfilling. The consented borrow pit was slightly repositioned to suit local topography. Borrow pit 3 is located between T13 and T16. Two pits were excavated on the eastern side of the borrow pit area and these were subsequently used to store excavated peat in accordance with the approved construction methodology for borrow pits. The remainder of the consented borrow pit has not been completed to date, however will be completed in accordance with the plans for the Permitted Development. A Cross section of the borrow pit is provided as Figure 2-3 below.

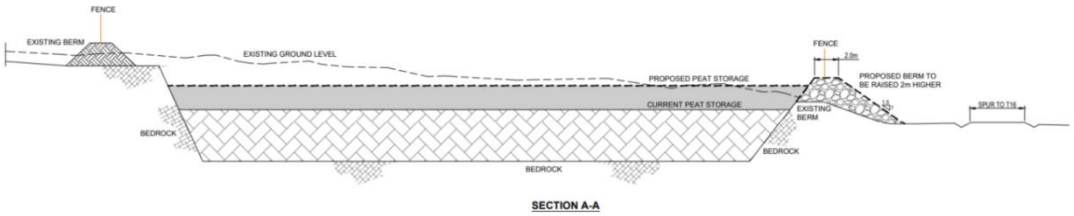


Figure 2-3 Cross Section of borrow pit between Turbine 13 and Turbine 16

Since the cessation of peat deposition at this partially constructed borrow pit, the surface of the deposited peat has revegetated with species including soft rush (*Juncus effusus*) and bulbous rush (*Juncus bulbosus*), which are dominant throughout. Upon recommencement of works, this borrow pit will be completed and will be backfilled with peat and allowed to revegetate.

2.2.3 Peat and Spoil Management

2.2.3.1 Peat Storage Cells

Deviations Nos. 2, 15, 17 and 18 are comprised of engineered peat storage cells. The peat cell at Deviation No. 15 has not yet been backfilled with peat. Upon recommencement of works, the prepared peat cell will be completed, backfilled with peat and allowed to revegetate. Peat storage cells were excavated to a competent stratum and retaining berms constructed prior to being filled with peat. A cross section of a peat cell retaining berm is provided as Figure 2-4, below.

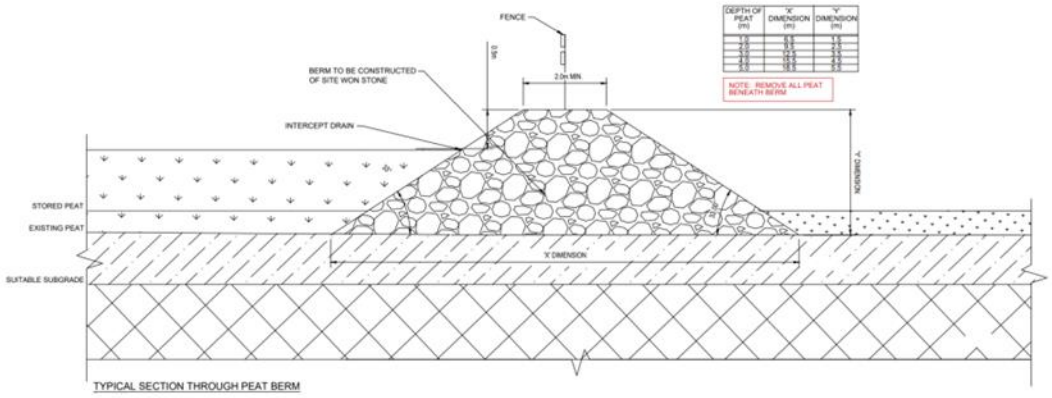


Figure 2-4 Cross-Section of a Peat Cell retaining Berm

2.2.3.2 Peat Containment Berm

Deviation No. 6 concerns a berm which was constructed to the south of T8 as a peat containment safety measure prior to constructing T8. The berm was extended from stable ground on the east side and continued to just beyond the turbine foundation at the west side. This berm is located on the uphill side of T8 spur road, hardstand and foundation. The containment berm was constructed in July 2020 in response to a peat movement that occurred upslope from T8, preventing further movement. The ITM coordinates of this deviation are 6072522E, 885562N A Cross section of Deviation 6 is provided as Figure 2-5 below.

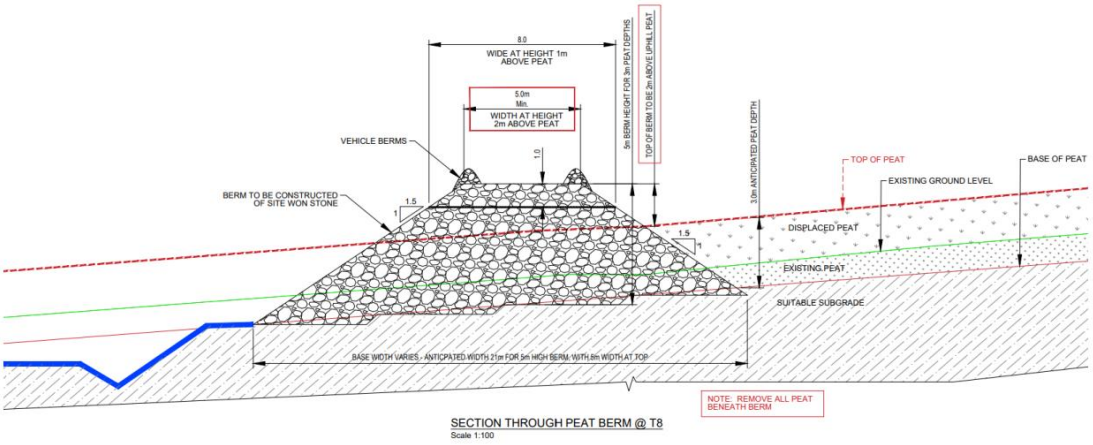


Figure 2-5 Cross Section of Peat Containment Berm

2.2.4 Water Quality Mitigation Measures

Deviation No. 24 consists of roadside berms and settlement ponds that were constructed as part of the Meenbog Windfarm's drainage design for the purpose of protecting water quality. The use of such measures is best practice for sediment and erosion control on construction projects.

2.2.4.1 Roadside Berms

Small, low-level roadside berms were used to contain sediment within the road corridor and prevent run-off into the wind farm drainage system at uncontrolled locations. The construction of these berms ensured that runoff was allowed to access the drainage system only via settlement ponds. The purpose of these measures was to protect water quality.

2.2.4.2 Stilling Ponds

Stilling ponds were constructed to capture silt laden runoff from roads and other wind farm infrastructure and prevent suspended solids from entering surface waters. Stilling ponds are entirely consistent with the Permitted Development's drainage design but the specific locations of the ponds were not shown on planning drawings. The purpose of the stilling ponds is to protect water quality. Stilling ponds were used to attenuate runoff from works areas during the construction phase and will remain in place to handle runoff from roads and hardstanding areas during the operational phase of the wind farm. The purpose of the stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity. Reducing runoff velocity will allow larger particles to settle out in the stilling ponds, before the run-off water is redistributed as diffuse sheet flow downgradient of any works areas. Stilling ponds were excavated/constructed on the advice of the project hydrologist.

2.2.5 Site Activities

2.2.5.1 Refuelling

Wherever possible, vehicles were refuelled off-site, particularly for regular road-going vehicles. On-site refuelling of machinery was carried out at designated refuelling areas at various locations throughout the Site. Heavy plant and machinery were refuelled on-site by a fuel truck that came to the Site as required on a scheduled and organised basis. Other refuelling was carried out using mobile double skinned fuel bowser. All refuelling was carried out outside designated watercourse buffer zones. Only designated trained and competent operatives were authorised to refuel plant on-site. Mobile measures such as drip trays and fuel absorbent mats were used during refuelling operations as

required. All plant and machinery were equipped with fuel absorbent material and pads to deal with any event of accidental spillage.

2.2.5.2 Dust Suppression

In periods of extended dry weather, dust suppression was used along haul roads to ensure dust did not cause a nuisance. Water was taken from stilling ponds in the Site's drainage system and was pumped into a bowser or water spreader to dampen down haul roads and temporary construction compounds to prevent the generation of dust. Silty or oily water was not used for dust suppression.

2.2.5.3 Vehicle Washing

Wheels or vehicle underbodies are often washed before leaving sites to prevent the build-up of mud on public (and site) roads. Due to the length of surfaced site roads, vehicle or wheel washing facilities were not required as part of the construction phase of the Meenbog Windfarm. Site roads were formed before road-going trucks begin to make regular or frequent deliveries to the site (e.g. with steel or concrete). The site roads were well finished with compacted hardcore, and so the public road-going vehicles were not travelling over soft or muddy ground where they might pick up mud or dirt.

A road sweeper was available in the event that a section of the public roads was dirtied by trucks associated with the Subject Development.

2.2.6 Waste Management

The Waste Management Act 1996 and its subsequent amendments provide for measures to improve performance in relation to waste management, recycling and recovery. The Act also provides a regulatory framework for meeting higher environmental standards set out by other national and EU legislation.

The Act requires that any waste related activity has to have all necessary licenses and authorisations. It will be the duty of the Waste Manager on the Site to ensure that all contractors hired to remove waste from the Site have valid Waste Collection Permits. It will then be necessary to ensure that the waste is delivered to a licensed or permitted waste facility. The hired waste contractors and subsequent receiving facilities must adhere to the conditions set out in their respective permits/licenses and authorisations.

Prior to the commencement of the development, a Construction Waste Manager was appointed by the Contractor. The Construction Waste Manager was in charge of the implementation of the objectives of the plan, ensuring that all hired waste contractors had the necessary permits/licenses and authorisations and that the waste management hierarchy was adhered to. The Construction Waste Manager had the authority to ensure everyone working on the site adhered to the management plan.

2.2.7 Access and Transportation

2.2.7.1 Site Entrance

Access to the Site is from the west via an existing main site entrance off N15 approximately 8km southwest of Ballybofey. This Site entrance will be used for day-to-day maintenance and monitoring of the Meenbog Windfarm. Construction access for the Subject Development was also via the main Site entrance to the west. There is a secondary Site entrance from Dearg Line Road to the north of the Site. This entrance was used as a staff entrance for workers accessing the northern portion of the Site.

2.2.7.2 Construction Materials Transport Route

All deliveries of construction materials to the Subject Development were by way of the main Site entrance off the N15. The Subject Development did not result in any additional traffic beyond that assessed in the EIAR for the Permitted Development.

2.2.8 Site Drainage

The Site drains into five river sub-basins (Water Framework Directive, 2022). The first river sub-basin is drained from the Site by Mary Breen's Burn, which drains into the Mourne Beg River. The Mourne beg river flows east into River Finn Special Area of Conservation (SAC) and is also part of the Foyle and its Tributaries SAC (Northern Ireland). There are three deviations situated in this subbasin.

The second river sub-basin is drained by the Bunadaowen River, which flows into Mourne Beg River. There are several tributaries and forest drains that drain into Bunadaowen river from the Site. A total of 17 of the subject deviations are located within the Bunadaowen river sub-basin.

The third river sub-basin is drained by the Shruhangarve Stream and a tributary. The Shruhangarve Stream also flows into Mourne Beg River and thus also has a hydrological connection to River Finn/Foyle SACs. There are two deviations located within this sub-basin.

The fourth river sub-basin is drained by a tributary of the Glendergan River, which drain southeast into River Derg in Northern Ireland. The Glendergan River is part of the Foyle and its Tributaries SAC (Northern Ireland). There are three deviations located within this sub-basin.

The fifth river sub-basin is Lowerymore. A tributary of Lowerymore river is adjacent to the Site boundary. Lowerymore ultimately flows into Lough Eske and Ardnamona Wood SAC. There is only one deviation located in this sub-basin.

Prior to the construction of the Meenbog Windfarm, the drainage within the Site comprised of numerous manmade drains that are in place predominately to drain the forestry plantations. This internal forestry drainage pattern is influenced by the local topography, peat cover, layout of the forest plantation and by the pre-existing forestry road network. The forestry plantations, which covered the majority of the Site are generally drained by a network of mound drains which typically run perpendicular to the topographic contours of the Site and feed into collector drains, which discharge to interceptor drains down-gradient of the plantation.

Mound drains and ploughed ribbon drains are generally spaced approximately every 15-20m and 2m respectively. Interceptor drains are generally located up-gradient (cut-off drains) and down-gradient of forestry plantations. Interceptor drains are also located up-gradient of existing forestry access roads. Culverts are located on existing access roads at stream and drain crossings and at low points under access roads which drain runoff onto down-gradient forest plantations.

Prior to the onset of construction works for the Meenbog Windfarm, the drainage management systems were inserted in accordance with the EIAR and CEMP. These drainage systems were inserted around work areas and were integrated with the pre-existing forestry site drainage network described above.
The wind farm development drainage system was designed to mitigate effects on surface watercourses by runoff control and drainage management:

- Firstly, 'clean water is kept clean' by avoiding disturbance to natural drainage features, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations, construction areas and temporary storage areas.
- Secondly, drainage waters from works areas that might carry silt or sediment, and nutrients, are collected and routed towards settlement ponds (or stilling ponds) prior to controlled diffuse release over vegetated surfaces.
- There was no direct discharge from the work areas or from infrastructure footprint to surface waters.
- All runoff from works areas (i.e. dirty water) was attenuated and treated to a high quality prior to being released.

During the construction of the Meenbog Windfarm the drainage management system was extended to encompass the Subject Development. Interceptor drains and stilling ponds were constructed around borrow pits in keeping with the drainage system for the Permitted development to ensure surface water quality was protected.

2.2.9 Construction Management

2.2.9.1 Construction Timing

Construction of the Subject Development began in November 2019 concurrently and in conjunction with the Permitted Development. Construction was timed to commence outside the bird breeding season (1st of March to 31st of August) to avoid any potentially significant effects on nesting birds. Having commenced outside the breeding bird season, construction activities were then ongoing by the time the next bird breeding season came around and continued throughout subsequent bird breeding seasons. Construction of the Meenbog Windfarm continued until November 2020 when all works other than emergency works were halted.

Construction activities relating to the Subject Development were carried out during normal daytime working hours (i.e., 0700 – 1900hrs Monday to Saturday).

2.2.9.2 Construction Sequencing

The construction phase of the Subject Development took place over an approximately 12-month period from November 2019 to November 2020. An approximate timeline for the construction of the various elements that comprise the Subject Development are outlined in Table 2-2 below.

Table 2-2 Indicative Construction Schedule

ID	Task Name	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20
1	Site Preparation Works													
2	Site Roads													
3	Borrow Pits													
4	Silt Ponds													
5	Peat Storage Cells													
6	Roadside Berms													

2.2.10 Construction Phase Monitoring and Oversight

The requirement for a Construction and Environmental Management Plan (CEMP) to be prepared in advance of any construction works commencing on any development site and submitted for agreement to the Planning Authority is now well-established. The proposed procedures for the implementation of the mitigation measures outlined in such a CEMP and their effectiveness and completion was monitored by the Environmental Clerk of Works (ECoW) on behalf of Planree Ltd., in an objective manner. Mitigation measures and construction phase monitoring and oversight was set out in the CEMP for the Meenbog Windfarm.

The provisions of the CEMP applied to the construction of the Subject Development which was constructed as part of the Meenbog Windfarm.

The Contractor, Mid Cork Electrical, was responsible for implementing the mitigation measures specified in the EIAR for the Permitted Development and consolidated in the CEMP. The Contractor was also responsible for ensuring that all construction staff understood the importance of implementing the mitigation measures. The implementation of the mitigation measures was overseen

by the ECoW. with the support of the supervising hydrogeologists, environmental scientists, ecologists or geotechnical engineers, depending on who is best placed to advise on specifical elements of the implementation.

2.2.11 Construction Methodologies

Construction of the Subject Development followed the same construction methodologies as the Permitted Development, the only difference being slight changes to the location of discreet pieces of infrastructure. The construction methodologies followed for the Subject Development are discussed in detail in the following sections.

2.2.11.1 Site Roads and Hardstand Areas

During the initial construction of the Permitted Development, existing forestry tracks were upgraded where possible and new access roads were constructed to provide access within the Site and to connect the wind turbines and associated infrastructure. Crane hardstands were constructed at the base of each of the turbine locations. The parts of the Subject Development that relate to site roads, hardstands, and laybys were constructed using the same methodology as that used for the Permitted Development. The construction methodology for site roads and hardstands at the Meenbog Windfarm is summarised below.

Site roads were constructed to each turbine base and at each base a crane hard standing was constructed to the turbine manufacturer's specifications. Once tree felling was completed, tracked excavators carried out excavation for roads with appropriate equipment attached. The excavations followed a logical route working away from the borrow pit locations. Excavated material was transported back to the borrow pits in haul trucks. Material excavated to create the working area was stored locally for later reuse in backfilling the working area around the turbine foundation. The excavated material was covered with polythene sheets and surrounded by silt fences to ensure sediment-laden run-off did not occur.

When the formation layer was reached, stone from the on-site borrow pit was placed to form the road foundation. The sub grade was compacted with the use of a roller. The final wearing course will not be provided until all bases have been poured. This prevents damage to the wearing course due to stone and concrete trucks movements. The road will be upgraded prior to the arrival of the first turbine. All roads will be maintained for the duration of the operation of the Meenbog Windfarm.

2.2.11.2 Borrow Pits

This methodology applied to the construction of borrow pits comprised with the Subject Development:

- The areas to be used were marked out at the corners using ranging rods or timber posts. Drainage runs and associated stilling ponds were installed around the perimeter;
- Tree felling occurred, where necessary,
- The initial borrow pit excavation involved the removal of peat and overburden from the top of bedrock. These materials were used to form a berm on the downhill side of the borrow pit to provide screening of the borrow pit operations;
- Interceptor drainage ditches were excavated on all sides of the borrow pit to catch surface water runoff, and direct it to downstream re-distribution locations;
- The bedrock material was extracted from the borrow pit and stockpiled or used as required;
- The use of material won from the borrow pit was sequential with new road construction or turbine base formations;

- Temporary stockpiling of aggregates was required to accommodate the cut and fill operations within the borrow pit, and the progression of access roads and turbine excavations;
- As the borrow pit excavations progressed, surface water and groundwater ingress was removed via pumping to settlement ponds, and re-distribution locally across natural vegetated areas. Where required additional specialist treatment, including sediment bags and silt fences, was employed to ensure no deterioration in downstream water quality occurred;
- When extraction ceased within the borrow pit, the uphill face of the rock was stepped and deposits of soil were placed which assisted in the revegetation of the rock face.
- Following the cessation of rock extraction the borrow pits were back filled with peat removed from the permanent development footprint areas i.e. excavated roads, hard standing areas and turbine foundation areas; and
- Once the deposition of peat has been concluded the borrow pits will be permanently secured and a stock-proof fence to prevent access. Appropriate health and safety signage will also be installed.

2.2.12 Peat and Spoil Management Plan

2.2.12.1 Peat Storage Cells

While peat storage cells were not initially anticipated for the Permitted Development and therefore not included in the CEMP a method statement was developed for their construction. The peat storage cells were constructed in accordance with the environmental management measures set out in the CEMP (Appendix 3-2a) Peat storage cells comprised with the Subject Development were constructed using the following methodology:

- The areas to be used were marked out at the corners using ranging rods or timber posts.
- Tree felling occurred, where necessary,
- Ground was prepared in the area to be occupied by the peat cell and, where necessary, material was removed in order to create the required void space.
- Soil/peat were stripped in order to construct the rock berm.
- Rock from the on-site borrow pit was deposited and then placed using excavator.
- The berm was constructed in a manner which prevented water retention within the storage area. This was in order to prevent a build-up of hydrostatic pressure at the base of the berm at a varying rate across the footprint which could have effectively placed a point load at a specific location.
- Large rocks were placed with an ‘open bond’ periodically to allow water to pass through the berm in a controlled manner.
- The berm was inspected and signed off by competent personnel.

The following methodology was utilized for the deposition of peat within the peat cells:

- Excavators removed the peat from the development footprint areas i.e. excavated roads, hard standing areas and turbine foundation areas.
- Temporary, sealed stockpiling areas, located adjacent to the hard standing areas and turbine foundation areas, were chosen following onsite discussions

between the construction site manager, an ecologist, a geotechnical engineer and hydrologist.

- The excavators moved the excavated peat to the designated temporary stockpiling areas within the construction and soft levelled areas.
- The temporary stockpiling areas were surrounded by silt fences to ensure sediment-laden run-off did not occur.
- The excavated peat remained in these areas over a period of time until the volume of the peat has reduced as the water drains out of the mounded peat.
- The excavators then loaded the peat directly into dump trucks, to transport the peat to the nearest peat cell.
- The material was backfilled into the peat cells and spread evenly across the area.
- Once the deposition of peat has been concluded the peat cells will be permanently secured and a stock-proof fence to prevent access. Appropriate health and safety signage will also be installed.

2.2.12.2 Peat Containment Berm

The berm was constructed after a minor peat slide and followed emergency response procedure for peat slide events as follows:

- On alert of a peat slide incident, all construction activities ceased, and all available resources were diverted to assist in the required mitigation procedures.
- Action was taken to prevent a peat slide reaching any watercourse. This took the form of the construction of a check barrage or berm on land.
- The localised peat slide did not represent an immediate risk to a watercourse and had essentially come to rest, the area was stabilised initially by rock infill, The failed area and surrounding area were then assessed by the engineering staff and stabilisation procedures implemented. The area was monitored until movements had ceased.

The berm was constructed as follows:

- Soil/peat were stripped in order to construct the rock berm. This peat was moved to the leeward side of the rock berm and spread to a depth of <500mm using a low ground pressure excavator.
- Articulated dump trucks drew rock from a borrow pit, this was deposited and then placed using excavator.
- Plant operators did not expose excessive amounts of the works area in front of the backfill material.
- The berm was constructed at a minimum of 6m in width at the beginning. It was widened further as construction continued so as to allow articulated dumpers and excavators to easily travel along the top.
- The berm was constructed in a manner which prevented water retention within the storage area. This was in order to prevent a build-up of hydrostatic pressure at the base of the berm at a varying rate across the footprint which could have effectively placed a point load at a specific location.
- Large rocks were placed with an ‘open bond’ periodically to allow water to pass through the berm in a controlled manner.
- The berm was inspected and signed off by competent personnel.

2.2.13 Water Quality Mitigation Measures

Water quality mitigation measures in the vicinity of the Subject Development were developed in accordance with the Reactive Site Drainage and Management provisions that were designed to ensure the protection of watercourses on the site.

2.2.13.1 Roadside Berms

A tracked excavator was used to create a low berm along the edges of the wind farm spine in key locations. The berms were constructed on the advice of the project hydrologist to a height of approximately 1m, bucket sealed, and allowed to revegetate naturally.

2.2.13.2 Stilling Ponds

A tracked excavator was used to excavate stilling ponds so that the length to width ratio was greater than 2:1, where the length is the distance between the inlet and the outlet. Stilling ponds were constructed in a wedge shape, with the inlet located at the narrow end of the wedge. Each stilling pond was a minimum of 1-1.5 metres in depth. The embankment that forms the sloped sides of the stilling were stabilised with vegetated turves.

