Appendix 9-4 WFD Compliance Assessment Report

1. Introduction

CDM Smith Ireland Ltd (CDM Smith) was requested by MKO, on behalf of Sheskin South Renewables Power Designated Activity Company (DAC), to complete a Water Framework Directive (WFD) Compliance Assessment for the planning application for a proposed wind farm development (Proposed Development) at Sheskin, Co. Mayo.

The Proposed Development comprises 21