Stilling ponds were inspected weekly and following rainfall events. Inlet and outlets were checked for sediment accumulation and anything else that might interfere with flows. Sediment was cleaned out as necessary.

2.2.14 Operation

The assesses the likely significant effects associated with the post construction phase of the Subject Development, referred to in the EIAR as the Operational Phase (and Decommissioning Phase, as described below). Given the nature of the Subject Development it has low potential for likely significant environmental effects post construction. The only activities associated with the Subject Development during the operation phase will be periodic maintenance of the site tracks which will be undertaken as part of the overall maintenance plan for the Meenbog Windfarm, and which was assessed in the EIAR for the Permitted Development. The borrow pits, peat cells and other deviations have been confirmed as stable, from an environmental perspective and safe from a Health & Safety perspective.
The presence of the Subject Development will have no bearing on the operational phase of the Meenbog Windfarm.

2.2.15 Decommissioning

Given the nature of the Subject Development it will have no bearing on the decommissioning phase of the Meenbog Windfarm. The Subject Development will not alter the decommissioning plan for the Meenbog Windfarm and it is likely that the components of the Subject Development would remain in situ in the event of decommissioning of the Meenbog Windfarm.

A Decommissioning Plan for the permitted development is in place and will be updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will agree with the competent authority at that time.

As noted in the Scottish Natural Heritage report (SNH) *Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms* (SNH, 2013) reinstatement proposals for a wind farm are made approximately 30 years in advance, so within the lifespan of the Proposed Wind Farm, technological advances and preferred approaches to reinstatement are likely to change. According to the SNH guidance, it is therefore:

> *"best practice not to limit options too far in advance of actual decommissioning but to maintain informed flexibility until close to the end-of-life of the wind farm".*

3. SURVEY METHODOLOGIES

3.1 Ecological Multidisciplinary Walkover Surveys

The Site was the subject of extensive and detailed ecological surveys during the pre-planning period for the Permitted Development and then during the construction phase, when ecological pre-commencement surveys were undertaken as required.

The assessment is based on detailed field and desk studies carried out between 2021 and 2023 and considers whether the Subject Development has had, or will have, the potential to result in significant effects on biodiversity.

Each of the individual components of the Subject Development was the subject of several ecological multi-disciplinary walkover surveys and desk studies between 2021 and 2023. The latest and most comprehensive of such surveys was undertaken on the 23rd/24th August 2023.These ecological multi-disciplinary walkover surveys were carried out in accordance with the methodology set out in NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009)

In addition, searches for invasive species listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011) were undertaken during the ecological walkover surveys.

3.2 Peat and Site Stability

3.2.1 2021 Site Stability Assessments

Two assessments of site stability were completed in 2021. The first by Fehily Timoney & Company was previously submitted to Donegal County Council on 2nd February 2021 ("the Fehily Timoney Report"). A second is the site-wide stability assessment by Ionic Consulting (the design Engineer for the construction stage of the Meenbog Windfarm). These geotechnical reports are standalone and should be read as a whole to ensure the full context of each report is understood. Both reports confirm the site geology to be similar to that defined in the 2017 EIAR which was lodged with the application for the Permitted Development ("the Submitted EIAR"), with only small variance where additional shear vane data is recorded in the area north of the T7 access road.

The Fehily Timoney Report presents an assessment of the constructed works including the Subject Development, floating roads, turbines and hard stands and other construction works. In addition to assessing the peat failure of the 12th November 2020, it also presents an assessment of peat stability hazard and risk and a series of recommendations.

These reports and assessments were fully considered in the preparation of this rNIS. The relevant excerpts from the reports are provided below to provide details to support the conclusions reached in the rNIS.

3.2.2 2023 Site Stability Assessment

In 2022 Ionic Consulting was acquired by, and became part of, AFRY Ireland Limited (AFRY). A site visit was performed by a geotechnical engineer from ARFY on 19th October 2023, to assess the overall stability of the works and infrastructure completed to date at the Meenbog Windfarm site. A Principal Civil Engineer (Liam Power) from AFRY and a Principal Geotechnical Engineer (James O Brien) from 'Tara Engineering Consultants' (Tara) attended the Site for the purpose of carrying out their review.

In advance of the Site visit, both parties carried out a review of the 'Ionic Peat Stability Quantitative Assessment Report' ("the Ionic 2021 Report") which provided detailed information into the areas of potential peat instability which focused the areas for inspection on this site visit.

All access roads, turbine foundations and hardstands within were inspected. Locations of previous peat movements as well as peat repository embankments were inspected. During the Site visit visual indicators of active movement/instability were not observed, and evidence of recent movements were not identified.

3.3 Water Quality Monitoring

3.3.1 Desktop Assessment of Water Quality Data

3.3.1.1 EPA Monitoring Data

The Biotic Index of Water Quality (BIWQ) was developed in Ireland by the Environmental Protection Agency (EPA). Biotic indices (Q-Values) reflect average water quality at any location. Q-values are assigned using a combination of habitat characteristics and structure of the macro-invertebrate community within the waterbody. Individual macro-invertebrate families are classified according to their sensitivity to organic pollution and the Q-value is assessed based primarily on their relative abundance within a sample.

The EPA operates a number of Q-value monitoring sites in the vicinity of the Site. Of the seven monitoring stations identified below, six are downstream of the Site in rivers that have the potential to be affected by construction activities at the Site. The other monitoring station is located upstream of the Site and is useful as reference site and to identify unrelated pressures within the watershed. EPA sampling stations are situated downstream of the Site in four out of the five subbasins relevant to the Subject Development. There is no EPA sampling station in the Glendergan subbasin which is located predominantly in Northern Ireland. The location of the EPA monitoring sites are shown in Figure 3-1. EPA monitoring sites are briefly described below.

1. *Sampling Station 1 "Br. u/s Mourne Beg Confluence" (ITM coordinates 608091E, 887615N), is located downstream on the Bunadaowen river immediately upstream of its confluence with Mourne Beg River. Data from this sampling station is relevant for deviations situated in the Bunadaowen subbasin.*
2. *Sampling station 2 "Bridge SW of Tonreagh" (ITM coordinates. 609853E, 888310N), is located on the Mournebeg River downstream of the confluence with the Bunadaowen River (which drains the site) and immediately upstream of the River Finn SAC. Data from this sampling station is relevant for deviations situated in the Bunadaowen and the Mourne Beg subbasin.*
3. *Sampling station 3 "Barnes Bridge" (ITM coordinates 603930E, 887019N) is located on the Lowerymore River close to the Wind Farm site entrance.*
4. *Sampling station 4 "Lowerymore - Keadew or New Br (nr Barnsmore Halt)" (ITM coordinates 601082E, 883845N), is located downstream from Sampling station "Barnes Bridge" at the beginning of Lough Eske and Ardnamona SAC on the Lowerymore river. This sampling stations samples for potential impacts of deviation on Lough Eske and Ardnamona SAC.*
5. *Sampling Station 5 "Shruhangarve Bridge" (ITM coordinates 610179E, 887240N) is located in the Shruhangarve subbasin on the Shruhangarve river. This is the river directly impacted by the peatslide.*
6. *Sampling station 6 "Red Burn Bridge" (ITM coordinates 608090E, 889317N), is located on the Mourne Beg river upstream from the construction site. This station is not affected by any activities at the wind farm site but provides a useful reference to identify other potential pressures in the watershed.*
7. *Sampling station 7 "~150m u/s Croagh Bridge (u/s Croagh Burn trib Conflu)" (ITM coordinates 612419E, 889317N), is located on the Mourne Beg river downstream of the wind farm site.*

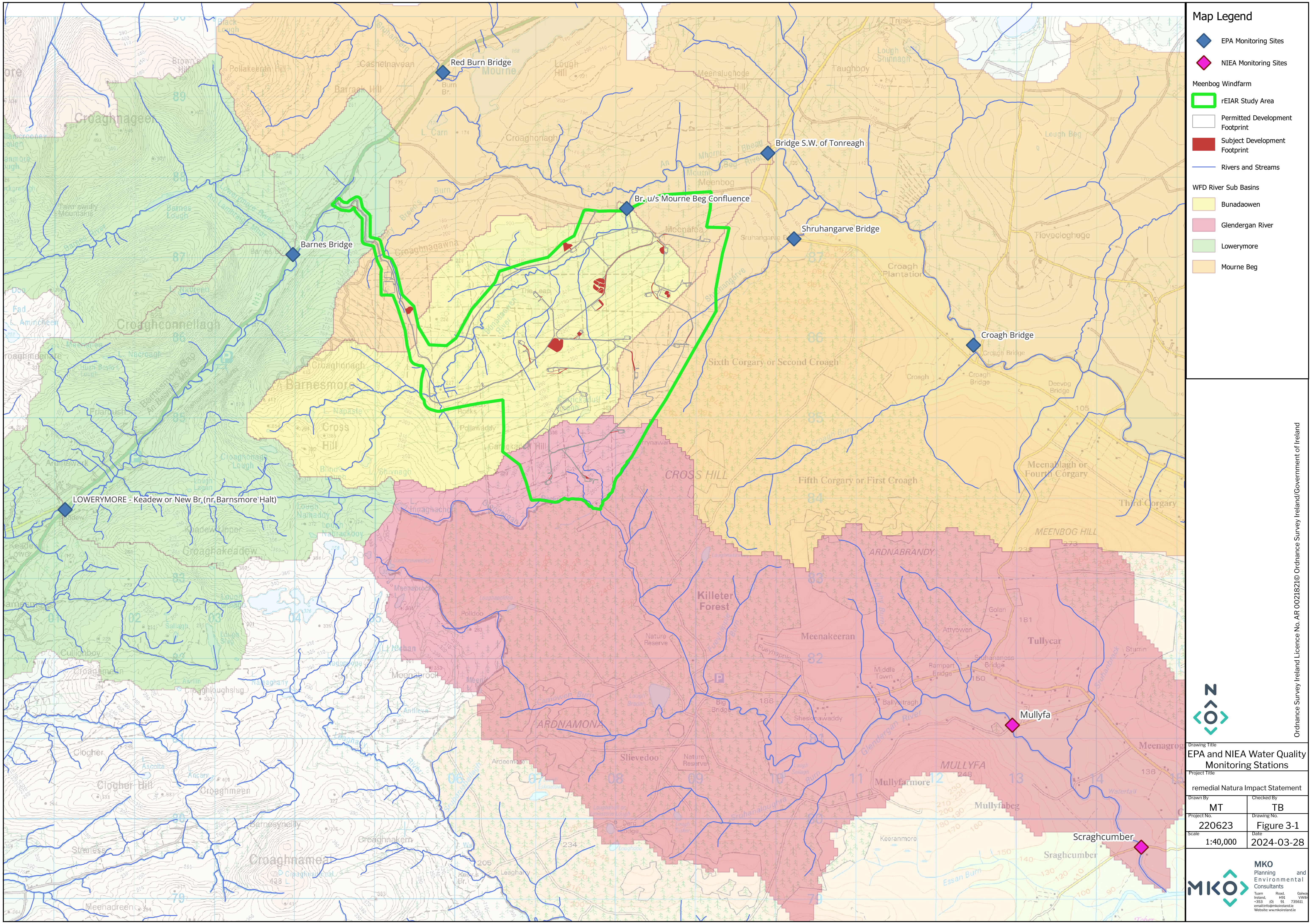
3.3.1.2 Northern Ireland Environment Agency Monitoring Data

The Northern Ireland Environment Agency (NIEA), an agency with the Department of Agriculture Environment and Rural Affairs is responsible for water quality monitoring in Northern Ireland. Three deviations (No. 8, 9 and 10) forming part of the Subject Development are situated in the Glendergan catchment, which drains across the Northern Irish border into the River Derg. The three deviations

were assessed as low or no ecological risk by SLR (2022). The Northern Ireland Water Framework Directive Statistics Report 2021 ("the 2021 Report") is the latest available water quality report. Water bodies are assessed against a number of elements as required by the Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017. For surface waters, ecological status is assessed against five classes: bad; poor; moderate; good; and high. Chemical status surface water bodies are assessed against two classes: good and failing to achieve good. The status of a water body is determined by the lowest test element and follows the one-out, all-out rule. The ecological status of a river waterbody is consequently assigned as a combination of lowest test element from the chemical testing and biological testing.

In the 2021 Report, uPBT substances, so called 'forever' chemicals, and Cybermethrin, an insecticide, were included for the first time in the chemical classification. Prior to 2021 these criteria were not included in the assessments. Further information on these significant changes in methodology can be found in the 2021Report.

Therefore, across Northern Ireland, river waterbody ecological status has declined as 'forever' chemicals were recorded in all rivers The NIEA Catchment Data Viewer allows for comparison of river classification without the inclusion of 'forever' chemicals, which allows for comparison of pre- and post- construction water quality in the Glendergan river. Results for the Glendergan River water quality are presented in Section 5.3.1.2 of this rNIS. The relevant monitoring locations in the Glendergan catchment are Glendergan River at Monyfa (Site Code F11467) and Glendergan River at Scraghcumber (Site code F10049).



Map Legend
EPA Monitoring Sites
NIEA Monitoring Sites
Meenbog Windfarm
rEIAR Study Area
Permitted Development Footprint
Subject Development Footprint
Rivers and Streams
WFD River Sub Basins
Bunadaowen
Glendergan River
Lowerymore
Mourne Beg
Red Burn Bridge
Bridge S.W. of Tonreagh
Br. u/s Mourne Beg Confluence
Shruhangarve Bridge
Barnes Bridge
Croagh Bridge
LOWERYMORE - Keadew or New Br.(nr Barnsmore Halt)
Mullyfa
Scraghcumber
Ordnance Survey Ireland Licence No. AR 0021821© Ordnance Survey Ireland/Government of Ireland
Drawing Title
EPA and NIEA Water Quality Monitoring Stations
Project Title
remedial Natura Impact Statement
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Figure 3-1
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Date
2024-03-28
MKO
Planning and Environmental Consultants

3.3.2 Project Water Monitoring Programme

Planree Ltd. engaged MKO to undertake water quality monitoring in line with the requirements set out in the EIAR for the Permitted Development and Construction Environmental Management Plan (CEMP) for the Meenbog Windfarm. This included sonde installation to provide continuous turbidity monitoring as a water quality early warning system, providing a suitably qualified ECoW to perform daily visual checks in locations in waterways across the Site during construction, and monthly water chemistry monitoring.

Three of the surface water sampling sites were located on the Bunadaowen, namely SW1, SW2 and SW3. SW4 was located on Mary Breen's Burn. A map to show locations of Planree Ltd's water monitoring programme can be found in Figure 3-2.

3.3.2.1 Continuous Turbidity Monitoring

Sondes were installed as a water quality early warning system in the Lowerymore River, Bunadaowen River, and Shruhangarve prior to construction. The purpose of the sondes is to measure turbidity in the waterbodies downstream of the Meenbog Windfarm construction areas. Turbidity is a measure of the cloudiness of a fluid and may be used as an indicator of potential suspended solids within the fluid. Sondes function by measuring the intensity of light reflected by particles in a water sample. Results are recorded in Nephelometric Turbidity Units (NTUs). The purpose of the sondes was to act as an early warning system of potential sediment input into receiving waters, which may arise for any number of reasons, and to allow further investigations and if required, remedial action to be taken in a timely fashion. The sondes were not used as a measure of water quality, which was instead assessed through chemical and biological water monitoring and included a direct measurement of total suspended solids (TSS).

Three Sondes, MSe1, MSe3, and MSe4, were installed on 9th September 2019. Three more sondes were installed following the peat slide that occurred on the 13th November 2020. MSe 5, 6, and 7 were installed in various locations along the Mournebeg River to monitor turbidity upstream of active works and downstream of the Shruhangarve Stream which had been effected by the peat slide. MSe5 was installed on the 18th November 2020, MSe 6 was installed was installed on the 26th November 2020, and MSe7 on the 8th February 2021. MSe 3 which was located on the Shruhangarve, was lost during the peat slide on November 12th 2020 and was reinstalled on 18th December 2020. The locations of all sondes are shown on Figure 3-2.

3.3.2.2 Visual Checks

The ECoW undertook daily visual checks of waterbodies during the construction phase and recorded relevant observations photographically and in written form. Checks included maintenance of Sondes, and visual inspection of surface water sampling points and of all visual check locations. Visual check locations are shown on Figure 3-2.

3.3.2.3 Surface Water Chemistry Monitoring

Monthly samples of parameters were taken by suitably qualified personal from August 2019 to February 2023 and sent to an accredited laboratory for analysis and then compared to baseline prior to the onset of construction. A total of four locations were sampled. Monthly sampling was paused in February 2023 as water quality at all sampling locations had been stable for nearly two years.

Map Legend

- Chemical Water Sampling Locations
- Continous Turbidity Monitoring (Sondes)
- Visual Check Locations

Meenbog Windfarm

- rEIAR Study Area
- Permitted Development Footprint
- Subject Development Footprint
- Rivers and Streams

WFD River Sub Basins

- Bunadaowen
- Glendergan River
- Lowerymore
- Mourne Beg

Drawing Title
Meenbog Windfarm Water Quality Monitoring Locations

Project Title
remedial Natura Impact Statement

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3.3.2.4 Biological Water Quality Assessment (Q-sampling)

3.3.2.4.1 *Baseline*

MKO were appointed to conduct baseline surveys for aquatic macroinvertebrates for Q-Value determination to support the EIAR and planning application for the Permitted Development.

Sampling was carried out at one site on the Lowerymore River, two sites on Mary Breen's Burn, one site on the Bunadaowen River, and one site on the Mourne Beg River on the 16-18th of September 2014. The location of the survey points is provided in Figure 3-3.

The sampling method used was the same as that used by the EPA for their national water sampling regime (Toner *et al.* 2005) A three-minute kick sample was collected from a stream bed area of approximately one square metre with a standard handnet (250 mm x 250 mm, with a 300 mm bag depth and a 1 mm mesh size). One minute hand searches, of large objects such as tree branches or stones, was undertaken prior to each of the kick samples. The kick sampling time was divided proportionally among the habitats present in the area, such as fast-moving riffles, shallow water, and silted banks. Samples were sorted on site and sub-samples were collected to examine at a later stage due to the large amount of debris recovered. Specimens were identified using the FBA Guide to Freshwater Invertebrates (Dobson *et al.*, 2012). Reference categories for EPA Q-ratings are provided in Table 3-1 below.

Table 3-1 Reference categories for EPA Q-ratings (Q1 to Q5)

Q Value	WFD Status	Pollution status	Condition
Q5 or Q4-5	High status	Unpolluted	Satisfactory
Q4	Good status	Unpolluted	Satisfactory
Q3-4	Moderate status	Slightly polluted	Unsatisfactory
Q3 or Q2-3	Poor status	Moderately polluted	Unsatisfactory
Q2, Q1-2 or Q1	Bad status	Seriously polluted	Unsatisfactory

3.3.2.4.2 *Further Monitoring during Construction Phase*

Aquatic macroinvertebrate sampling for Q-Value determination was undertaken by suitably qualified ecologists in December 2020, October 2021, and October 2023. Sampling in 2020 was undertaken by MKO. Sampling in 2021 was undertaken by Triturus Environmental Ltd, and sampling in 2023 again undertaken by MKO. The sampling method used was the same as that used by the EPA for their national water sampling regime (Toner *et al.* 2005) and is described above.

November 2020 Sampling Event

Following the peat slide event in November 2020, ecologists from MKO completed ecological walkover surveys, otter surveys and kick sampling for macro-invertebrates at various locations along the Mourne Beg River and its tributaries. The 2020 preliminary watercourse, otter and macroinvertebrate assessment is attached as Appendix 3-1 to this report.

As part of this survey effort, 19 kick samples were undertaken at locations on the Mourne Beg River both upstream and downstream of the Meenbog Windfarm, on the Bunadaowen River and the Shruhangarve Stream which discharge water to the Mourne Beg River, and on two un-named tributaries of the Mourne Beg River downstream of the Shruhangarve.

Out of the 19 kick sample locations, six were in similar locations as the sampling points for 2021 and 2023.Each sample point is labelled in Figure 3-4.

- Sample Point 2 corresponds to B1.
- Sample Point 3 corresponds to M2.
- Sample Point 4 corresponds to M3.
- Sample Point 6 corresponds to M4.
- Sample Point 15 corresponds to M5.
- Sample Point 7 is just downstream of S1, and the closest sample point to record sampling data for 2020, the reason for this being conditions further upstream in the Shruhangarve unsuitable for sampling.

Results of all 19 kick sampling locations is available in Appendix 3-1.

October 2021 Sampling Event

In October 2021, a total of *10* riverine survey sites on the Mourne Beg River (M1-M8), Bunadaowen River (B1) and Shruhangarve (S1) were assessed for biological water quality through Q-sampling. The full 2021 Aquatic Assessment Report in included as Appendix 3-2 to this report.

October 2023 Sampling Event

In October 2023, the same 10 riverine survey sites that were surveyed in 2021 were assessed for biological water quality through Q-sampling. Due to water high water levels at the time of the survey two sites (M2 and M5) could not be assessed in 2023. The full 2023 Aquatic Assessment Report is included as Appendix 3-3 to this report.

The location of Biological Water Quality Monitoring for Q values is shown in Figure 3-4.

Map Legend

- Meenbog Windfarm Q-Value Baseline Monitoring Locations

Meenbog Windfarm

- rEIAR Study Area
- Permitted Development Footprint
- Subject Development Footprint
- Rivers and Streams

WFD River Sub Basins

- Bunadaowen
- Glendergan River
- Lowerymore
- Mourne Beg

01
02
03
04
05

Drawing Title
Meenbog Windfarm Q-Value Baseline Monitoring Locations

Project Title
remedial Natura Impact Statement

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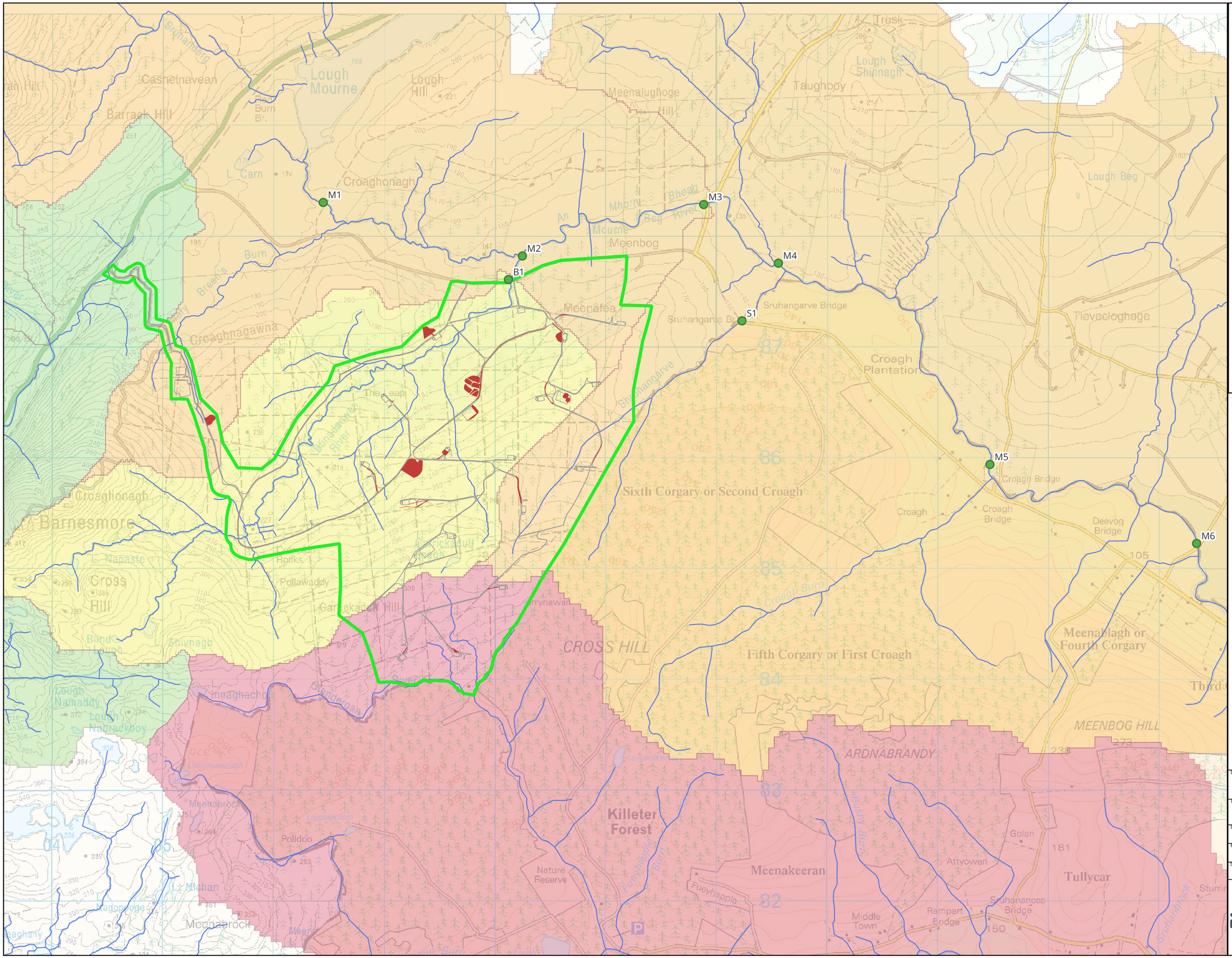

Map Legend

- Meenbog Windfarm Q-Value Monitoring Locations

Meenbog Windfarm

- rEIAR Study Area
- Permitted Development Footprint
- Subject Development Footprint
- Rivers and Streams

WFD River Sub Basins

- Bunadaowen
- Glendergan River
- Lowerymore
- Mourne Beg

Drawing Title
Meenbog Windfarm Q-Value Monitoring Locations

Project Title
remedial Natura Impact Statement

Drawn By	Checked By
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4. CHARACTERISATION OF BASELINE ENVIRONMENT

4.1 Results of Baseline Ecological Surveys

The locations of all the components of the Subject Development are shown in relation to the habitats as identified in the EIAR for the Permitted Development in Figure 4-1. Each of the components are described below in terms of their current ecological conditions and pre-construction habitats/environment.

4.1.1 Ecological Multi-Disciplinary Walkover Surveys

4.1.1.1 Deviation 1 Entrance road off N15 (the hairpin bend)

4.1.1.1.1 *Current Conditions*

The site of the deviation was the subject of a comprehensive ecological walkover survey on the 23rd August 2023. The current habitats at the site of Deviation 1 include Spoil and Bare Ground (ED2), Recolonising Bare Ground (ED3) associated with the ongoing operation of the quarry and the new access road (Plate 4-1), willow (*Salix cinerea*) and bramble (*Rubus fruticosus*) Scrub (WS1) and Active Quarries and Mines (ED4) in the wider area. In addition, the relocated settlement pond was observed and classified as Artificial Lakes and Ponds (FL8), this was lined with plastic and was of low ecological value (Plate 4-2). The overflow system was observed and was in use at the time of the visit (after several days of heavy rain), with the pond discharging to an existing culvert beneath the new road and an existing quarry road and into a drain that forms part of the original quarry drainage network. No significant habitat for any of the Key Ecological Receptors (KERs) or Key Ornithological Receptors (KORs) or KORs that were identified in the Submitted EIAR or the NIS which was lodged with the application for the Permitted Development ("the Submitted NIS") were recorded at the site of Deviations 1 and no additional significant faunal habitat was recorded. The site of Deviation 1 was assessed by AFRY Engineers (2023) as stable. The AFRY site technical note is available in Appendix 4-1..

Plate 4--1 Deviated section of access road as viewed from the southeast – facing northwest towards the N15 (August 2023).

Plate 4--2 Relocated and plastic lined settlement pond showing overflow pipe (August 2023).

4.1.1.1.2 Pre-Construction Habitat/ Environment

The receiving environment at the site Deviation 1 prior to any works being undertaken included existing quarry infrastructure with scrub and bare ground, an artificial pond and an active quarry with associated access roads. The area is mapped as Artificial Lakes and Ponds (FL8), Scrub (WS1) and Active Quarries and Mines (ED4) on the habitat map that was provided in Figure 6.4 of the Submitted EIAR (reproduced in Figure 4-1). The area is described in relation to Active Quarries and Mines (ED4)/Spoil and Bare Ground (ED2) and Other Artificial Lakes and Ponds (FL8) on pages 6-29 and 6-30 respectively of the Submitted EIAR.. No invasive alien species (IAS) listed on the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011) were identified in this area during the baseline surveys undertaken. Subsoils on the site of Deviation 1 were blanket peat with a peat depth of 0-1.5m (Ionic 2021 Report).

An overflow system was in place in the form of one concrete pipe that redirect any water overtopping the pond into an existing quarry drainage network.

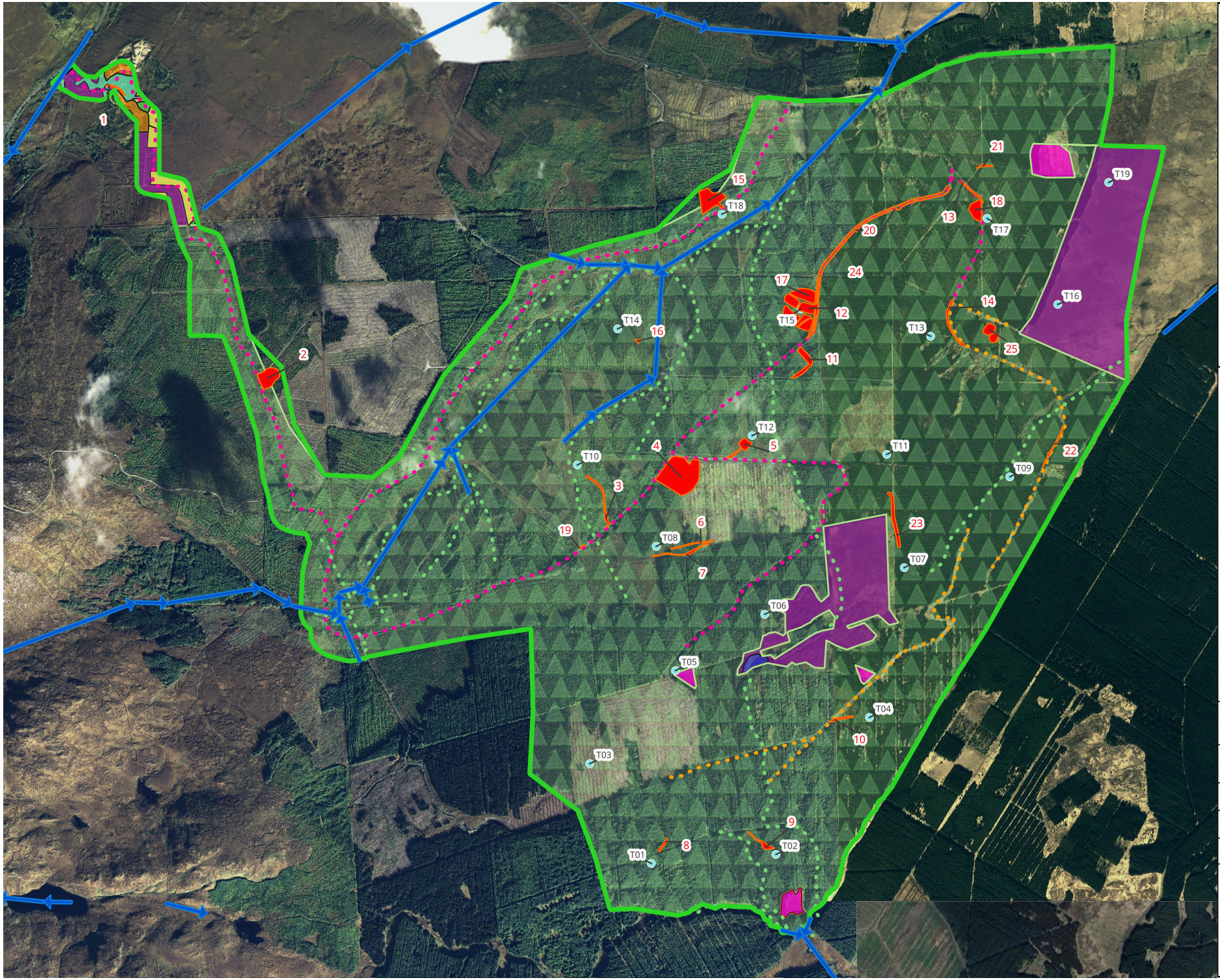
4.1.1.1.3 European Sites

Deviation 1 is situated within 10m of the Croaghonagh Bog SAC at closest but is separated from it by an existing track, which was upgraded as part of the Permitted Development. The Qualifying Interest (QI) for Croaghonagh Bog is Blanket bogs (* if active bog) [7130]. The works were undertaken downgradient of the SAC.

Deviation 1 is located within the Lowerymore River catchment and is within 200m of a tributary of Lowerymore River, which flows into the Lough Eske and Ardnamona Wood SAC approximately 6.4km downstream (Surface Water Distance). The SAC is designated for the following QIs:

- Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110],
- Petrifying springs with tufa formation (*Cratoneurion*) [7220],
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]
- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Salmo salar* (Salmon) [1106].
- *Trichomanes speciosum* (Killarney Fern) [1421]

The results of the walkover surveys did not reveal any findings that alter the conclusions of the SubmittedNIS . An assessment of the potential for the deviation to result or have resulted in adverse effects on European Sites is provided in Sections Seven and Eight below.



Map Legend

- rEIAR Study Area
- Subject Development
- Footprint
- EPA River Waterbodies
- Conifer Plantation (WD4)
- Buildings and Artifical Surfaces (BL3)
- Active Quaries and Mines (ED4)
- Dystropic Lakes (FL1)
- Other Artificial Lakes and Ponds (FL8)
- Wet Grassland (GS4)
- Wet Heath (HH3)
- Upland Blanket (PB2)
- Upland Blanket Bog/ Wet Heath (PB2/HH3)
- Cutover Bog (PB4)
- Scrub (WS1)
- Turbine Locations
- Buildings and Artificial Surfaces
- Spoil and Bare Ground (ED2)
- Recolonising Bare Ground (ED3)
- Eroding Upland Rivers (FW1)
- Drainage Ditch (FW4)

Drawing Title: Habitats Recorded Within the Site

Project Title: remedial Natura Impact Statement

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Project No.	Drawing No.
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4.1.1.2 Deviation 2 - Peat cell southeast of Substation

4.1.1.2.1 *Current Conditions*

The site of the Deviation 2 was the subject of a comprehensive ecological walkover survey on the 23rd August 2023. The current conditions on the site are described below. Peat arisings were deposited in the peat cells up until July 2020. Since that time the surface of the deposited peat has revegetated with species including soft rush (*Juncus effusus*), ling (*Calluna vulgaris*), and tormentil (*Potentilla erecta*). Some grey willow (*Salix cinerea*) and *Sphagnum* species were starting to recolonise also. It was best classified as wet heath (HH3). A stone bank formed the western boundary of the peat cell. Plates 4-3 and 4-4 below show the progression of site revegetation from 2021 to present. Conifer plantation (WD4) surrounded the site to the north, east and south. No evidence of any overtopping or run off from the peat storage area was recorded during the site visit and the peat was firm underfoot with wet pools present throughout. No watercourses or running drains were recorded on the site of Deviation 2. There were dry drains associated with the road and a small watercourse located on the opposite side of the road from the deviation and removed from it by approximately 25metres. No significant habitat for any of the KERs or KORs that were identified in the Submitted EIAR or the Submitted NIS were recorded at the site of Deviation 2 and no additional significant faunal habitat was recorded. A sitewide geotechnical stability assessment was carried out in October 2023 by AFRY. The assessment found that the peat cells are stable works are complete at this deviation.

Plate 4--3 Peat Surface after Peat Deposition (2021)

Plate 4--4 Revegetated Peat Surface (2023)

4.1.1.2.2 Pre-Construction Habitat/ Environment

The receiving environment at the site of Deviation 2 prior to any works being undertaken was located partially within the EIAR study area for the permitted development and the area was shown on the Habitat Map (EIAR Figure 6.4 reproduced in Figure 4-1) as primarily Conifer Plantation (WD4) with an existing borrow pit and trackway also present. A review of aerial photography and an assessment of the surrounding area confirms that the area that was outside the study area is likely to have been similar Conifer Plantation habitat with poorly performing Sitka spruce and heath type vegetation beneath.

4.1.1.2.3 European Sites

Croaghonagh Bog SAC is c.750m from the development. The QI for Croaghonagh Bog is Blanket bogs (* if active bog) [7130]. Deviation 2 is located entirely outside of this European Site and whilst a small stream runs into the SAC from close to the site of the deviation, no complete source-pathway receptor chain for impacts on the terrestrial Qualifying Interest of the SAC (Blanket Bog 7130) was identified.

The River Finn SAC is located approximately 7.3km downstream of this deviation and a potential source- pathway-receptor chain for the effects on the following QI species was identified:

- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

The results of the walkover surveys did not reveal any findings that alter the conclusions of the Submitted NIS. An assessment of the potential for the deviation to result or to have resulted in adverse effects on European Sites is provided in Sections Seven and Eight below.

4.1.1.3 Deviation 3 T10 access road

4.1.1.3.1 *Current Conditions*

The site of the Deviation 3 was the subject of a comprehensive ecological walkover survey on the 23rd August 2023. The current conditions at the site of Deviation 3 are described below. The deviation involved a slight realignment of the access road to T10. This may have resulted in additional loss of trees however the habitats at the site of the deviation include a new access road in a slightly altered position that is classified as Buildings and Artificial Surfaces (BL3) and an area that has been cleared of Conifer Forestry and is now recolonising with vegetation that is dominated by soft rush (*Juncus effuses*) and bulbous rush (*Juncus bulbosus*). There are also numerous grey willow (*Salix cinerea*) seedlings in this area and it is likely that it will ultimately succeed to willow scrub (WS1) and woodland habitat. The site of Deviation 3 is completely surrounded by Conifer Plantation (WD4). There is a tributary of the Bunadaowen located approximately 35m to the west of Deviation 3. No significant habitat for any of the KERs or KORs that were identified in the Submitted EIAR or the Submitted NIS were recorded at this site and no additional significant faunal habitat was recorded. The recolonising habitats will likely provide good broadleaved woodland and scrub habitat. The existing site conditions is shown in Plate 4-5.

Plate 4--5 Rushy vegetation dominating the habitat at Deviation 4.

4.1.1.3.2 *Pre-Construction Habitat/ Environment*

The receiving environment on the site of Deviation 3 is located entirely within the Submitted EIAR study area and was assessed in the Submitted EIAR.. It is shown on the Habitat Map (reproduced in Figure 4-1) within the Submitted EIAR as comprising of Conifer Plantation (WD4). It was not identified as a KER habitat or an area that provided significant habitat for KER or KOR species. This is consistent with the surrounding habitats in the area, which comprise Sitka spruce dominated conifer plantation.

No invasive alien species (IAS) listed on the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011) were identified in this area during the baseline surveys undertaken.

4.1.1.3.3 *European Sites*

Deviation 3 is located within the Bunadaowen Catchment but is approximately 35m from any natural watercourses. The River Finn SAC is located within the same catchment, approximately 6km downstream (surface water distance) of this deviation and a potential source- pathway-receptor chain for the effects on the following QI species was identified:

- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

The results of the walkover surveys did not reveal any findings that alter the conclusions of the Submitted NIS. An assessment of the potential for the deviation to result or have resulted in adverse effects on European Sites is provided in Sections Seven and Eight below.

4.1.1.4 Deviation 4 Borrow Pit southwest of T12

4.1.1.4.1 *Current conditions*

The site of Deviation 4 was the subject of a comprehensive ecological walkover survey on the 23rd August 2023. The current conditions on the site of Deviation 4 are described below. Since the cessation of peat deposition in the cell, the surface of the deposited peat has revegetated with species including soft rush (*Juncus effusus*), bulbous rush (*Juncus bulbosus*), Yorkshire fog (*Holcus lanatus*) and tormentil (*Potentilla erecta*). Some ling (*Calluna vulgaris*), *Polytrichum* and *Sphagnum* species were starting to recolonise also. It was best classified as wet heath (HH3) (Plates 4-6 and 4-7). A constructed stone bank formed the north western boundary of the peat cell and sections of the borrow pit that have not been fully reinstated with peat support bare rock habitat (ED4) (Plate 4-8). The surrounding areas include the main wind farm spine road to the north west, another wind farm/forestry road (BL3) to the north and young Conifer Plantation (WD4) on shallow peats to the south and east. Heath vegetation was evident beneath the conifer trees. No evidence of any overtopping or run off from the peat storage area was recorded during the site visit and the peat was firm underfoot with wet pools present throughout. No watercourses or running drains were recorded on the site of Deviation 4. No significant habitat for any of the KERs or KORs that were identified in the Submitted EIAR or the Submitted NIS were recorded at this site and no additional significant faunal habitat was recorded. The revegetating cells provided good habitat for reptiles and amphibians. A sitewide geotechnical stability assessment was carried out in October 2023. The assessment found that the peat cells are stable (AFRY, 2023).

Plate 4--6 Revegetating surface of peat cell

Plate 4--7 Close up of revegetating surface of peat cell

Plate 4--8 Unfilled section of peat cell and conifer plantation on shallow peats in the surrounding area.

4.1.1.4.2 *Pre-Construction Habitat/ Environment*

The receiving environment on the site of s Deviation 4 is located entirely within the Submitted EIAR study area and is fully described in the Submitted EIAR. There was an existing borrow pit surrounded by a conifer plantation with a small artificial pond within the pit as shown in Plate 4-9 and described in Section 6.3.2.1 of the Submitted EIAR. The artificial pond was artificially created and was part of forestry infrastructure. It was not assigned as a KER. The Habitat Map (reproduced in Figure 4-1) shows the area as conifer plantation (WD4). The existing borrow pit was considered to be insignificant in the context of the overall conifer plantation in the area and the use of this existing borrow pit was assessed and permitted. This deviation from the Permitted Development was within the forestry plantation that surrounded the existing forestry borrow pit. The subsoils in this area were made up of blanket peat at a depth of 0.1-1.5m (Ionic 2021 Report).

Plate 4--9 Pre – existing borrow pit at the location of Deviation 5.

4.1.1.4.3 *European Sites*

Deviation 4 is located within the Bunadaowen Catchment but is approximately 190m from any natural watercourses. There are forestry drains that provide indirect hydrological connectivity to this watercourse. The River Finn SAC is located within the same catchment, approximately 5.5km downstream (surface water distance) of this deviation and a potential source- pathway-receptor chain for the effects on the following QI species was identified:

- Salmo salar (Salmon) [1106]
- Lutra lutra (Otter) [1355]

The results of the walkover surveys did not reveal any findings that alter the conclusions of the Submitted NIS. An assessment of the potential for this deviation to result or have resulted in adverse effects on European Sites is provided in Sections Seven and Eight below.

4.1.1.5 Deviation 7 T8 access road

4.1.1.5.1 *Current conditions*

The site of the Deviation 7 was the subject of a comprehensive ecological walkover survey on the 23rd August 2023. The current conditions on the site of Deviation 7 are described below. The deviation involved a slight realignment of the access road to T08 following the construction of a containment berm in the area. The road was constructed closer to the berm than originally proposed and avoided additional loss of trees. The habitats at the site of the deviation include a new access road in a slightly altered position that is classified as Buildings and Artificial Surfaces (BL3) and an area on both sides of the access road that has been cleared of Conifer Forestry and is now recolonising with vegetation that is dominated by bryophytes with soft rush (*Juncus effuses*) and bulbous rush (*Juncus bulbosus*). Ling (*Calluna vulgaris*) and foxglove (*Digitalis purpurea*) were among the species that were recolonising close to the retained forestry plantation. It is likely that it will ultimately succeed to willow scrub (WS1) and woodland habitat. The site of Deviation 7 is completely surrounded by Conifer Plantation (WD4) There is a tributary of the Bunadaowen located approximately 190m to the north west of the deviation. No significant habitat for any of the KERs or KORs that were identified in the Submitted EIAR or the Submitted NIS were recorded at the site of Deviation 7 and no additional significant faunal habitat was recorded. The recolonising habitats will provide likely provide good broadleaved woodland and scrub habitat. The existing site conditions are shown in Plates 4-10. and 4-11.

Plate 4--10 Containment berm on left of plate, with amended road to the right. Recolonising habitats visible where conifer forestry has been felled

Plate 4--11 Amended Road. Recolonising habitats visible where conifer forestry has been felled

4.1.1.5.2 Pre-Construction Habitat/ Environment

The receiving environment on the site of Deviation 7 is located entirely within the Submitted EIAR study area and was assessed in the Submitted EIAR,. It is shown on the Habitat Map (Reproduced in Figure 4-1) within the Submitted EIAR as comprising of Conifer Plantation (WD4). It was not identified as a KER habitat or an area that provided significant habitat for KER or KOR species. This is consistent with the surrounding habitats in the area, which comprise Sitka spruce dominated conifer plantation.

No invasive alien species (IAS) listed on the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011) were identified in this area during the baseline surveys undertaken.

4.1.1.5.3 European Sites

The deviation is located within the Bunadaowen Catchment but is approximately 190m from any natural watercourses. The River Finn SAC is located within the same catchment, approximately 6.5km downstream (surface water distance) of this deviation and a potential source- pathway-receptor chain for the effects on the following QI species was identified:

- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

The results of the walkover surveys did not reveal any findings that alter the conclusions of the Submitted NIS. An assessment of the potential for the deviation to result or have resulted in adverse effects on European Sites is provided in Sections 7 and 8 below.

4.1.1.6 Deviation 10 T4 access road

4.1.1.6.1 *Current Conditions*

The site of Deviation 10 was the subject of a comprehensive ecological walkover survey on the 23rd August 2023. The current conditions on the site of Deviation 10 are described below. The deviation involved a slight realignment of the access road to T04. This resulted ina minor additional loss of trees, however the habitats at the site of the deviation include a new access road in a slightly altered position that is classified as Buildings and Artificial Surfaces (BL3) and an area that has been cleared of Conifer Forestry and is now recolonising with vegetation that is dominated by soft rush (*Juncus effuses*) but also includes heath vegetation including Sphagnum mosses, and Ling (*Calluna vulgaris*). It is likely that heath vegetation will dominate in this area. The site of Deviation 10 is completely surrounded by Conifer Plantation (WD4) and clear felled forestry. There is a tributary of the Glendergan River located approximately 400m to the west of the deviation, though indirect connectivity to this may be provided through forestry drains in the area. No significant habitat for any of the KERs or KORs that were identified in the Submitted EIAR or the Submitted NIS were recorded at the site of Deviation 10 and no additional significant faunal habitat was recorded. The recolonising habitats will provide likely provide wet heath habitat in the future. The existing site conditions are shown in Plate 4-12.

Plate 4--12 Slight amendment to location of access road, showing heath habitats recolonising where the conifer forestry has been felled

4.1.1.6.2 *Pre-Construction Habitat/ Environment*

The receiving environment on the site of Deviation 10 is located entirely within the Submitted EIAR study area and was assessed in the Submitted EIAR. It is shown on the Habitat Map (Reproduced in Figure 4-1) within the Submitted EIAR as comprising of Conifer Plantation (WD4). It was not identified as a KER habitat or an area that provided significant habitat for KER or KOR species. This is consistent with the surrounding habitats in the area, which comprise Sitka spruce dominated conifer plantation.

No invasive alien species (IAS) listed on the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011) were identified in this area during the baseline surveys undertaken.

4.1.1.6.3 *European Sites*

Deviation 10 is located within the Glendergan River Catchment but is approximately 400m from any natural watercourses. The River Foyle and Tributaries SAC [UK0030320] is located within the same catchment, approximately 850m downstream (surface water distance) of this deviation and a potential source- pathway-receptor chain for the effects on the following QI species was identified:

- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]
- Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callicricho-Batrachion* vegetation

The results of the walkover surveys did not reveal any findings that alter the conclusions of the Submitted NIS. An assessment of the potential for Deviation 10 to result or to have resulted in adverse effects on European Sites is provided in Sections Seven and Eight below.

4.1.1.7 Deviation 11 Borrow pit (BP2) south of T15

4.1.1.7.1 *Current Conditions*

The site of the Deviation 11 was the subject of a comprehensive ecological walkover survey on the 23rd August 2023. The current conditions on the site of Deviation 11 are described below. Since the cessation of peat deposition in the cell, the surface of the deposited peat has begun to revegetate with species including soft rush (*Juncus effusus*), Yorkshire fog (*Holcus lanatus*), creeping bent grass (*Agrostis stolonifera*) and tormentil (*Potentilla erecta*) It was best classified as recolonising bare ground but is likely to succeed to Wet Grassland (GS4) and wet heath (HH3). No sphagnum development was recorded on the site of Deviation 10. The bund walls consisted primarily of bare rock with some revegetation. They were best classified as Recolonising Bare Ground (ED3). Whilst there are forestry drains in the area, there were no obvious flowing drains recorded and no signs of overtopping or pollution. There is a tributary of the Bunadaowen located approximately 60m to the west of the deviation. An unfilled section of the pit exists in the north eastern section of the site. This supports bare rock and a pool that is classified as Artificial Lakes and Ponds (FL8). No significant habitat for any of the KERs or KORs that were identified in the Submitted EIAR were recorded at this site and no additional significant faunal habitat was recorded. The revegetating cells will provide good habitat for reptiles and amphibians in the future. The existing site conditions are shown in Plates 4-13 and 4-14. A sitewide geotechnical stability assessment was carried out in October 2023 by AFRY and attached in Appendix 4-1. The assessment found that the peat cells are stable.

Plate 4--13 Recolonising Bare Ground inside peat cell

Plate 4--14 Unfilled section of peat cell with artificial pond

4.1.1.7.2 Pre-Construction Habitat/ Environment

The receiving environment on the site of this deviation is located entirely within the Submitted EIAR study area and was assessed in the Submitted EIAR. It is shown on the Habitat Map (Reproduced in Figure 4-1) within the Submitted EIAR as comprising of Conifer Plantation (WD4) with associated road and track infrastructure. It was not identified as a KER habitat or an area that provided significant habitat for KER or KOR species. This is consistent with the surrounding habitats in the area, which comprise Sitka spruce dominated conifer plantation.

No invasive alien species (IAS) listed on the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011) were identified in this area during the baseline surveys undertaken.

4.1.1.7.3 European Sites

The deviation is located within the Bunadaowen Catchment but is approximately 60m from any natural watercourses. There are forestry drains that provide indirect hydrological connectivity to this watercourse. The River Finn SAC is located within the same catchment, approximately 4.5km downstream (surface water distance) of this deviation and a potential source- pathway-receptor chain for the effects on the following QI species was identified:

- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

The results of the walkover surveys did not reveal any findings that alter the conclusions of the Submitted NIS. An assessment of the potential for the deviation to result or have resulted in adverse effects on European Sites is provided in Sections Seven and Eight below.

4.1.1.8 Deviation 15 Peat cells NW of T18

4.1.1.8.1 *Current Conditions*

The site of the Deviation 15 was the subject of a comprehensive ecological walkover survey on the 23rd August 2023. The current habitats at the site of Deviation 15 include clear felled conifer plantation (WD4). It was felled as part of consent for bat mitigation around T18 and thus included in planning consent for the Permitted Development. The rock has been excavated from this peat cell, but the deposition of peat has not commenced. The resultant pit has filled with water with no sign of overtopping, and the adjacent turbine base is also flooded. The cell is classified as Spoil and Bare Ground (ED2) Artificial Pond (FL8). An existing forestry track is located to the south of the deviation and there are forestry drains associated with it. No signs of pollution or run-off into the drains were recorded during the site visit. The surrounding habitats include Conifer Plantation to the north, east and west, with the infrastructure associated with T18 located to the south. The Bunadaowen River is located, at closest, 80 meters from this deviation and there is an indirect link with it via forestry drains. No significant habitat for any of the KERs or KORs that were identified in the Submitted EIAR were recorded at this site and no additional significant faunal habitat was recorded. The revegetating cells provided good habitat for reptiles and amphibians. Plate 4-15 shows the nature of Deviation 15. A sitewide geotechnical stability assessment was carried out in October 2023 and found the site to be stable.

Plate 4--15 excavated peat cell at Deviation 15

4.1.1.8.2 *Pre-Construction Habitat/ Environment*

The receiving environment at the site of Deviation 15 prior to any works being undertaken was located partially within the Submitted EIAR study area as set out in the EIAR and the area was shown on the Habitat Map (Reproduced in Figure 4-1) as primarily Conifer Plantation (WD4) with an existing borrow pit and trackway also present. A review of aerial photography and an assessment of the surrounding area confirms that the area that was outside the study area is likely to have been similar Conifer Plantation habitat with dense Sitka spruce and heath type vegetation beneath.

4.1.1.8.3 *European Sites*

Deviation 15 is located within the Bunadaowen Catchment but is approximately 80m from any natural watercourses (The Bunadaowen River). There are forestry drains that provide indirect hydrological connectivity to this watercourse. The River Finn SAC is located within the same catchment, approximately 4km downstream (surface water distance) of this deviation and a potential source-pathway-receptor chain for the effects on the following QI species was identified:

- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

The results of the walkover surveys did not reveal any findings that alter the conclusions of the Submitted NIS. An assessment of the potential for this deviation to result or have resulted in adverse effects on European Sites is provided in Sections Seven and Eight below.

4.1.1.9 Deviation 17 Peat cells near T15

4.1.1.9.1 *Current Conditions*

The site of Deviation 17 was the subject of a comprehensive ecological walkover survey on the 23rd August 2023. The current conditions on the site of Deviation 17 are described below. Since the cessation of peat deposition in the cell, the surface of the deposited peat has revegetated with species including soft rush (*Juncus effusus*) and bulbous rush (*Juncus bulbosus*), which are dominant in the drier areas, particularly in the southern sections of the site of this deviation. In other areas, there is a wetter and more varied flora including Yorkshire fog (*Holcus lanatus*), tormentil (*Potentilla erecta*), ling (*Calluna vulgaris*), *Polytrichum* and *Sphagnum* species. There were pools developing on the surface with species such as bog pondweed (*Potamogeton polygonifolius*) It was best classified as Wet Grassland (GS4) in the drier areas and wet heath (HH3)/Blanket Bog(PB2) in the wetter areas. Three forestry drains were recorded flowing north west out of the site of Deviation 17 and ultimately into a tributary of the Bunadaowen River after a surface water distance of approximately 180m. Whilst no signs of significant pollution were recorded, there was some silt at the base of the cell bunds. The bund walls consisted of earth and rock and were best classified as Recolonising Bare Ground (ED3). No significant habitat for any of the KERs or KORs that were identified in the Submitted EIARwere recorded at this site and no additional significant faunal habitat was recorded. The revegetating cells provided good habitat for reptiles and amphibians. The existing site conditions are shown in Plates 4-16, 4-17, and 4-18. There were some signs of cracking within the bund walls. However, a sitewide geotechnical stability assessment was carried out in October 2023. The assessment found that the peat cells are stable.

Plate 4--16 Drier, rush dominated sections of the site

Plate 4--17 Wet pool developing on top of peat cell

Plate 4--18 Forestry Drain running out of site. Small accumulation of silt at base of bund – no signs of any effects thereafter

4.1.1.9.2 *Pre-Construction Habitat/ Environment*

The receiving environment on the site of Deviation 17 is located entirely within the EIAR study area and was assessed in the submitted EIAR for the permitted development. It is shown on the Habitat Map (Reproduced in Figure 4-1) within the EIAR as comprising of Conifer Plantation (WD4). It was not identified as a KER habitat or an area that provided significant habitat for KER or KOR species. This is consistent with the surrounding habitats in the area, which comprise Sitka spruce dominated conifer plantation.

4.1.1.9.3 *European Sites*

Deviation is located within the Bunadaowen Catchment but is approximately 180m from any natural watercourses. There are forestry drains that provide indirect hydrological connectivity to this watercourse. The River Finn SAC is located within the same catchment, approximately 4.5km downstream (surface water distance) of this deviation and a potential source- pathway-receptor chain for the effects on the following QI species was identified:

- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

The results of the walkover surveys did not reveal any findings that alter the conclusions of the Submitted NIS. An assessment of the potential for this deviation to result or have resulted in adverse effects on European Sites is provided in Sections Seven and Eight below.

4.1.1.10 Deviation 18 Peat cells near T17

4.1.1.10.1 *Current Conditions*

The site of Deviation 18 was the subject of a comprehensive ecological walkover survey on the 23rd August 2023. The current conditions on the site of Deviation 18 are described below. Since the cessation of peat deposition in the cell, the surface of the deposited peat has revegetated with species including soft rush (*Juncus effusus*) and bulbous rush (*Juncus bulbosus*), which are dominant throughout. Other species including Yorkshire fog (*Holcus lanatus*), creeping bent grass (*Agrostis stolonifera*), tormentil (*Potentilla erecta*), ling (*Calluna vulgaris*), *Polytrichum* and *Sphagnum* species. It was best classified as Wet Grassland (GS4) and wet heath (HH3). There were pools developing on the surface of the cell, which supported abundant growth of *Sphagnum* species. The bund walls consisted primarily of bare rock with some revegetation. They were best classified as Recolonising Bare Ground (ED3). Whilst there are forestry drains in the area, there were no obvious flowing drains recorded and no signs of overtopping or pollution. No significant habitat for any of the KERs or KORs that were identified in the Submitted EIAR were recorded at this site and no additional significant faunal habitat was recorded. The revegetating cells provided good habitat for reptiles and amphibians. The existing site conditions are shown in Plates 4-19 and 4-20. There were some signs of cracking within the bund walls. However, a sitewide geotechnical stability assessment was carried out in October 2023. The assessment found that the peat cells are stable.

Plate 4--19 Rush dominated section of the revegetated peat cell

Plate 4--20 Sphagnum dominated pool within the revegetated peat cell

4.1.1.10.2 Pre-Construction Habitat/ Environment

The receiving environment on the site of this deviation is located entirely within the Submitted EIAR study area and was assessed in the Submitted EIAR. It is shown on the Habitat Map (Reproduced in Figure 4-1) within the Submitted EIAR as comprising of Conifer Plantation (WD4) with associated road and track infrastructure. It was not identified as a KER habitat or an area that provided significant habitat for KER or KOR species. This is consistent with the surrounding habitats in the area, which comprise Sitka spruce dominated conifer plantation.

No invasive alien species (IAS) listed on the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011) were identified in this area during the baseline surveys undertaken.

4.1.1.10.3 European Sites

Deviation 18 is located within the Bunadaowen Catchment but is approximately 450m from any natural watercourses. There are forestry drains that provide indirect hydrological connectivity to this watercourse. The River Finn SAC is located within the same catchment, approximately 4km downstream (surface water distance) of this deviation and a potential source- pathway-receptor chain for the effects on the following QI species was identified:

- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

The results of the walkover surveys did not reveal any findings that alter the conclusions of the Submitted NIS. An assessment of the potential for this deviation to result or have resulted in adverse effects on European Sites is provided in Sections Seven and Eight below.

4.1.1.11 Deviation 19 Layby south of T10 with welfare facilities

4.1.1.11.1 *Current Conditions*

The site of Deviation 18 was the subject of a comprehensive ecological walkover survey on the 23rd August 2023. The current conditions on the site of Deviation 18 are described below. The deviation involved a slight enlargement of an existing layby on a forestry road. This may have resulted in additional loss of trees. However the habitats at the site of this deviation include slightly enlarged layby that is classified as Buildings and Artificial Surfaces (BL3). The site of Deviation 18 is surrounded to the north by Conifer Plantation (WD4) and to the south, by the existing and permitted spine road. There is a forestry drain running north from the layby and a tributary of the Bunadaowen is located approximately 20m to the west of the deviation. No significant habitat for any of the KERs or KORs that were identified in the Submitted EIAR were recorded at this site and no additional significant faunal habitat was recorded.

4.1.1.11.2 *Pre-Construction Habitat/ Environment*

The receiving environment on the site of Deviation 18 is located entirely within the Submitted EIAR study area and was assessed in the Submitted EIAR. It is shown on the Habitat Map (Reproduced in Figure 4-1) within the Submitted EIAR as comprising of Conifer Plantation (WD4) with track and associated infrastructure. It was not identified as a KER habitat or an area that provided significant habitat for KER or KOR species. This is consistent with the surrounding habitats in the area, which comprise Sitka spruce dominated conifer plantation.

No invasive alien species (IAS) listed on the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011) were identified in this area during the baseline surveys undertaken.

4.1.1.11.3 *European Sites*

Deviation 18 is located within the Bunadaowen Catchment but is approximately 20m from any natural watercourses. The River Finn SAC is located within the same catchment, approximately 6km downstream (surface water distance) of this deviation and a potential source- pathway-receptor chain for the effects on the following QI species was identified:

- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

The results of the walkover surveys did not reveal any findings that alter the conclusions of the Submitted NIS. An assessment of the potential for this deviation to result or have resulted in adverse effects on European Sites is provided in Sections Seven and Eight below.

4.1.1.12 Deviation 24 Roadside berms and settlement ponds

4.1.1.12.1 *Current Conditions*

The site of Deviation 24 was the subject of a comprehensive ecological walkover survey on the 23rd August 2023. The current conditions on the site of Deviation 24 are described below. This deviation involved the inclusion of water protection measures alongside the permitted infrastructure but outside the permitted footprint. This may have resulted in additional loss of coniferous trees. However the habitats at the site of this deviation include low roadside berms that are recolonising with that is dominated by soft rush (*Juncus effuses*) and bulbous rush (*Juncus bulbosus*). There are also numerous grey willow (*Salix cinerea*) seedlings on these berms and it is likely that it will ultimately succeed to willow scrub (WS1) and woodland habitat. The settlement ponds and aquatic features are best classified as drainage ditches a(FW4) and small Artificial Ponds (FL8). The elements of this deviation almost all surrounded by Conifer Plantation (WD4) but are strongly associated and contiguous with the permitted infrastructure. They are located in the Bunadaowen catchment. No significant habitat for any of the KERs or KORs that were identified in the Submitted EIAR were recorded at this site and no additional significant faunal habitat was recorded. The recolonising habitats will provide likely provide scrub and wetlands that will provide good habitat for amphibians and reptiles. Plate 4-21 below shows the roadsdie berms in December 2023.

Plate 4--21 Revegetated roadside berm, December 2023.

4.1.1.12.2 *Pre-Construction Habitat/ Environment*

The receiving environment on the site of Deviation 24 is located entirely within the Submitted EIAR study area and was assessed in the Submitted EIAR. . It is shown on the Habitat Map (Reproduced in Figure 4-1) within the Submitted EIAR as comprising of Conifer Plantation (WD4) along with forestry roads and infrastructure. The area was not identified as a KER habitat or an area that provided

significant habitat for KER or KOR species. This is consistent with the surrounding habitats in the area, which comprise Sitka spruce dominated conifer plantation.

No invasive alien species (IAS) listed on the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011) were identified in this area during the baseline surveys undertaken.

4.1.1.12.3 *European Sites*

The River Finn SAC is located at closest approximately 4km downstream of Deviation 24 and a potential source- pathway-receptor chain for the effects on the following QI species was identified:

- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

The results of the walkover surveys did not reveal any findings that alter the conclusions of the NIS for the Permitted Development. An assessment of the potential for the deviation to result or have resulted in adverse effects on European Sites is provided in Sections Seven and Eight below.

4.1.1.13 Deviation 25 Additional excavated borrow pit and peat storage cell at T13

4.1.1.13.1 *Current Conditions*

The site of Deviation 25 was the subject of a comprehensive ecological walkover survey on the 23rd August 2023. The current conditions on the site of Deviation 25 are described below. Since the cessation of peat deposition in the cell, the surface of the deposited peat has revegetated with species including soft rush (*Juncus effusus*) and bulbous rush (*Juncus bulbosus*), which are dominant throughout. Other species including Yorkshire fog (*Holcus lanatus*), creeping bent grass (*Agrostis stolonifera*), tormentil (*Potentilla erecta*), ling (*Calluna vulgaris*), *Polytrichum* and *Sphagnum* species. It was best classified as Wet Grassland (GS4) and wet heath (HH3). There were pools developing on the surface of the cell, which supported abundant growth of *Sphagnum* species. The bund walls consisted primarily of bare rock with some revegetation. They were best classified as Recolonising Bare Ground (ED3). Whilst there are forestry drains in the area, there were no obvious flowing drains recorded and no signs of overtopping or pollution. No significant habitat for any of the KERs or KORs that were identified in the Submitted EIAR were recorded at this site and no additional significant faunal habitat was recorded. The revegetating cells provided good habitat for reptiles and amphibians. A sitewide geotechnical stability assessment was carried out in October 2023. The assessment found that the borrow pit and peat cells are stable.

4.1.1.13.2 *Existing Pre-Construction Habitat/ Environment*

The receiving environment on the site of this deviation is located entirely within the Submitted EIAR study area and was assessed in the Submitted EIAR. It is shown on the Habitat Map (Reproduced in Figure 4-1) within the Submitted EIAR as comprising of Conifer Plantation (WD4) with associated road and track infrastructure. It was not identified as a KER habitat or an area that provided significant habitat for KER or KOR species. This is consistent with the surrounding habitats in the area, which comprise Sitka spruce dominated conifer plantation.

No invasive alien species (IAS) listed on the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011) were identified in this area during the baseline surveys undertaken.

4.1.1.13.3 *European Sites*

Deviation 25 is located within the Bunadaowen Catchment but is approximately 930m from any natural watercourses. There are forestry drains that provide indirect hydrological connectivity to this watercourse. The River Finn SAC is located within the same catchment, approximately 4.7km downstream (surface water distance) of this deviation and a potential source- pathway-receptor chain for the effects on the following QI species was identified:

- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

The results of the walkover surveys did not reveal any findings that alter the conclusions of the Submitted NIS. An assessment of the potential for this deviation to result or have resulted in adverse effects on European Sites is provided in Sections Seven and Eight below.

4.1.1.14 Site Roads and Hardstand Areas

The components of the Subject Development that include deviations 5, 8, 9, 12, 13, 14, 16, 20, 21, 22, and 23, are all similar in nature and scale, and are concerned with either slightly relocated/realigned access roads or deviations that were built using the same methodology such as laybys (Deviation 20) or turning heads (Deviation 16). All of these were visited, surveyed and assessed but are all very similar in nature and located in close alignment with the permitted infrastructure. They are not individually described in this section, but are grouped together and represent slight deviations from the permitted infrastructure with little potential for resultant ecological effects.

4.1.1.14.1 *Current Conditions*

The sites of these deviations were the subject of a comprehensive ecological walkover survey on the 23rd and 24th August 2023. The current conditions on the sites of these deviations are described below. The deviations all involved a slight realignment of the permitted infrastructure. This may have resulted in additional loss of trees in some places, though in the majority, it involved the same or less than was assessed in the Submitted EIARt but in a slightly altered (but adjacent) location. The habitats at the sites of these deviations include new infrastructure in a slightly altered position that is generally classified as Buildings and Artificial Surfaces (BL3) and a surrounding area that has been cleared of Conifer Forestry and is now recolonising with vegetation that is dominated by soft rush (*Juncus effuses*), bulbous rush (*Juncus bulbosus*) and bryophytes with saplings of grey willow (*Salix cinreea*). In many cases it also includes heath vegetation including Sphagnum mosses, and Ling (*Calluna vulgaris*). It is likely that in many areas the surrounding vegetation will succeed to willow scrub and woodland. The sites of these deviations are all surrounded by Conifer Plantation (WD4), clear felled forestry and permitted forestry and wind farm infrastructure. The sites of these deviations are located within two three separate sub-catchments. Deviations 5,12,13,14,16,20, 21 and 24 are located in the Bunadaowen sub catchment of the Mourne Beg River. Deviations 22 and 23 are located in the Shruhangarve sub catchment of the Mourne Beg River. Deviations 8 and 9 are located in the catchment of the Glendergan River. None of the works associated with any of these deviations involved any works within any natural watercourses, though indirect connectivity to these watercourses may be provided through forestry drains in the area. No significant habitat for any of the KERs or KORs that were identified in the Submitted EIAR were recorded at these sites and no additional significant faunal habitat was recorded. The recolonising habitats will likely provide scrub and wet woodland habitat in the future. An example of the typical existing site conditions at these deviations are shown in Plates 4-22. and 4.23.

Plate 4--22 Site of minor deviation at Deviation 13 – road constructed on route of existing road instead of making new (adjacent road)

Plate 4--23 Site of minor deviation at Deviation 6 – road constructed approximately 30m downslope of the permitted to avoid excessive cut

4.1.1.14.2 *Pre-Construction Habitat/ Environment*

The receiving environments on the sites of these deviations are located entirely within the Submitted EIAR study area and were assessed in the Submitted EIAR. They are shown on the Habitat Map (Provided as Figure 4-1) within the Submitted EIAR as comprising of Conifer Plantation (WD4) and associated forestry infrastructure. They were not identified as a KER habitat or areas that provided significant habitat for KER or KOR species. This is consistent with the surrounding habitats in these areas, which comprise Sitka spruce dominated conifer plantation, clear felled conifer plantation and forestry infrastructure.

No invasive alien species (IAS) listed on the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011) were identified in these areas during the baseline surveys undertaken.

4.1.1.14.3 *European Sites*

Deviations 8 and 9 are located within the Glendergan River Catchment and are at closest 45m from any natural watercourses. The River Foyle and Tributaries SAC [UK0030320] is located within the same catchment, approximately 500m downstream (surface water distance) of these deviations and a potential source- pathway-receptor chain for the effects on the following QI species was identified:

- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]
- Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callicricho-Batrachion* vegetation

The other deviations are located within the Mourne Beg (Bunadaowen and Shruhangarve) Catchments but are over from any natural watercourses. There are forestry drains that provide indirect hydrological connectivity to these watercourses. The River Finn SAC is located within the same catchment and is at closest, approximately 2.5km downstream (surface water distance) of any of these deviations (Closest is deviation 29 – via the Shruhangarve). A potential source- pathway-receptor chain for the effects on the following QI species was identified:

- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

The results of the walkover surveys did not reveal any findings that alter the conclusions of the Submitted NIS. An assessment of the potential for these deviations to result or to have resulted in adverse effects on European Sites is provided in Sections 7 and 8 below.

4.2 Results of Peat Stability Surveys

4.2.1 Results of 2021 surveys

The Fehily Timoney Report states amongst its summary, that:

> *"A site-wide peat stability hazard zoning using geomorphological plans has been carried out to provide guidance on potential peat instability. The results of the peat stability hazard zoning should be read in conjunction with the previous stability assessment for the site (AGEC 2017). Detailed design will need to be carried out to determine the stability of any works."*

And

> *"The results of the peat stability hazard assessment have been used to provide an assessment of the risk that may arise as a result of peat failure. Taking account of the remaining works and stability of the site, recommendation have been produced, and presented (in the FTC report), to allow for the safe completion of the works."*

The Ionic 2021 Report provides a stability analysis of on-site roads, hardstandings, turbine foundations, peat storage areas, peat sidecasting and deposition areas, peat stabilisation areas, substation and an assessment of remaining works. The Ionic 2021 Report states amongst its conclusions, that:

> *"All factors of safety across the site were found to be in excess of 1.3 with the exception of a short section of the T4 floating road. This section of floating road will be upgraded as outlined in Section 3.8.7. Ionic Consulting can therefore confirm that the overall site is currently stable based upon this detailed assessment carried out along all roads, hardstandings, borrow pits, peat storage areas and peat stabilisation areas".*

4.2.2 Results of 2023 Surveys

AFRY prepared a Site Inspection Technical Note documenting the findings of the site visit. In October 2023. A copy of the Inspection Note is included as Appendix 4-1 to this report. The Technical note finds that the overall site is currently stable based upon the assessment carried out along all roads, hardstanding's, borrow pits, peat storage areas and peat stabilisation areas.

4.3 Results of Water Quality Monitoring

4.3.1 Desktop Assessment

4.3.1.1 EPA Monitoring

Results of the relevant EPA sampling stations of Q-values are presented below in figures 4-2 to -4-4. EPA sampling showed that water quality in associated waterbodies was stable or increasing throughout the construction period. Note that limited data was available for 2020 due to the Global Pandemic with the SARS-CoV-2 virus.

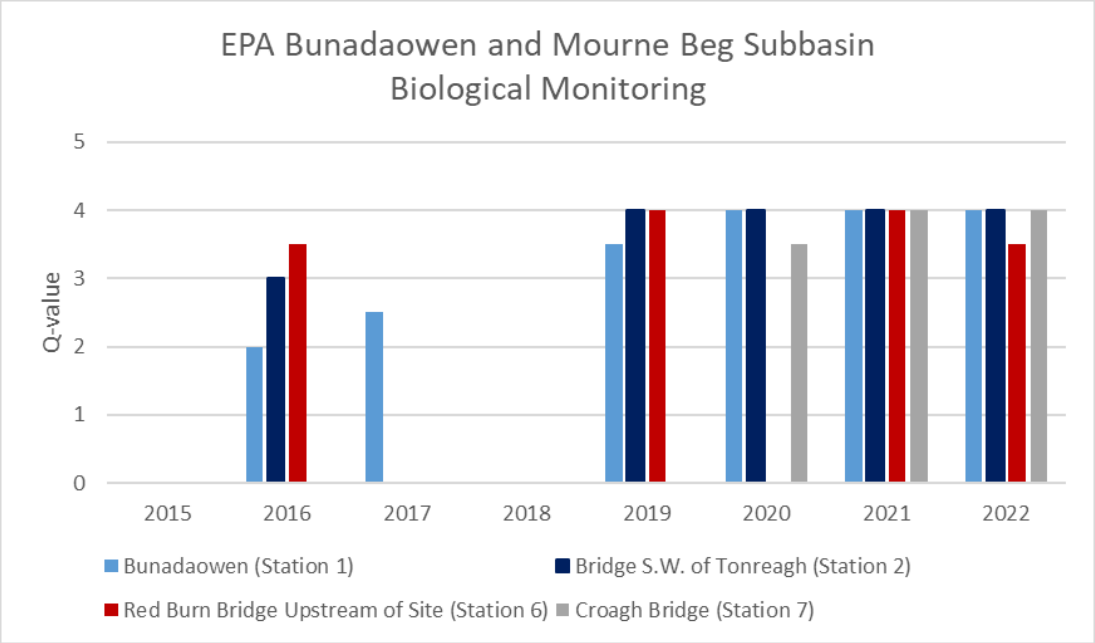


Figure 4-2 Q-Values Bunadaowen and Mourne Beg EPA Monitoring 2015-2022.

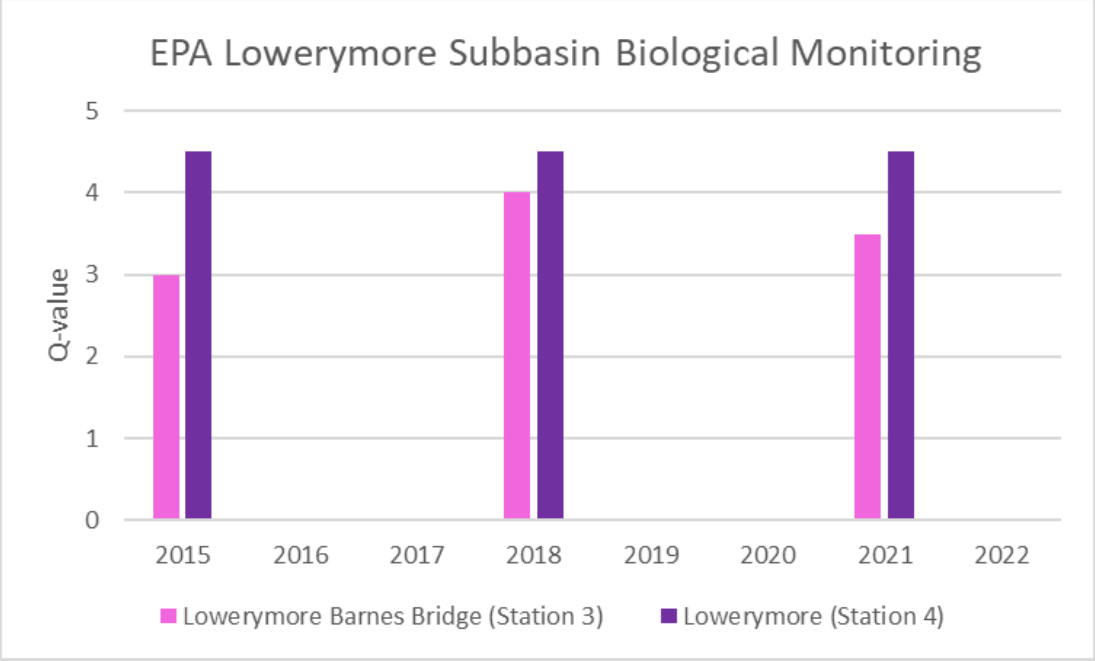


Figure 4-3 Q-Values Lowerymore EPA Monitoring 2015-2022.

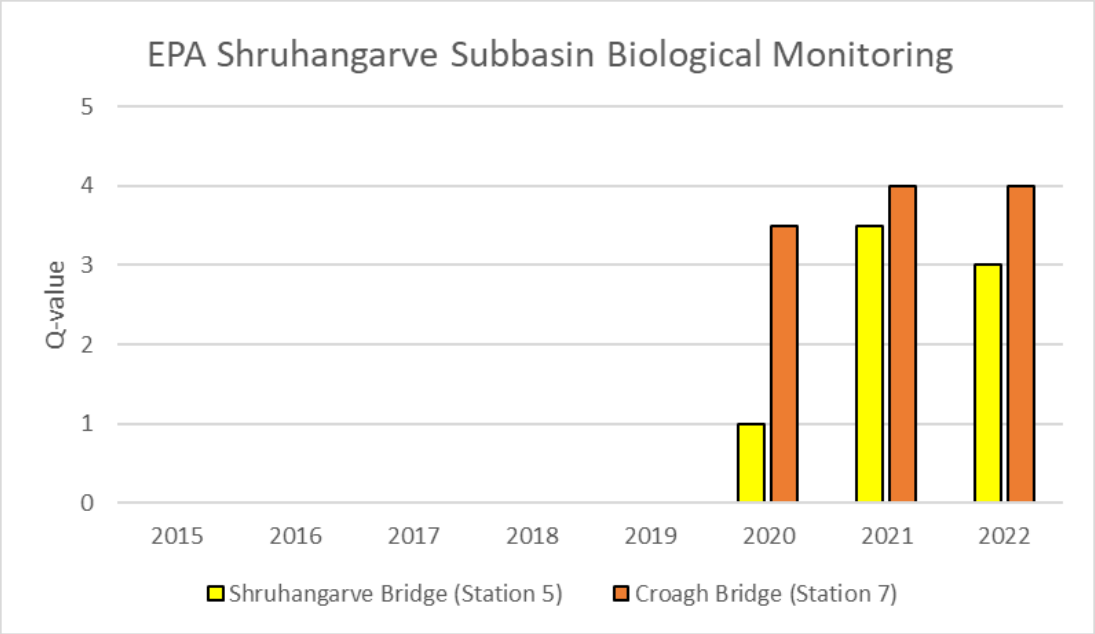


Figure 4-4 Q-Values Shruhangarve EPA Monitoring 2015-2022.

4.3.1.2 Northern Ireland Environment Agency Monitoring

The Glendergan River was classified in 2015 and 2018 as 'Moderate' and in 2021 as 'Poor' ecological status. In 2021, due to the inclusion of 'forever' chemicals and Cybermethrin in the assessment process, none of the assessed water bodies met good or high 'Overall Surface Water Status', which in turn decreased ecological status classification of most catchments in Northern Ireland. The decrease in ecological status in the Glendergan River is a result of change in assessment methodology, rather than being attributed to activities at the Meenbog Windfarm site. This is also highlighted in the NIEA's *Northern Ireland Water Framework Directive Statistics Report* 2021.

For surface waters, ecological status is assessed against five classes: bad; poor; moderate; good; and high. Chemical status surface water bodies are assessed against two classes: good and failing to achieve good. When river water quality was assessed without 'forever' chemicals in Glendergan river, it was assigned status 'Good' in 2021, an improvement from the 2015 and 2018 classification, when it was classed as 'Moderate'. No significant residual impacts to surface water quality occurred in the Glendergan catchment as a result of construction activities at the Meenbog Windfarm. Water quality in the Glendergan River has improved during construction period of the Permitted Development and the Subject Development.

4.3.2 Project Water Monitoring Programme

Results from the project monitoring programme are in line with findings from the EPA and show that the construction did not have any significant effects on water quality. There was no significant negative continuous impact in any of the monitored parameters. Whenever a spike in data was recorded, the issue resulting in elevated turbidity was identified, addressed on site and swiftly resolved wherever possible. Further results are presented below.

4.3.2.1 Visual Checks

Since construction commenced in late 2019, over 230 visual check sheets were filled out until March 2021. Daily visual checks noted any localised increases in turbidity in onsite water courses, general site conditions, and recorded mitigation measures necessary as outlined in the CEMP or discussed with the relevant personnel such as site hydrologist, geologist, or site manager. Copies of the daily visual check sheets are included as Appendix 4-2 of this report.

4.3.2.2 Surface Water Chemistry Monitoring

Results from monthly surface water chemistry monitoring from September 2019 to February 2023 are provided in table 4-1. The table shows no sustained increase in any of the tested parameters throughout the survey period.

There were a limited number of short terms increases in the recorded levels of some parameters at some sampling sites. These short-term increases are described below.

- Elevated levels of Nitrate, Nitrite, Ammonia and Ammonium were recorded at SW4 on the 24th of April 2020. All other water sampling results stable on this date. Levels had returned to baseline levels by the following sampling event.
- An elevated level of Biological Oxygen Demand (BOD) was recorded at SW3 on the 6th of August 2020. The level was elevated above baseline for this site but was still below the EQS.
- Elevated levels of Orthophosphate were recorded across all sampling stations in the monthly samples from March, April, and June 2020. Levels subsequently returned to baseline.
- Elevated levels of Orthophosphate were recorded at SW1 in December 2020. Levels had returned to baseline levels by the following sampling event.

- Elevated levels of Orthophosphate were recorded at SW4 in November 2021. Levels had returned to baseline levels by the following sampling event.

All measured parameters have returned to pre-construction baseline levels indicating that there is no ongoing effect on water chemistry in receiving water bodies as a result of the Meenbog Windfarm.

Table 4--1: Water Quality Monitoring During and Post Construction

Sampling Location ID	Watercourse	SS	BOD	Ammonium	Ammonia	Ortho-P	Nitrite	Nitrate	Chloride	Total P
		mg/l	mg/l	$mgNH_4/l$	$mgNH_3/l$	$mgPO_4/l$	$mgNO_4/l$	$mgNO_3/l$	mgCl/l	mgP/l
SW1	Bunadaowen	1 - 10	1	0.03 – 0.09	0.03 – 0.08	0.03 – 0.12	0.02	0.2 – 0.3	4 – 38.5	0.005 – 0.41
SW2	Bunadaowen	1 - 68	1	0.03 – 0.1	0.03 – 0.09	0.03 – 0.06	0.02	0.2 – 1.3	4.7 – 38.5	0.005 – 0.047
SW3	Bunadaowen	1 - 10	1 - 2	0.03 – 0.14	0.03 – 0.13	0.03 – 0.06	0.02	0.2 – 1.5	5.8 – 41.8	0.005 – 0.065
SW4	Mary Breen's Burn	1 - 10	1	0.03 – 1.91	0.03 – 1.8	0.03 – 0.06	0.02 – 0.31	0.2 – 30.8	5.1 – 37.7	0.005 – 0.052
EQS		≤25[1]	High: ≤2.2 (95%ile)[2]	≤1[(4)]	High: ≤0.09 (95%ile)[(2)]	High: ≤0.045(95%ile)[(2)]	≤0.05[(4)]	37.5[3]	250[(4)]	0.4[(6)]
No. Samples		147	147	147	147	147	147	147	147	147
No. Exceedances		1	0	3	4	16	1	0	0	0
% Compliant		99.3	100	97.9	97.3	89	99.3	100	100	100

[1] *S.I. 293/2988: European Communities (Quality of Salmonid Waters) Regulations*
[2] *S.I. 272/2009. Surface Water Regulations*
[3] *WFD Ireland Threshold for Good Water Quality Status*

4.3.2.3 Biological Monitoring

4.3.2.3.1 *Baseline*

Sampling was undertaken at five locations within and downstream of the development site in September 2014 to assess aquatic macroinvertebrates for Q-Value determination prior to construction commencing. The locations of these sample points are shown in Figure 3-3. No sample point was taken on the Shruhangarve and therefore no baseline data is included in Figure 4-5. Q-value results from the baseline monitoring were consistent with published EPA assessments as presented in Section 4.2.1.

- Sample point 1 was taken upstream of most deviations in the Bunadaowen river and was assigned a Q value of 3-4.
- Sample Point 2 was taken just before Mary Breen's Burn flows into Croaghonagh bog SAC and was assigned a Q value of 3-4.
- Sample Point 3 was taken on the Lowerymore river close to the site entrance and was assigned a Q value of 3-4.
- Sample Point 4 was taken on the Mary Breen's Burn downstream of Croaghonagh Bog SAC and immediately upstream of its confluence with the Mourne Beg River. It was assigned a Q value of 3-4.
- Sample Point 5 was taken downstream of the Bunadaowen river on the Mourne Beg, in the same Location as Sample Point 'M3'. It was assigned a Q-Value of 3-4.

No baseline monitoring was undertaken on the Shruhangarve. The baseline Q-values above have been integrated into the results graphs in Section 5 to provide context to the monitoring results.

4.3.2.3.2 *Biological Water Quality Assessment (Q-value) Results*

Biological water quality assessment (Q-value) was undertaken in in 2020, 2021 and 2023. Full Biological water quality assessment (Q-value) reports for 2020, 2021, and 2023 are provided in Appendices 4-1, 4-2, and 4-3 respectively and are summarised in Figures 4-5 to 4-7 below.

Bunadaowen River

Baseline monitoring conducted in 2014 assigned a Q-value of **Q3-4 (moderate status**) to the Bunadaowen River. Aquatic macroinvertebrate sampling for Q-Value determination conducted in 2020, 2021, and 2022 indicate that the Bunadaowen obtained **Q4 (good status)** and thus also met the requirements of the of the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 and the Water Framework Directive (2000/60/EC). The water quality status of the Bunadaowen River has therefore increased from the pre-construction baseline as shown in Figure 4-5 below.

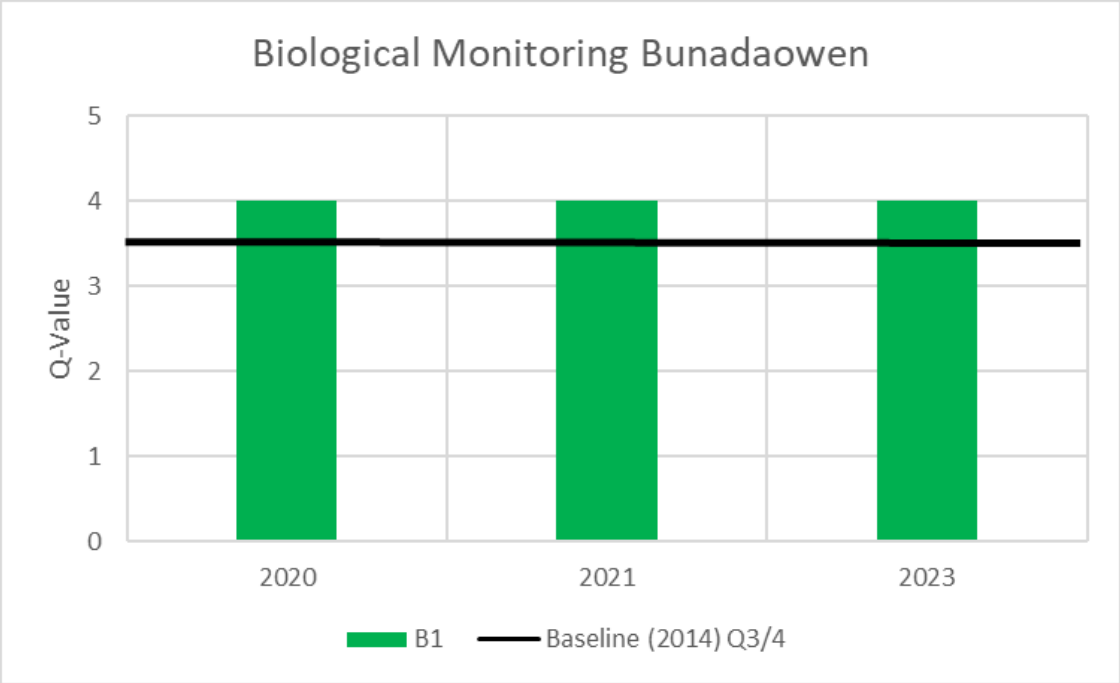


Figure 4-5 Q Value Results Bunadaowen - Project Monitoring 2020-2023

Mourne Beg River

Baseline monitoring conducted in 2014 assigned a Q-value of **Q3-4 (moderate status**) to the Mourne Beg River. Aquatic macroinvertebrate sampling for Q-Value determination conducted in 2020, 2021, and 2022 indicate a trend of increasing water quality in the Mourne Beg River. Q-value results for each monitoring location are summarised below:

- Sample location M1 obtained **Q3-4 (moderate status**) in 2021 and obtained **Q4 (good status)** in 2023 indicating an improvement in water quality.
- Sample location M2 obtained **Q4 (good status**) in 2020 and maintained **Q4 (good status)** in 2022. Sampling at this location was not possible in 2023 due to high water levels.
- Sample location M3 obtained **Q4 (good status**) in 2020 and 2021 and obtained **Q4-5 (high status)** in 2023 indicating an improvement in water quality.
- Sample location M3 obtained **Q4 (good status**) in 2020 and obtained **Q4-5 (high status)** in 2021 indicating an improvement in water quality. Sampling at this location was not possible in 2023 due to high water levels.
- Sample location M1 obtained **Q3-4 (moderate status**) in 2020 and obtained **Q4-5 (high status)** in 2021 and 2023 indicating an improvement in water quality.

The results indicate that the Mourne Beg River has been achieving a minimum of **Q4 (good status)** at all monitoring locations since 2021 and thus also met the requirements of the of the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 and the Water Framework Directive (2000/60/EC). The water quality status of the Mourne Beg River has increased from the pre-construction baseline as shown in Figure 4-6. below.

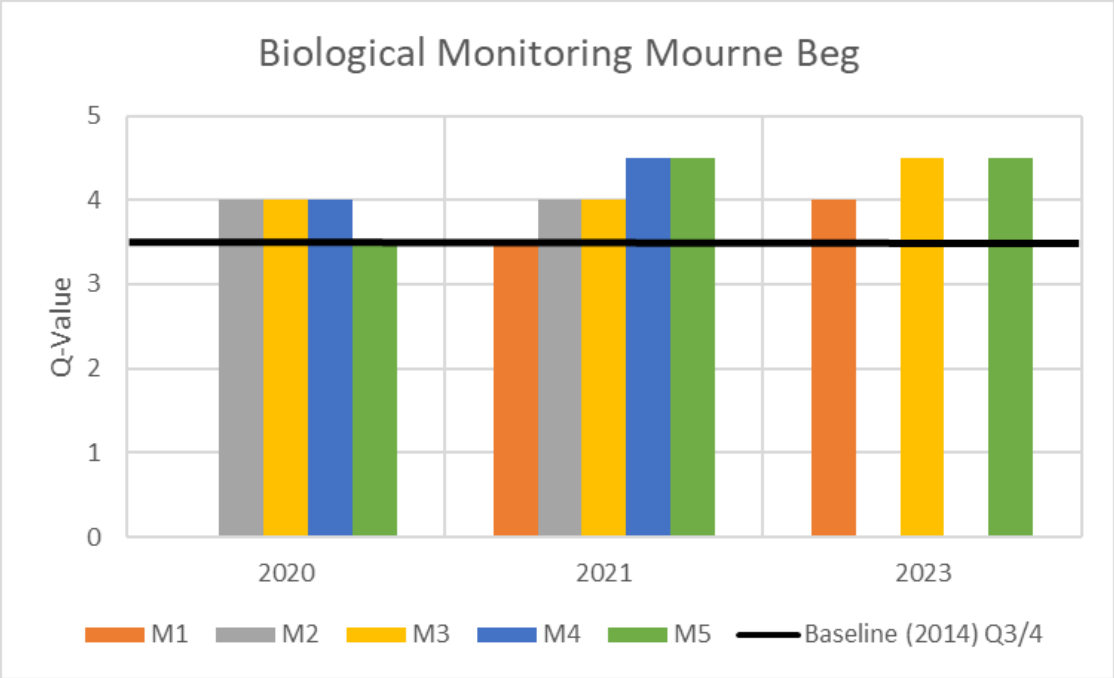


Figure 4-6 Q-Value Results Mourne Beg Project Water Quality Monitoring 2020-2023

Shruhangarve

Aquatic macroinvertebrate sampling for Q-Value determination conducted in 2021, and 2023 indicate that the Shruhangarve obtained **Q3-4 (moderate status)** in 2021 and **Q4 (good status)** in 2023 and thus also met the requirements of the of the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 and the Water Framework Directive (2000/60/EC). These results indicate a continuing improving trend in the water quality status of the Shruhangarve following the peatslide event in November 2020. Results of biological water quality assessments in the Shruhangarve are shown in Figure 4-7, below.

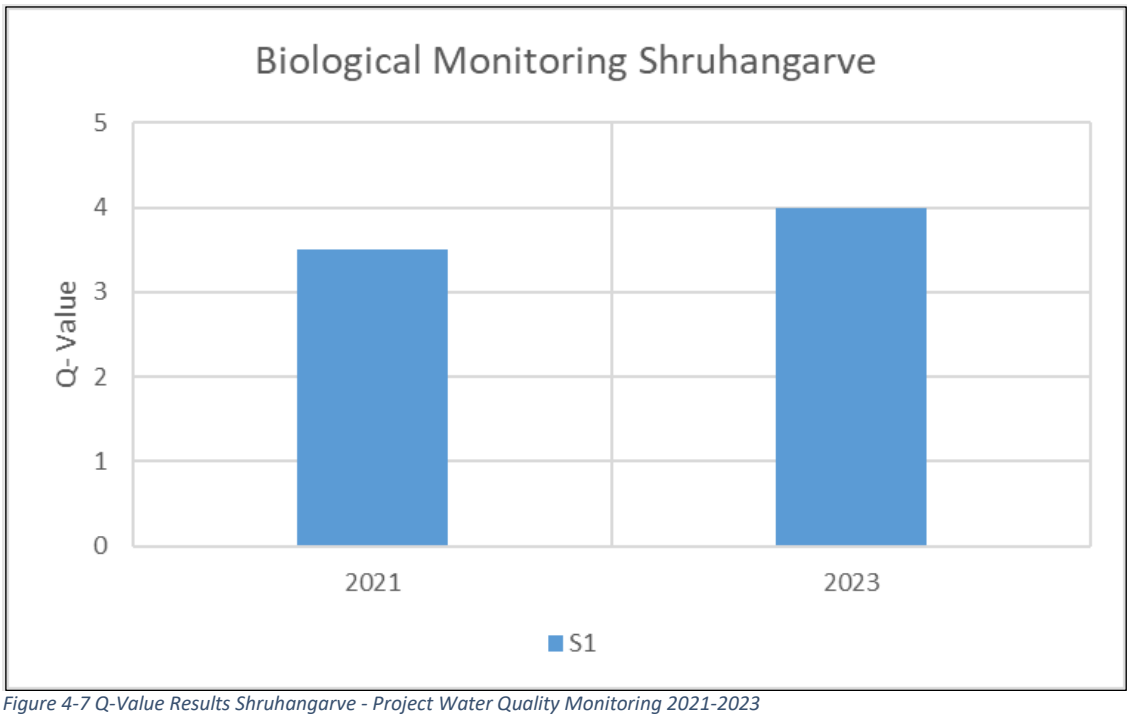
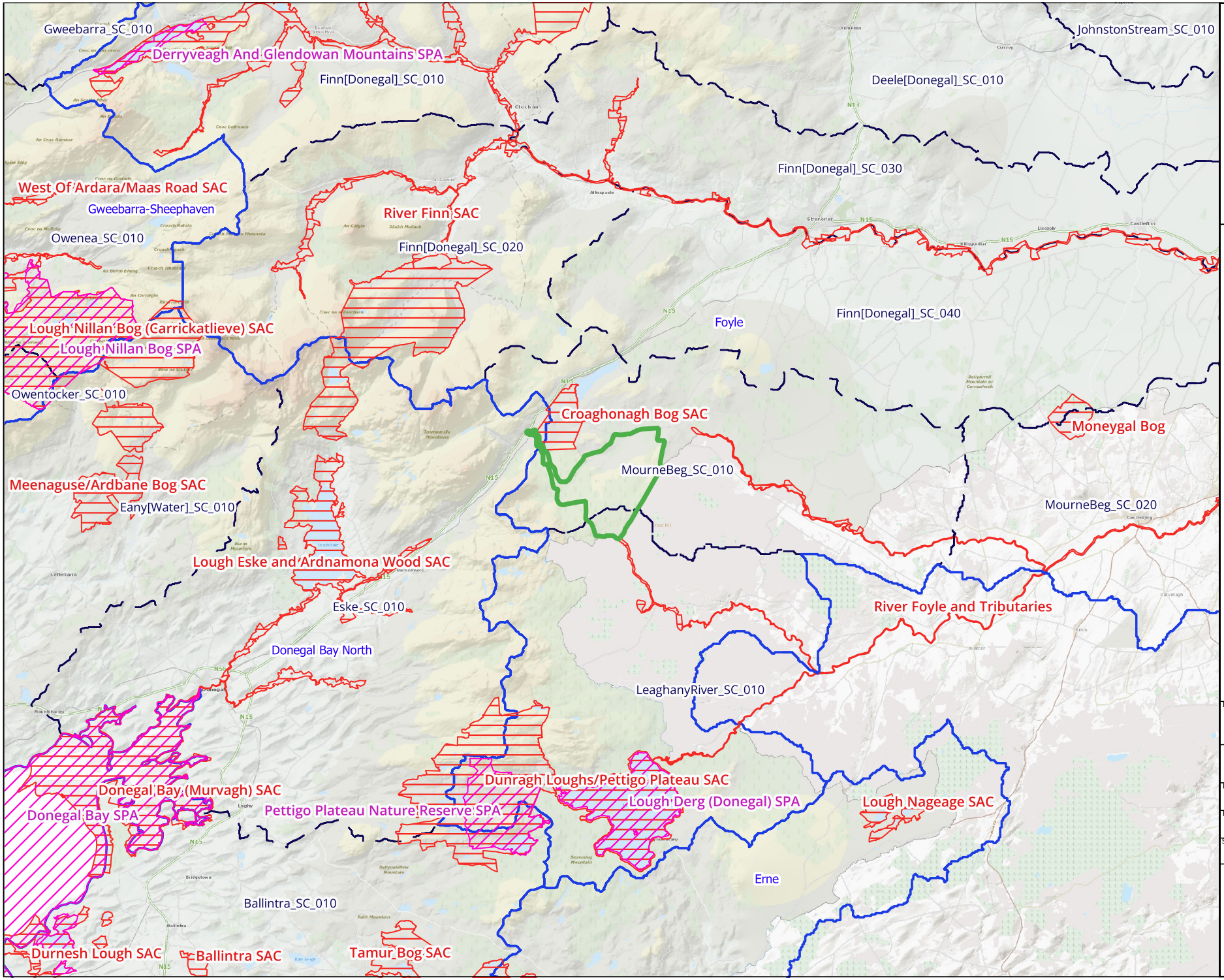


Figure 4-7 Q-Value Results Shruhangarve - Project Water Quality Monitoring 2021-2023

5. STAGE 1 -IDENTIFICATION OF RELEVANT EUROPEAN SITES (SCREENING)

The following methodology was used to establish any European Sites upon which there is a potential for a likely significant effect to occur or to have occurred either individually or in combination with other plans and projects as a result of the Subject Development:

- Initially the most up to date GIS spatial datasets for European designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) on the 20/01/2024.
- All European Sites that could potentially be affected or have been affected were identified using a source-pathway - receptor model. To provide context for the assessment, European Sites surrounding the development site are shown on Figure 5-1. Information on these European Sites according to the site-specific conservation objectives is provided in Table 5-1. European Sites that were further away from the Subject Development were also considered and no complete source-pathway-receptor chain for significant effect was identified for any other European Site.
- The catchment mapping was used to establish or discount potential hydrological connectivity between the site of the Subject Development and any European Sites. The hydrological catchments are also shown in Figure 5-1.
- In relation to Special Protection Areas, in the absence of any specific European or Irish guidance in relation to such sites, the Scottish Natural Heritage (SNH) Guidance, '*Assessing Connectivity with Special Protection Areas* (SPA)' (2016) was consulted. This document provides guidance in relation to the identification of connectivity between Subject Development and Special Protection Areas. The guidance takes into consideration the distances species may travel beyond the boundary of their SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects.
- Table 5-1, provides details of all relevant European Sites as identified in the preceding steps and assesses the potential for likely significant effects on each.
- The assessment considers any likely direct or indirect impacts of the Subject Development, both alone and in combination with other plans and projects, on European Sites by virtue of criteria including the following: size and scale, land-take, distance from the European Site or key features of the site, resource requirements, emissions, excavation requirements, transportation requirements and duration of construction, operation and decommissioning were considered in this assessment.
- The site synopses and conservation objectives of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report 20/10/2023.
- Where potential pathways for Likely Significant Effect are identified, the European Site is included within the Likely Zone of Impact and further assessment is required within the rNIS.



Map Legend

- rEIAR Study Area
- EPA Hydrological Catchments
- EPA Hydrological Subcatchments
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)

Drawing Title
European Designated Sites Within the Likely Zone of Influence

Project Title
Substitute Consent for Deviations at Meenbog Windfarm

Drawn By	Checked By
RM	CM
Project No.	Drawing No.
220623	Figure 5-1
Scale	Date
1:175,817	28/03/2024

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Table 5-1 Identification of European Sites within the Likely Zone of Impact

European Sites and distance from Subject Development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 20/10/2023	Conservation Objectives	Identification of Source-Pathway-Receptor chain
Special Areas of Conservation (SAC)			
River Finn SAC [002301] **Distance:** 1.1km	Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Northern Atlantic wet heaths with *Erica tetralix* [4010] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355]	Detailed conservation objectives for this site, (Version 1, November 2017), were reviewed as part of the assessment and are available at www.npws.ie	The Subject Development is located entirely outside this European Site, with the study area separated from it by a minimum distance of 1.1km. There is no potential for the any of the deviations which comprise the Subject Development to result or have resulted in any direct effect on this European Site. The Subject Development elements are commensurate with those previously assessed as part of the Permitted Development proposal. The alterations do not give rise to the need for any additional mitigation or best practice measures to be applied to avoid or reduce impacts on European Sites. However, following a precautionary approach, a complete source pathway receptor chain was identified in the form of surface water connectivity between a number of the components of the Subject Development that are located in the Bunadaowen and Shruhangarve Catchments and the River Finn SAC. No other pathway for Likely Significant Effects on this SAC was identified.

			Due to the presence of a source-pathway- receptor chain in the form of potential surface water connection, the potential for likely significant effects on this SAC as a result of the Subject Development both on its own and in combination with other plans and projects cannot be excluded.
River Foyle and Tributaries SAC [UK0030320] **Distance:** Adjacent to the Subject Development Study Area	*Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355] Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callicricho-Batrachion* vegetation	Maintain and if possible expand existing population numbers and distribution (preferably through natural recruitment), and improve age structure of population. Maintain and if possible enhance the extent and quality of suitable Salmon habitat - particularly the chemical and biological quality of the water and the condition of the river channel and substrate. (DOENI V3, 2017)	The Subject Development is located entirely outside this European Site and although the Site is located adjacent to this European Site, none of the deviations are located in the vicinity of this boundary. There is no potential for the deviations to result or have resulted in any direct effect on this European Site. The Subject Development elements are commensurate with those previously assessed as part of the Permitted Development proposal. The small-scale alterations do not give rise to the need for any additional mitigation or best practice measures to be applied to avoid or reduce impacts on designated sites. However, following a precautionary approach, a complete source pathway receptor chain was identified in the form of surface water connectivity between a number of the Subject development elements that are located in the Glendergan catchment and the River Foyle and Tributaries SAC No other pathway for Likely Significant Effects on this SAC was identified. **Due to the presence of a source-pathway- receptor chain in the form of potential surface water connection, the potential for likely significant effects on this SAC as a result of the Subject Development both on its own and in combination with other plans and projects cannot be excluded.**

Croaghonagh Bog SAC [000129] **Distance:** Adjacent to the Site	Blanket bogs (* if active bog) [7130]	Detailed conservation objectives for this European Site (Version 1, May 2017) were reviewed as part of the assessment and are available at www.npws.ie	The Subject Development is located entirely outside this European Site and although the windfarm study area is located adjacent to this European Site, none of the deviations are located within the SAC. There is no potential for the Subject Development to result in or to have resulted in any direct effect on this European Site. The Subject Development elements are commensurate with those previously assessed as part of the Permitted Development proposal. The alterations do not give rise to the need for any additional mitigation or best practice measures to be applied to avoid or reduce impacts on designated sites. The works were undertaken at a lower elevation than the than the SAC, further away from the SAC than the Permitted Development and buffered from it by the existing road. No complete source-pathway-receptor chain for the works to result or have resulted in any Likely Significant Effects on this SAC were identified **The potential for the Subject Development to result in or to have resulted in any Likely Significant Effects on the integrity of this SAC either on its own and in combination with other plans and projects can be excluded.**
Lough Eske and Ardnamona Wood SAC [000163]	Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Petrifying springs with tufa formation (*Cratoneurion*) [7220]	Detailed conservation objectives for this European Site (Version 1, September 2019) were reviewed as part of the assessment and are available at www.npws.ie	The Subject Development is located entirely outside this European Site and is separated from it by a distance of at least approximately 6.4km (surface water distance). There is no potential for the Subject Development to result in or to have resulted in any direct effect on this European Site.

Distance: 4.7km (6.4km surface water distance)	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] Salmo salar (Salmon) [1106] *Trichomanes speciosum* (Killarney Fern) [1421]		The Subject Development elements are commensurate with those previously assessed as part of the Permitted Development proposal. The alterations do not give rise to the need for any additional mitigation or best practice measures to be applied to avoid or reduce impacts on designated sites. However, following a precautionary approach, a complete source pathway receptor chain was identified in the form of surface water connectivity between a number of the Subject Development elements that are located in the Loweymore catchment and the River Foyle and Tributaries SAC No other pathway for Likely Significant Effects on this SAC was identified. **Due to the presence of a source-pathway- receptor chain in the form of potential surface water connection, the potential for likely significant effects on this SAC as a result of the Subject Development both on its own and in combination with other plans and projects cannot be excluded.**
Dunragh Loughs/Pettigo Plateau SAC [001125] **Distance:** 6.2km	Northern Atlantic wet heaths with *Erica tetralix* [4010] Blanket bogs (* if active bog) [7130]	Detailed conservation objectives for this European Site (Version 1, May 2017) were reviewed as part of the assessment and are available at www.npws.ie	The Subject Development is located entirely outside this European Site and is separated from it by a distance of 6.2km. There is no potential for the Subject Development to result in or to have resulted in any direct effect on this European Site. **This European Site has no hydrological connectivity with the study area. No complete source-pathway-receptor chain for the Subject Development to result or have resulted in Likely Significant Effects on this SAC was identified.**

Moneygal Bog SAC [UK0030211] **Distance:** 13.6km	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the *Rhynchosporion* [7150]	Conservation objective document V2 2014. Maintain the extent of intact lowland raised bog and actively regenerating raised bog vegetation. Maintain and enhance the quality of the lowland raised bog community types including the presence of notable species. Seek to expand the extent of actively regenerating raised bog vegetation into degraded (non-active) areas of cutover bog. Maintain the diversity and quality of other habitats associated with the active raised bog, e.g. acid grassland, fen and swamp, especially where these exhibit natural transition to the raised bog. Maintain the hydrology of the raised bog peat mass. Seek nature conservation management over suitable areas immediately outside the SAC where there may be potential for lowland raised bog rehabilitation.	The Subject Development is located entirely outside this European Site and is separated from it by a distance of 13.6km. There is no potential for the Subject Development to result in or to have resulted in any direct effect on this European Site. **This European Site is located in a separate hydrological catchment. No complete source-pathway-receptor chain for the Subject Development to result or have resulted in Likely Significant Effects on this SAC was identified.**
Lough Nageage SAC [002135] **Distance:** 12.9km	*Austropotamobius pallipes* (White-clawed Crayfish) [1092]	Detailed conservation objectives for this European Site (Version 1, March 2021) were reviewed as part of the assessment and are available at www.npws.ie	The Subject Development is located entirely outside this European Site and is separated from it by a distance of 12.9km. There is no potential for the Subject Development to result in or to have resulted in any direct effect on this European Site.

			This European Site is located in a separate hydrological catchment. No complete source-pathway-receptor chain for the Subject Development to result or have resulted in Likely Significant Effects on this SAC was identified.
Meenaguse Scragh SAC [001880] **Distance:** 12.1km	Northern Atlantic wet heaths with Erica tetralix [4010]	Detailed conservation objectives for this European Site (Version 1, September 2019) were reviewed as part of the assessment and are available at www.npws.ie	The Subject Development is located entirely outside this European Site and ais separated from it by a distance of 12.1km. There is no potential for the Subject Development to result in or to have resulted in any direct effect on this European Site. **This European Site is located in a separate hydrological catchment. No complete source-pathway-receptor chain for the Subject Development to result or have resulted in Likely Significant Effects on this SAC was identified.**
Meenaguse/Ardbane Bog SAC [000172] **Distance:** 13.0km	Blanket bogs (* if active bog) [7130]	Detailed conservation objectives for this European Site (Version 1, May 2017) were reviewed as part of the assessment and are available at www.npws.ie	The Subject Development is located entirely outside this European Site and is separated from it by a distance of 13.0km. There is no potential for the Subject Development to result in or to have resulted in any direct effect on this European Site. **This European Site is located in a separate hydrological catchment. No complete source-pathway-receptor chain for the Subject Development to result or have resulted in Likely Significant Effects on this SAC was identified.**

Lough Nillan Bog (Carrickatlieve) SAC [000165] **Distance:** 14.2km	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] Blanket bogs (* if active bog) [7130]	Detailed conservation objectives for this European Site (Version 1, September 2016) were reviewed as part of the assessment and are available at www.npws.ie	The Subject Development is located entirely outside this European Site and is separated from it by a distance of 14.2km. There is no potential for the Subject Development to result in or to have resulted in any direct effect on this European Site. **This European Site is located in a separate hydrological catchment. No complete source-pathway-receptor chain for the Subject Development to result or have resulted in Likely Significant Effects on this SAC was identified.**
Donegal Bay (Murvagh) SAC **Distance:** 14.3km	Mudflats and sandflats not covered by seawater at low tide [1140] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] Humid dune slacks [2190] *Phoca vitulina* (Harbour Seal) [1365]	Detailed conservation objectives for this European Site (Version 1, July 2012) were reviewed as part of the assessment and are available at www.npws.ie	The Subject Development is located entirely outside this European Site and is separated from it by a distance of 14.3km. There is no potential for the Subject Development to have resulted in or to result in any direct effect on this European Site. This European Site is located in coastal and marine habitats that are significantly removed from the the Subject Development. The Subject Development is of a nature and scale such that it has no potential to have resulted or to result in any Likely Significant Effect on the SAC **No complete source-pathway-receptor chain for the Subject Development to result or have resulted in Likely Significant Effects on this SAC was identified.**
Special Protection Area (SPA)			

Lough Derg (Donegal) SPA [004057] **Distance:** 7.6km	Lesser Black-backed Gull (*Larus fuscus*) [A183] Herring Gull (*Larus argentatus*) [A184]	The generic Conservation Objectives for this European Site (Version 8, 23/03/2021) are: *To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA* *To maintain or restore the favourable conservation condition of the wetland habitat at Lough Derg (Shannon) SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.*	The Subject Development is located entirely outside this European Site and is separated from it by a distance of 7.6km. There is no potential for the Subject Development to have resulted in or to result in any direct effect on this European Site. The sites of the individual deviations which comprise the Subject Development do not provide any significant habitat for the SCI species as they are located in conifer plantation and immediately adjacent to the infrastructure of the Permitted Development. **No complete source-pathway-receptor chain for the Subject Development to result or have resulted in Likely Significant Effects on this SPA was identified.**
Pettigo Plateau Nature Reserve SPA [004099] **Distance:** 8.7km	Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	The generic Conservation Objective for this European Site (Version 8, 23/03/2021) is: *To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA*	The Subject Development is located entirely outside this European Site and is separated from it by a distance of 8.7km. There is no potential for the Subject Development to have resulted in or to result in any direct effect on this European Site. This European Site is located in a separate hydrological catchment. The Subject Development has no potential to have resulted in or to result in any significant impact on bird species. The sites of the individual deviations which comprise of the Subject Development do not provide any significant habitat for the SCI species as they are located in conifer plantation

			and immediately adjacent to the infrastructure of the Permitted Development **No complete source-pathway-receptor chain for the Subject Development to result or have resulted in Likely Significant Effects on this SPA was identified.**
Lough Nillan Bog SPA [004110] **Distance:** 14.2km	Merlin (*Falco columbarius*) [A098] Golden Plover (*Pluvialis apricaria*) [A140] Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] Dunlin (*Calidris alpina schinzii*) [A466]	The generic Conservation Objective for this European Site (Version 8, 23/03/2021) is: *To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA*	The Subject Development is located entirely outside this European Site and is separated from it by a distance of 14.2km. There is no potential for the Subject Development to have resulted in or to result in any direct effect on this European Site. This European Site is located in a separate hydrological catchment. The Subject Development has no potential to have resulted in or to result in any significant impact on bird species. No potential pathway for the Subject Development to result in or to have resulted in effects on this site was identified. The sites of the individual deviations which comprise the Subject Development do not provide any significant habitat for the SCI species as they are located in conifer plantation and immediately adjacent to the infrastructure of the Permitted Development. **No complete source-pathway-receptor chain for the Subject Development to result or have resulted in Likely Significant Effects on this SPA was identified.**

Donegal Bay SPA [004151] **Distance:** 14.3km	Great Northern Diver (*Gavia immer*) [A003] Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Common Scoter (*Melanitta nigra*) [A065] Sanderling (*Calidris alba*) [A144] Wetland and Waterbirds [A999]	Detailed conservation objectives for this site (Version 1, May 2012) were reviewed as part of the assessment and are available at www.npws.ie	The Subject Development is located entirely outside this European Site and is separated from it by a distance of 14.3km. There is no potential for the Subject Development to have resulted in or to result in any direct effect on this European Site. This European Site is located in coastal and marine habitats that are significantly removed from the Subject Development. The Subject Development is of a nature and scale such that it has no potential to have resulted or to result in any significant impact on bird species. The sites of the individual deviations which comprise the Subject Development do not provide any significant habitat for the SCI species as they are located in conifer plantation and immediately adjacent to the infrastructure of the permitted wind farm. **No complete source-pathway-receptor chain for the Subject Development to result or have resulted in Likely Significant Effects on this SPA was identified.**

5.1 Conclusion of Screening

It cannot be excluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European Sites, that the Subject Development, individually or in combination with other plans and projects, could result in or have resulted in likely significant effects on the following European Sites:

- River Finn SAC [002301]
- River Foyle and Tributaries SAC [UK0030320]
- Lough Eske and Ardnamona Wood SAC [000163]

The only complete source-pathway-receptor chain by which likely significant effects may occur is via the surface water connection between the Subject Development and the three identified SACs that are located downstream.

6. STAGE 2- IMPACT ASSESSMENT

6.1 Identification of relevant Qualifying Features and Desk Study

The potential for likely significant effects to occur or to have occurred on the three European Sites listed above, in the absence of any mitigation, individually or cumulatively with other plans or projects, was identified in the preceding section.

The following sections consider each European Site individually to:

1. Determine which individual qualifying features have the potential to be or have been adversely affected by the Subject Development.
2. Provide information with regard to the Conservation Objectives and site-specific pressures and threats for those qualifying features that have the potential to be adversely affected.

6.1.1 River Finn SAC

The potential for Likely Significant Effects on this SAC were identified in Section 5 above. The identified pathway for effect was via surface water connectivity between the the components of the Subject Development that are located in the Bunadaowen and Shruhangarve Catchments, which flow into the Mourne Beg, which is designated as part of the River Finn SAC.

Whilst none of the deviations which comprise of the Subject Development involve works within any natural watercourse, there are potential connections via forestry drains and overland flow. Thus, there is the potential for pollution in various forms to enter or have entered the watercourses and flow downstream to the SAC.

Table 6-1 below lists the qualifying features of this European Site and determines, in the light of its Conservation Objectives, whether there is any complete source-pathway-receptor chain, by which adverse effects may occur.

6.2 Identification of Individual Qualifying Features with the Potential to be Affected

Table 6-1 Assessment of Qualifying features potentially affected

Qualifying feature	Conservation Objective (NPWS, Version 1, May 2017[4]),	Rationale	Potential for Adverse Effects Y/N
Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]	To restore the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) in River Finn SAC	This habitat is found in lakes within the SAC. There is no Source-Pathway-Receptor chain between the Subject Development and any lakes within the SAC and therefore, no potential for it to result in or to have resulted in any adverse effect on this habitat	No
Northern Atlantic wet heaths with *Erica tetralix* [4010]	To restore the favourable conservation condition of Northern Atlantic wet heaths with *Erica tetralix* in River Finn SAC	No complete-source-pathway-receptor chain between the Subject Development and this terrestrial habitat was identified and therefore, there is no potential for it to result or have resulted in any adverse effect on this habitat	No
Blanket bogs (* if active bog) [7130]	To restore the favourable conservation condition of Blanket bogs (*if active bog) in River Finn SAC	No complete-source-pathway-receptor chain between the Subject Development and this terrestrial habitat was identified and therefore, there is no potential for it to result in or to have resulted in any adverse effect on this habitat	No
Transition mires and quaking bogs [7140]	To restore the favourable conservation condition of Transition mires and quaking bogs in River Finn SAC	No complete-source-pathway-receptor chain between the Subject Development and this habitat, which is strongly associated with the blanket bogs in the SAC was identified and therefore, there is no potential for it to result in or to have resulted in any adverse effect on this habitat	No

[4] *NPWS (2017) Conservation Objectives: River Finn SAC 002301. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.*

Salmo salar (Salmon) [1106]	To maintain the favourable conservation condition of Atlantic Salmon in River Finn SAC	A complete-source-pathway receptor chain for effects on salmon in the downstream aquatic environment was identified	Yes
Lutra lutra (Otter) [1355]	To maintain the favourable conservation condition of Otter in River Finn SAC	A complete-source-pathway receptor chain for effects on otter in the downstream aquatic environment was identified No potential for disturbance of the species was identified given the distances to the SAC and lack of suitable habitat for otter at the site of the deviations which comprise the Subject Development	Yes

6.2.1.1 Site Specific Pressures and Threats

As per the Natura 2000 Data Form, the site-specific threats, pressures and activities with potential to impact on the European Site were reviewed and considered in relation to the Subject Development. These are provided in Table 6-2.

Table 6-2 Site-specific threats, pressures and activities

Negative Impacts			
Rank	Threats and Pressures		Inside/Outside
High	A04.01	Invasive Grazing	Inside
High	B02.02	Forestry Clearance	Inside
High	C01.01	Sand and Gravel Extraction	Inside
High	C01.03.01	Hand Cutting of Peat	Inside
Low	E04	Structures, buildings in the landscape	Inside
Low	F05.04	Poaching	Inside
Medium	E03.01	Disposal of Household/Waste Facility	Inside
Medium	H01.05	diffuse pollution to surface waters due to agricultural and forestry activities	Inside
Medium	K01.01	Erosion	Inside

Potential pathways for effect with regard to site-specific threats, pressures and activities have been identified in relation to potential for erosion.

6.2.1.2 Species Specific Information

The Site-Specific Conservation Objective Document for the River Finn SAC was consulted and the species-specific information on each of the relevant species (Salmon and Otter) was reviewed including the individual Conservation Objectives for each species together with the targets and attributes by which they are defined. The site specific conservation objective document is available at the following link.

6.2.2 River Foyle and Tributaries SAC [UK0030320]

The potential for Likely Significant Effects on this SAC were identified in Section 5 above. The identified pathway for effect was via surface water connectivity between the Study Area and the components of the Subject Development that are located in the Glendergan River Catchment, which is designated as part of the River Finn SAC.

Whilst none of the deviations which comprise the Subject Development involve works within any natural watercourse, there are potential connections via forestry drains and overland flow. Thus, there is the potential for pollution in various forms to enter the watercourses and flow downstream to the SAC

Table 6-3 below lists the qualifying features of this European Site and determines, in the light of their Conservation Objectives, whether there is any complete source-pathway-receptor chain, by which adverse effects may occur.

6.2.2.1 Identification of Individual Qualifying Features with the Potential to be Affected

Table 6-3 Assessment of Qualifying features potentially affected

Qualifying feature	Qualifying Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie and NIEA online information, www.deara-ni.gov.ie on the 20/10/2023	Rationale	Potential for Adverse Effects Y/N
Salmo salar (Salmon) [1106]	Maintain and if possible expand existing population numbers and distribution (preferably through natural recruitment), and improve age structure of population Maintain and if possible enhance the extent and quality of suitable Salmon habitat - particularly the chemical and biological quality of the water	A complete-source-pathway receptor chain for effects on salmon in the downstream aquatic environment was identified	Yes

	and the condition of the river channel and substrate		
Lutra lutra (Otter) [1355]	Maintain and if possible increase population numbers and distribution. Maintain the extent and quality of suitable Otter habitat, in particular the chemical and biological quality of the water and all associated wetland habitats	A complete-source-pathway receptor chain for effects on otter in the downstream aquatic environment was identified No potential for disturbance of the species was identified given the distances to the SAC and lack of suitable habitat for otter at the site of the deviations which comprise the Subject Development	Yes
Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callicricho-Batrachion* vegetation	Maintain and if possible enhance extent and composition of community. Improve water quality Improve channel substrate quality by reducing siltation. Maintain and if feasible enhance the river morphology	A complete-source-pathway receptor chain for effects on this habitat in the downstream aquatic environment was identified	Yes

6.2.2.2 Site Specific Pressures and Threats

As per the Conservation Objectives Document, the main pressures and threats on the SAC are as follows:

- Water Quality/Eutrophication
- Channel and Bank Modification
- Substrate Siltation
- Sand Extraction
- Fish Farms
- Water Extraction
- Fly Tipping
- Alien Species
- Nitrogen Deposition
- Changes to surrounding Land Use
- Climate Change

Potential pathways for effect with regard to site-specific threats, pressures and activities have been identified in relation to potential for water quality and substrate siltation.

6.2.2.3 Species Specific Information

The Site Specific Conservation Objective Document for the River Foyle and Tributaries SAC was consulted and the species specific information on each of the relevant species and habitats (*Ranunculion fluitantis* and *Callicricho-Batrachion,* Salmon and Otter) was reviewed including the individual Conservation Objectives for each species together with the targets and attributes by which they are defined. The site specific conservation objective document is available at the following link.

6.3 Lough Eske and Ardnamona Wood SAC [000163]

The potential for Likely Significant Effects on this SAC were identified in Section 5 above. The identified pathway for effect was via surface water connectivity between the Study Area and the deviation that is located in the Lowerymore Catchment (deviation 1), the downstream sections of which are designated as part of the Lough Eske and Ardnamona Wood SAC [000163].

Whilst none of the deviations involve works within any natural watercourse, there are potential connections via forestry drains and overland flow. Thus, there is the potential for pollution in various forms to enter or have entered the watercourses and flow downstream to the SAC.

Table 6-4 below lists the qualifying features of this European Site and determines, in the light of their Conservation Objectives, whether there is any complete source-pathway-receptor chain, by which adverse effects may occur.

6.3.1.1 Identification of Individual Qualifying Features with the Potential to be Affected.

Table 6-4 Assessment of Qualifying features potentially affected

Qualifying feature	Conservation Objective (NPWS, Version 1, September 2019[5]),	Rationale	Potential for Adverse Effects Y/N
Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]	To restore the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) in Lough Eske and Ardnamona Wood SAC	A complete-source-pathway receptor chain for effects on this habitat in the downstream aquatic environment was identified	Yes
Petrifying springs with tufa formation (*Cratoneurion*) [7220]	To maintain the favourable conservation condition of Petrifying springs with tufa formation (*Cratoneurion*)* in Lough Eske and Ardnamona Wood SAC	No complete-source-pathway-receptor chain between the Subject Development and this habitat that is not associated with surface water downstream of the Subject Development was identified and therefore, there is no potential for it to result or have resulted in any adverse effect on this habitat	No
Old sessile oak woods with Ilex and Blechnum in the British Isles	To maintain the favourable conservation condition of Old sessile oak woods with Ilex and Blechnum in the British Isles in Lough Eske and Ardnamona Wood SAC	No complete-source-pathway-receptor chain between the Subject Development and this terrestrial habitat was identified and therefore, there is no potential for it to result or have resulted in any adverse effect on this habitat	No

[5] *NPWS (2019) Conservation Objectives: Lough Eske and Ardnamona Wood SAC 000163. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.*

Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]	To restore the favourable conservation condition of Freshwater Pearl Mussel (*Margaritifera margaritifera*) in Lough Eske and Ardnamona Wood SAC	A complete-source-pathway receptor chain for effects on salmon in the downstream aquatic environment was identified	No
Salmo salar (Salmon) [1106]	To restore the favourable conservation condition of Atlantic Salmon (*Salmo salar*) in Lough Eske and Ardnamona Wood SAC	A complete-source-pathway receptor chain for effects on salmon in the downstream aquatic environment was identified	Yes
Trichomanes speciosum (Killarney Fern) [1421]	To maintain the favourable conservation condition of Killarney Fern (*Vandenboschia speciosa*) in Lough Eske and Ardnamona Wood SAC	No complete-source-pathway-receptor chain between the Subject Development and this terrestrial species was identified and therefore, there is no potential for it to result or have resulted in any adverse effect on this habitat	No

6.3.1.2 Site Specific Pressures and Threats

As per the Natura 2000 Data Form, the site-specific threats, pressures and activities with potential to impact on the European Site were reviewed and considered in relation to the Subject Development. These are provided in Table 6-5.

Table 6-5 Site-specific threats, pressures and activities

Negative Impacts			
Rank	Threats and Pressures		Inside/Outside
High	F03.02.09	Other forms of taking animals	Inside
High	H01.05	Diffuse pollution to surface waters due to agricultural and forestry activities	Inside
High	I01	Invasive non natives	Inside
Low	E01.03	Dispersed habitation	Inside
Medium	J02	Human induced changes in hydraulic conditions	Inside

No potential pathways for effect with regard to site-specific threats, pressures and activities have been identified in relation to the Subject Development.

6.3.1.3 Species Specific Information

The Site-Specific Conservation Objective Document for the Lough Eske and Ardnamona Wood SAC was consulted and the species-specific information on each of the relevant species (Oligotrophic lakes, Salmon and Freshwater pearl mussel) was reviewed including the individual Conservation Objectives for each species together with the targets and attributes by which they are defined. The site specific conservation objective document is available at the following link.

7. ASSESSMENT OF POTENTIAL EFFECTS & ASSOCIATED MITIGATION

This section of the rNIS assesses the potential effects of the Subject Development on the identified relevant Qualifying Interests. This assessment is undertaken in the absence of any mitigation and in respect of the conservation objectives of the European Sites. The Conservation Objectives each of the European Sites assessed were reviewed on the 19/11/2023

Following the initial impact assessment, mitigation is prescribed where necessary to avoid adverse effects on the Conservation Objectives of the relevant QIs/SCIs.

7.1 Potential for Direct Effects on the European Sites

There is no potential for direct effects to occur or have occurred as the Site and the Subject Development components are located entirely outside of any European Site.

7.2 Potential for Indirect Effects on the European Sites

7.2.1 Impacts on Surface Water

As identified in the preceding sections, only one complete source-pathway-receptor chain for adverse effect on any European Site was identified. This was the potential for the Subject Development to have resulted, or to result in effects on water quality.

The potential for the works to result in, or have resulted in indirect effects on aquatic habitats (and associated species) as a result of water pollution was therefore assessed. This could have been in the form of run off of silt laden or polluted water from the construction site, run off of hydrocarbons and other pollutants, erosion of completed infrastructure or the faster run off of water from hard standing areas.

Following the precautionary principle, there is potential for the works, if undertaken without mitigation, to have resulted in an adverse effect on the aquatic QIs of the Lough Eske and Ardnamona Wood SAC, River Finn SAC and The River Foyle and Tributaries SAC.

Given the nature, scale and location of the works, it is unlikely that even in a worst case scenario, in the absence of any mitigation, they could result or have resulted in anything more a short term, negligible, negative effect on aquatic receptors within the SACs during either construction or operation.

No evidence of any such effects having occurred was identified during the ecological surveys or in the water quality data recorded in any of the rivers that are within the SACs and no potential for adverse effects to occur was identified. As evidenced in the results of the water quality monitoring that is presented in the preceding sections, no deterioration of water quality has been recorded in any of the SACs that are located downstream of the Subject Development components (with the exception of a short term, negative effect on water quality in the Mourne Beg River downstream of the Shruhangarve as a result of the peatslide in 2020, results since then have shown a recovering trend in water quality such that the Mourne Beg River now exceeds pre-construction baseline water quality).

It should be noted that all works that were associated with the Subject Development were undertaken following methodologies and adhering to mitigation that was set out in the Submitted EIAR. The only exception to this was where a pond was relocated and expanded in Deviation 1.

7.2.2 Best Practice and Mitigation Employed

7.2.2.1 Construction Methodologies

Construction of the Subject Development followed the same construction methodologies as the Permitted Development, the only difference being slight changes to the location of discreet pieces of infrastructure. The construction methodologies followed for the Subject Development are discussed in detail in the following sections.

Site Roads and Hardstand Areas

During the initial construction of the Permitted Development, existing forestry tracks were upgraded where possible and new access roads were constructed to provide access within the Site and to connect the wind turbines and associated infrastructure. Crane hardstands were constructed at the base of each of the turbine locations. The parts of the Subject Development that relate to site roads, hardstands, and laybys were constructed using the same methodology as that used for the Permitted Development. The construction methodology for site roads and hardstands at the Meenbog Windfarm is summarised below.

Site roads were constructed to each turbine base and at each base a crane hard standing was constructed to the turbine manufacturer's specifications. Once tree felling was completed, tracked excavators carried out excavation for roads with appropriate equipment attached. The excavations followed a logical route working away from the borrow pit locations. Excavated material was transported back to the borrow pits in haul trucks. Material excavated to create the working area was stored locally for later reuse in backfilling the working area around the turbine foundation. The excavated material was covered with polythene sheets and surrounded by silt fences to ensure sediment-laden run-off did not occur.

When the formation layer was reached, stone from the on-site borrow pit was placed to form the road foundation. The sub grade was compacted with the use of a roller. The final wearing course will not be provided until all bases have been poured. This prevents damage to the wearing course due to stone and concrete trucks movements. The road will be upgraded prior to the arrival of the first turbine. All roads will be maintained for the duration of the operation of the Meenbog Windfarm. Site roads and hardstand areas were constructed in accordance with the CEMP for the Meenbog Windfarm (Appendix 3-2)

The construction of deviation 1 included the alteration of an existing quarry water retention pond to the north of the realigned road. The excavation and alteration of the quarry pond followed the following methodology;

- The works were completed under favourable, dry weather conditions to avoid water flowing into and out of the pond during the operation.
- The pond was pumped dry with the pumped water being discharged to ground in the quarry void that was located to the southeast. The pumped water was not discharged to any watercourse and dissipated to ground.
- The peat was replaced by competent rock for stability of the road with the rock gained from the area immediately adjacent to the works.
- Material was excavated from the north to expand the footprint of the pond and restore the original pond dimensions,

- The peat material was removed via dump trucks to a peat repository on the site of the Permitted Development and the banks of the new pond were shaped using an excavator from the pond base.
- The seal at the bottom of the old pond, which had built up over many years of sediment deposits was recreated using a plastic liner.
- Finally, the original concrete overflow pipes were extended into the altered pond to reconnect the pond to the quarry drainage network.
- A 2m chain-link fence was installed around the pond for safety.

Borrow Pits

The following methodology applied to the construction of borrow pits comprised within the Subject Development:

- The areas to be used were marked out at the corners using ranging rods or timber posts. Drainage runs and associated stilling ponds were installed around the perimeter;
- Tree felling occurred, where necessary,
- The initial borrow pit excavation involved the removal of peat and overburden from the top of bedrock. These materials were used to form a berm on the downhill side of the borrow pit to provide screening of the borrow pit operations;
- Interceptor drainage ditches were excavated on all sides of the borrow pit to catch surface water runoff, and direct it to downstream re-distribution locations;
- The bedrock material was extracted from the borrow pit and stockpiled or used as required;
- The use of material won from the borrow pit was sequential with new road construction or turbine base formations;
- Temporary stockpiling of aggregates was required to accommodate the cut and fill operations within the borrow pit, and the progression of access roads and turbine excavations;
- As the borrow pit excavations progressed, surface water and groundwater ingress was removed via pumping to settlement ponds, and re-distribution locally across natural vegetated areas. Where required additional specialist treatment, including sediment bags and silt fences, was employed to ensure no deterioration in downstream water quality occurred;
- When extraction ceased within the borrow pit, the uphill face of the rock was stepped and deposits of soil were placed which assisted in the revegetation of the rock face.
- Following the cessation of rock extraction the borrow pits were back filled with peat removed from the permanent development footprint areas i.e. excavated roads, hard standing areas and turbine foundation areas; and
- Once the deposition of peat has been concluded the borrow pits will be permanently secured and a stock-proof fence to prevent access. Appropriate health and safety signage will also be installed.

7.2.2.1.2 *Peat and Spoil Management Plan*

Peat Storage Cells

While peat storage cells were not initially anticipated for the Permitted Development and therefore not included in the CEMP a methodology was developed for their construction and is described below. The peat storage cells were constructed in accordance with the environmental management measures set out in the CEMP (Appendix 3-2) Peat storage cells comprised with the Subject Development were constructed using the following methodology:

- The areas to be used were marked out at the corners using ranging rods or timber posts.
- Tree felling occurred, where necessary,
- Ground was prepared in the area to be occupied by the peat cell and, where necessary, material was removed in order to create the required void space.
- Soil/peat were stripped in order to construct the rock berm.
- Rock from the on-site borrow pit was deposited and then placed using excavator.
- The berm was constructed in a manner which prevented water retention within the storage area. This was in order to prevent a build-up of hydrostatic pressure at the base of the berm at a varying rate across the footprint which could have effectively placed a point load at a specific location.
- Large rocks were placed with an 'open bond' periodically to allow water to pass through the berm in a controlled manner.
- The berm was inspected and signed off by competent personnel.

The following methodology was utilized for the deposition of peat within the peat cells:

- Excavators removed the peat from the development footprint areas i.e. excavated roads, hard standing areas and turbine foundation areas.
- Temporary, sealed stockpiling areas, located adjacent to the hard standing areas and turbine foundation areas, were chosen following onsite discussions between the construction site manager, an ecologist, a geotechnical engineer and hydrologist.
- The excavators moved the excavated peat to the designated temporary stockpiling areas within the construction and soft levelled areas.
- The temporary stockpiling areas were surrounded by silt fences to ensure sediment-laden run-off did not occur.
- The excavated peat remained in these areas over a period of time until the volume of the peat has reduced as the water drains out of the mounded peat.
- The excavators then loaded the peat directly into dump trucks, to transport the peat to the nearest peat cell.
- The material was backfilled into the peat cells and spread evenly across the area.
- Once the deposition of peat has been concluded the peat cells will be permanently secured and a stock-proof fence to prevent access. Appropriate health and safety signage will also be installed.

Peat Containment Berm

The CEMP for the Meenbog Windfarm outlines emergency response procedures to be followed in the event a peat slide occurred at the site (Section 5.1.5). The berm was constructed after a minor peat slide and followed emergency response procedure for peat slide events as follows:

- On alert of a peat slide incident, all construction activities ceased, and all available resources were diverted to assist in the required mitigation procedures.
- Action was taken to prevent a peat slide reaching any watercourse. This took the form of the construction of a check barrage or berm on land.
- The localised peat slide did not represent an immediate risk to a watercourse and had essentially come to rest, the area was stabilised initially by rock infill, The failed area and surrounding area were then assessed by the engineering staff and stabilisation procedures implemented. The area was monitored until movements had ceased.

The berm was constructed as follows:

- Soil/peat were stripped in order to construct the rock berm. This peat was moved to the leeward side of the rock berm and spread to a depth of <500mm using a low ground pressure excavator.
- Articulated dump trucks drew rock from a borrow pit, this was deposited and then placed using excavator.
- Plant operators did not expose excessive amounts of the works area in front of the backfill material.
- The berm was constructed at a minimum of 6m in width at the beginning. It was widened further as construction continued so as to allow articulated dumpers and excavators to easily travel along the top.
- The berm was constructed in a manner which prevented water retention within the storage area. This was in order to prevent a build-up of hydrostatic pressure at the base of the berm at a varying rate across the footprint which could have effectively placed a point load at a specific location.
- Large rocks were placed with an 'open bond' periodically to allow water to pass through the berm in a controlled manner.
- The berm was inspected and signed off by competent personnel.

7.2.2.1.3 *Water Quality Mitigation Measures*

Water quality mitigation measures were installed on in accordance with the Drainage Management Plan set out in Section 4 of the CEMP for the Meenbog Windfarm (Appendix 3-2). Water quality mitigation measures in the vicinity of the Subject Development were developed in accordance with the Reactive Site Drainage and Management provisions set out in Section 3.2.4.3 of the CEMP and were designed to ensure the protection of watercourses on the site. As-Built drainage drawings for the entire Meenbog Windfarm Site are included as Appendix 3-3

Roadside Berms

A tracked excavator was used to create a low berm along the edges of the wind farm spine in key locations. The berms were constructed on the advice of the project hydrologist to a height of approximately 1m, bucket sealed, and allowed to revegetate naturally.

Stilling Ponds

A tracked excavator was used to excavate stilling ponds so that the length to width ratio was greater than 2:1, where the length is the distance between the inlet and the outlet. Stilling ponds were constructed in a wedge shape, with the inlet located at the narrow end of the wedge. Each stilling pond was a minimum of 1-1.5 metres in depth. The embankment that forms the sloped sides of the stilling were stabilised with vegetated turves. Stilling ponds were inspected weekly and following rainfall events. Inlet and outlets were checked for sediment accumulation and anything else that might interfere with flows. Sediment was cleaned out as necessary.

7.2.2.1.4 *Mitigation*

Mitigation and best practice that was set out in the Submitted EIAR was followed in respect of the Subject Development. The mitigation in respect of the protection of surface waters is set out in 6 and 9 of the Submitted EIAR. All the mitigation measures were set out in the CEMP that was submitted as an appendix to that EIAR. The relevant mitigation that was adhered to is provided below.

Good Environmental Management During Construction

Timing of road works can strongly influence the potential for damaging the freshwater environment. Operations during wetter periods of the year pose a significantly greater risk of

causing erosion and siltation, which can be particularly severe following major rainfall or snowmelt events. Traditionally, wind farm construction undertaken during the drier summer months would result in significantly less erosion and siltation. Construction activities in the hydrological buffer zones shall be avoided during or after prolonged rainfall or an intense rainfall event and work will cease entirely near watercourses when it is evident that water quality is being impacted. Given that this site has an established road network and existing watercourse crossing points, there will be minimal impacts on watercourses.

Site Drainage Principles

The site drainage features for this site have previously been outlined in Section 4.7 of the EIAR and are again further developed in Section 4 of this CEMP. The protection of the watercourses within and surrounding the site, and downstream catchments that they feed is of utmost importance in considering the most appropriate drainage proposals for the site of the proposed development. No routes of any natural drainage features will be altered as part of the proposed development as new watercourse crossings are kept to a minimum to facilitate the proposed development. Turbine locations and associated roadways were originally selected to avoid natural watercourses and existing roads are to be used wherever possible. The proposed development has where possible, been kept a minimum of 50 metres from natural watercourses. There will be no direct discharges to any natural watercourses, with all drainage waters being dispersed as overland flows. Buffer zones around the existing natural drainage features have informed the layout of the proposed development.

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

Legislation and Best Practice Guidance

The drainage design has been prepared based on experience of the project team of other wind farm sites in peat-dominated environments, and the number of best practice guidance documents.

There is no one guidance document that deals with drainage management and water quality controls for wind farm developments. However, a selection of good practice approaches have been adopted in preparation of this CEMP, and these are taken from the various best practice guidance documents listed below. These relate to infrastructure and operational works on forested sites, forest road design, water quality controls for linear projects, forestry road drainage and management of geotechnical risks. To achieve best practice in terms of water protection through construction management all drainage management is prepared in accordance with guidance contained in the following:

- *Forestry Commission (2004): Forests and Water Guidelines, Fourth Edition. Publ. Forestry Commission, Edinburgh;*
- *Coillte (2009): Forest Operations & Water Protection Guidelines;*
- *Forest Service (Draft): Forestry and Freshwater Pearl Mussel Requirements – Site Assessment and Mitigation Measures;*
- *Forest Service (2000): Forestry and Water Quality Guidelines. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford;*
- *Forest Service, (2000): Code of Best Forest Practice – Ireland. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford;*
- *COFORD (2004): Forest Road Manual – Guidelines for the design, construction and management of forest roads;*

- *MacCulloch (2006): Guidelines for risk management of peat slips on the construction of low volume low cost roads over peat (Frank MacCulloch Forestry Civil Engineering Forestry Commission, Scotland);*
- *Authority (2005): Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;*
- *Wind Farm Development Guidelines for Planning Authorities (September 1996);*
- *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites. Eastern Regional Fisheries Board;*
- *Guidelines on Protection of Fisheries During Construction Works Adjacent to Waters, Inland Fisheries Ireland (2016):;*
- *Good Practice During Wind Farm Construction (Scottish Natural Heritage, 2010);*
- *PPG1 - General Guide to Prevention of Pollution (UK Guidance Note);*
- *PPG5 – Works or Maintenance in or Near Water Courses (UK Guidance Note);*
- *CIRIA (Construction Industry Research and Information Association) guidance on 'Control of Water Pollution from Linear Construction Projects' (CIRIA Report No. C648, 2006);*
- *Control of water pollution from construction sites - Guidance for consultants and contractors. CIRIA C532. London, 2001; and,*
- *Control of water pollution from linear construction projects -Technical guidance. CIRIA C648 London, 2006.*

Site Drainage Design and Management

The proposed site drainage features for this site are outlined in Section 4.7 of the EIAR. As this CEMP is a working document and is presented as an Appendix to the EIAR, the detailed drainage measures are not included in this document. When the final CEMP report is prepared and presented as a standalone document, all drainage measures will be included in that document. The drainage proposals will be developed further prior to the commencement of construction. The following sections give an outline of drainage management arrangements in terms of pre-construction, construction and operational phases of the Proposed Development.

Pre-Construction Drainage

There is an existing drainage network across the site, and due to the sloping nature of the area, runoff drains relatively freely to local watercourses and streams. This existing drainage system will continue to function as it is during the pre-construction phase.

However, prior to commencement of works in sub-catchments across the site main drain inspections will be competed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on a catchment by catchment basis as the construction works develop across the site, as works in all areas will not commence simultaneously.

Construction Phase Drainage

The Project Hydrologist/Design Engineer will complete a site drainage plan before construction commences and will attend the site to set out and assist with micro siting of proposed drainage controls as outlined in Section 4.7 of the EIAR. The drainage system will be excavated and constructed in conjunction with the road and hard standing construction. Drains will be excavated and stilling ponds constructed to eliminate any suspended solids within surface water running off the site.

Best practice and practical experience on other similar projects suggests that in addition to the drainage plans that are included in the EIAR, there are additional site based decisions and plans that can only be made in the field through interaction between the Site Construction

Manager, the Project Hydrologist and the Project Geotechnical Engineers. The mechanisms for interaction between these are outlined within Section 4 of this CEMP.

In relation to decisions that are made on site it is important to stress that these will be implemented in line with the associated drainage controls and mitigation measures outlined in Section 6 below, and to ensure protection of all watercourses.

Operational Phase Drainage

The project hydrologist will inspect and review the drainage system after construction has been completed to provide guidance on the requirements of an operational phase drainage system. This operational phase drainage system will have been installed during the construction phase in conjunction with the road and hardstanding construction work as described below:

- *Interceptor drains will be maintained up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader.*
- *Swales/road side drains will be maintained to intercept and collect runoff from access roads and hardstanding areas of the site, likely to have entrained suspended sediment, and channel it to stilling ponds for sediment settling;*
- *Check dams will be maintained at regular intervals along interceptor drains and swales/roadside drains in order to reduce flow velocities and therefore minimise erosion within the system during storm rainfall events; and,*
- *Stilling ponds/settlement ponds, emplaced downstream of swales and roadside drains, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses. The stilling ponds will be sized according to the size of the area they will be receiving water from, but will be sufficiently large to accommodate peak flows storm events. Inspection and maintenance of all settlement ponds will be ongoing through the construction period.*

Preparative Site Drainage Management

All materials and equipment necessary to implement the drainage measures outlined above will be brought on-site in advance of any works commencing.

An adequate quantity of straw bales, clean stone, terram, stakes, etc. will be kept on site at all times to implement the drainage design measures as necessary. The drainage measures outlined in the above will be installed prior to, or at the same time as the works they are intended to drain.

Pre-emptive Site Drainage Management

The works programme for the groundworks part of the construction phase of the project will also take account of weather forecasts, and predicted rainfall. Large excavations and movements of overburden or large-scale overburden or soil stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.

Reactive Site Drainage Management

The final drainage design prepared for the site has provided for reactive management of drainage measures. The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously by the Environmental Clerk of Works (ECoW) on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. This may require the installation of additional check dams, interceptor drains or swales as deemed necessary on-site. The drainage design may have to be modified on the ground as necessary, and the modifications will draw on the various features outlined above in whatever combinations are deemed to be most appropriate to situation on the ground at a particular time.

In the event that works are giving rise to siltation of watercourses, the ECoW or supervising hydrologist will stop all works in the immediate area around where the siltation is evident. The source of the siltation will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing.

8. ASSESSMENT OF RESIDUAL ADVERSE EFFECTS

The potential for residual adverse effects on each of the individual relevant Qualifying Features of the Screened In European Sites following the implementation of mitigation, is assessed in this section of the report.

No evidence of any such effects having occurred was identified during the ecological surveys or in the water quality data recorded in any of the rivers that are within the SACs. As evidenced in the results of the water quality monitoring that is presented in the preceding sections, no deterioration of water quality has been recorded in any of the SACs that are located downstream of the Subject Development (with the exception of a negative effect on water quality in the Mourne Beg River downstream of the Shruhangarve as a result of the peatslide in 2020, results since then have shown a recovering trend in water quality such that the Mourne Beg River now exceeds pre-construction baseline water quality).

Based on the preceding sections and the lack of any identified deterioration in water quality in the receiving catchments, in view of best scientific knowledge, on the basis of objective information, there is no potential for adverse effect on the identified QIs/SCIs and their associated targets and attributes, or on any European Site to occur or have occurred. Potential pathways for effect have been robustly blocked through measures to avoid impacts and the incorporation of best practice/mitigation measures into the project design.

Taking cognisance of measures to avoid impacts and best practice/mitigation measures incorporated into the project design which are considered in the preceding section, the Subject Development has not and will not have an adverse effect on the integrity of any European Site.

The Subject Development has not and will not prevent the QIs/SCIs of European Sites from achieving/maintaining favourable conservation status in the future as defined in Article 1 of the EU Habitats Directive. A definition of Favourable Conservation Status is provided below:

> *'conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2; The conservation status will be taken as 'favourable' when:*
>
> - Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
> - The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
> - There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.'

Based on the above, it can be concluded in view of best scientific knowledge, on the basis of objective information that the Subject Development has not and will not adversely affect the Qualifying Interests/Special Conservation Interests associated with any European Site.

9. ASSESSMENT OF CUMULATIVE EFFECTS

Following the assessment that is presented in the preceding sections of this rNIS, no evidence was recorded to show that the Subject Development has resulted or could result in any adverse effect on any European Site when considered on its own.

The components of the Subject Development represent deviations to the permitted development. The deviations are located within or immediately adjacent to the study area for the Permitted Development and are commensurate with those previously assessed as part of the Permitted Development. The Subject Development did not give rise to the need for any mitigation or best practice measures to be applied to avoid or reduce impacts on European Sites other than those that were already prescribed as part of the Permitted Development in the Submitted EIAR and CEMP.. Each individual deviation comprised in the Subject Development has been individually assessed with details of the pre and post development habitats and construction methodologies considered.

The Subject Development has been considered cumulatively and in combination with other plans and projects including the Permitted Development (both as built and yet to be constructed) and a peat slide that occurred in November 2020 together with the emergency works associated with it and all subsequent remediation works (Phases 1A, 1B & 2) of the Meenbog Windfarm – Peat Slide Action Plan carried out under the supervision of Donegal County Council). In addition, the Subject Development has been considered cumulatively and in-combination with other land uses in the area as detailed below.

9.1 Cumulative Effects when considered in combination with the Permitted Meenbog Windfarm (ABP Ref: PA05E.300460)

The potential for drainage effects on Croaghonagh Bog SAC as a result of the Permitted Development was identified as a potential effect in the Submitted NIS. Mitigation as set out in the submitted NIS and EIAR to prevent any such effect was identified and employed (and will be employed in any further works that may be necessary to complete the construction of the permitted development). The potential for any of the components of the Subject Development to result in any cumulative effects was considered. Only Deviation One was located in proximity to this SAC. The potential for any such effect was considered and it was concluded that as Deviation One is downgradient from the SAC and is separated from it by the permitted road. As such, there is no potential for the deviation to have had any impact in respect of drainage of the SAC and there is no source pathway receptor chain for the deviation to result or to have resulted in any effect on the SAC. No complete source, pathway, receptor chain was identified between the other components of the Subject Development and this SAC and no potential for them to result in any individual or cumulative effect on the SAC was identified.

The potential for disturbance to otter associated with the River Foyle and Tributaries SAC as a result of the Permitted Development was identified in the submitted EIAR and NIS on a precautionary basis and mitigation was identified and employed to avoid any such effect. None of the components of the Subject Development were located in close proximity to habitat for otter and as such, no complete source pathway receptor chain was identified. No potential for any cumulative effect was identified.

In addition, the potential for emissions to surface water were identified as a potential indirect effect on the Qualifying Interests of River Finn SAC, Lough Eske and Ardnamona Wood SAC and River Foyle and Tributaries SAC in the Submitted NIS. Mitigation was set out in the Submitted EIAR and associated appendices to prevent any effect on any European Site as a result of the Permitted Development. A

similar pathway for effect was identified in respect of the Subject Development and similar (the same) mitigation was employed during its construction and operation. Similarly, no evidence of any effect on any European Site was identified. The same mitigation will be employed in any further works that may be necessary to complete the construction of the permitted development. No potential for cumulative effect was identified.

The Submitted NIS concluded as follows:

> *It can be excluded, on the basis of objective scientific information, that the Proposed Development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site.*

No mechanism for the Subject Development to have resulted or to result in cumulative effects when considered in combination with the Permitted Development was identified.

9.2 Cumulative Effects When Considered in Combination with Peat Movements on the Site including the November 2020 Peat Slide and all subsequent remediation Works

The Subject Development was considered cumulatively with peat movements on the site including a peat slide that occurred in November 2020 and subsequent consequential remediation works. With respect to the peatslide event, there was a significant effect and noted deterioration in water quality within the Mourne Beg River, which is designated as part of the River Finn SAC, immediately following the event. However, results since then (as presented in Section 4 of this rNIS) have shown a recovering trend in water quality such that the Mourne Beg River now exceeds pre-construction baseline water quality. Relevant information pertaining to the peat slide and subsequent remediation and monitoring undertaken is provided in Appendix 9.1.

Following, the peatslide event, emergency stabilisation and remediation works were undertaken on the site of the Permitted Development and on the Shruhangarve River, which is a tributary of the Mourne Beg that was in the path of the peat slide and is also recovering. These works were the subject of an ecological assessment and Screening for Appropriate Assessment. These documents were reviewed and taken into account as part of this cumulative assessment.

No evidence of the Subject Development having led to any adverse effects on the Mourne Beg River either before or after the peat slide was identified during any of the surveys and assessments undertaken. Following the implementation of mitigation as set out in the Submitted EIAR and implemented as part of the Subject Development, there is no complete source pathway receptor chain between the Subject Development and the Mourne Beg River and River Finn SAC. There is therefore, no potential for any cumulative effects in this regard.

9.3 Surrounding Land Uses

The land surrounding the Subject Development is dominated by conifer forestry with upland grasslands that are grazed with sheep and cattle. There are quarrying and peat harvesting activities ongoing in the wider area. The potential for the Subject Development to contribute to cumulative effects on European Sites when considered alongside these land uses was assessed.

However, the deviations which comprise of the Subject Development were all located within conifer plantation, wind farm access roads and related habitats that are not ecologically sensitive and have not resulted in and will not result in any significant habitat loss and none were within or adjacent to any EPA named watercourse or European Site.

Similarly, no evidence of the Subject Development having led, or having the potential to lead to any adverse effects on the Mourne Beg River (River Finn SAC), the Lowerymore River (Lough Eske and Ardnamona Woods SAC) or the Glendergan River (River Foyle and Tributaries SAC) was identified during any of the surveys and assessments undertaken. Following the implementation of mitigation as set out in the Submitted EIAR , there is no complete source pathway receptor chain for effect between the Subject Development and the relevant SACs. There is therefore, no potential for any cumulative effects in this regard.

9.4 Other Plans and Projects

Following the implementation of the mitigation that was set out in the Submitted EIAR, no pathway for the Subject Development to impact or to have impacted on European Sites was identified. However, following the precautionary principle, the planning registers for both Donegal and Tyrone County Councils were consulted on the 28th March 2024 with regard to recently permitted or constructed developments within the area. Projects considered included those that are located within and around the site of the Permitted Development and the Subject Development, along with those within the Mourne Beg, Lowerymore and Glendergan catchments.

Relevant plans including the Donegal County Development Plan 2018 - 2024 and the Strabane Area Plan 1986 – 2001 (still current), 4th National Biodiversity Action Plan 2023-2030, The Regional Planning Guidelines for the West 2010-2022 were also considered and the subject development was found to be consistent with the policies and objectives of these plans with no potential for cumulative effects identified. Details of these assessments are provided in Appendix 9.2.

9.5 Conclusion of Cumulative Assessment

The assessment takes into account all associated potential effects on European Sites as a result of the Subject Development cumulatively and in combination with all other relevant plans and projects (including the peat slide and the permitted Wind Farm (as built and future completion). No potential for the Subject Development to have resulted or to result in any adverse effects on any European Site was identified when considered individually. The deviations are entirely contiguous with the Permitted Development and are commensurate with works that have already been assessed in the Submitted EIAR and the Submitted NIS. They do not require any additional mitigation or best practice and are of a nature and scale such that there is no potential for them to contribute or have contributed to any cumulative effect when considered in combination with any other plan, project, event or activity. No additional pathways for effect on any European Sites were identified when the Subject Development was considered in combination with any other plans, projects, events, land uses or works.

10. CONCLUDING STATEMENT

This rNIS has provided an assessment of all potential direct or indirect adverse effects on European Sites.

Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur or have occurred has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction and operation of the Subject Development does not adversely affect the integrity of European sites.

Therefore, it can be objectively concluded that the Subject Development, individually or in combination with other plans or projects, have not and will not adversely affect the integrity of any European Site.

BIBLIOGRAPHY

Bailey, M. and Rochford J. (2006) Otter Survey of Ireland 2004/2005. Irish Wildlife Manuals, No. 23. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Balmer, D.E., Gillings, S., Caffrey, B.J., Swann, R.L., Downie, I.S. and Fuller, R.J. (2013). Bird Atlas 2007-11: the breeding and wintering birds of Britain and Ireland. BTO Books, Thetford, UK.

Barbour, M.T. and J.B. Stribling. (1991) Use of Habitat Assessment in Evaluating the Biological Integrity of Stream Communities. Biological Criteria: Research and Regulation: 25-38. EPA-440/5-91-005. Washington, DC: Office of Water, US EPA.

Birds Directive (2009/47/EC) – http://ec.europa.eu/environment/nature /legislation/birds directive /index _en.htm

CIEEM, 2018, Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine.

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) and Directive 2009/147/EC (codified version of Directive 79/409/EEC as amended) (Birds Directive) – transposed into Irish law as European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477/2011).

DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. DEHLG, Dublin.

DoEHLG (2010). Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Revision, February, 2010. Department of the Environment, Heritage and Local Government.

EC (2000) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission.

EC (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC.

EC (2002) Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission.

EC (2006) Nature and biodiversity cases: Ruling of the European Court of Justice. Office for Official Publications of the European Communities, Luxembourg.

EC (2007a) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. Office for Official Publications of the European Communities, Luxembourg. European Commission.

EC (2007b) Interpretation Manual of European Union Habitats. Version EUR 27. European Commission, DG Environment.

EC (2018) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC

EC (2021) Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC

European Communities (Conservation of Wild Birds) Regulations, 1985, SI 291/1985 & amendments – http://www.irishstatutebook.ie

European Communities (Natural Habitats) Regulations, SI 94/1997, SI 233/1998 & SI 378/2005 – http://www.irishstatutebook.ie

Fossitt, J. A. (2000). A Guide to Habitats in Ireland. Dublin: The Heritage Council.

Habitats Directive (92/43/EEC).

Murphy, D.F. (2004) Requirements for the Protection of Fisheries Habitat During Construction and Development Works at River Sites. Eastern Regional Fisheries Board, Dublin.

Natural England (March 2007). Draft Guidance: The Assessment of Regional Spatial Strategies and Sub-Regional Strategies Under the Provisions of the Habitats Regulations.

NIEA (Nov 2014) Moneygal Bog SAC – Conservation Objectives

NIEA (2017) River Foyle and Tributaries SAC – Conservation Objectives

NPWS (2008) The Status of EU Protected Habitats and Species in Ireland. Conservation Status in Ireland of Habitats and Species listed in the European Council Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC.

NPWS of the DEHLG (2008) The Report on Status of Habitats and Species in Ireland: Technical Reports and Forms.

NPWS (2017) Conservation Objectives: Croaghonagh Bog SAC 000129. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS (2017) Conservation Objectives: Dunragh Loughs/Pettigo Plateau SAC 001125. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS (2017) Conservation Objectives: River Finn SAC 002301. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS (2019) Conservation Objectives: Lough Eske and Ardnamona Wood SAC 000163. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

NPWS (2021) Conservation Objectives: Lough Nageage SAC 002135. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

NPWS Protected Site Synopses and maps available on http://www.npws.ie/en/ProtectedSites/

NRA (2004) Environmental Impact Assessment of National Road Schemes – A Practical Guide, National Roads Authority, Dublin.

NRA (2004) Guidelines for the Treatment of Noise and Vibration in National Road Schemes (1 ed.). Dublin: National Roads Authority.

NRA (2005) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes. Dublin: National Roads Authority.

NRA (2006) Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. Dublin: National Roads Authority.

NRA (2009). Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. Dublin: National Roads Authority.

NRA (2008). The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads. Dublin: National Roads Authority.

OPR (2021) Appropriate Assessment Screening for Development Management. Office of the Planning Regulator, Dublin 7, Ireland

Scottish Natural Heritage (SNH) (July 2013) Assessing Connectivity with Special Protection Areas (SPA)

Stace, C. A. (1997). New Flora of the British Isles. Cambridge: Cambridge University Press.

Therivel R. (2009) Workshop Material on the Habitats Directive Assessment of Plans Levett-Therivel Sustainability Consultants on behalf of the Heritage Council, Kilkenny.

Therivel, R. (2009) 'Appropriate assessment of plans in England', Environmental Impact Assessment Review 29(4), pp. 261-272.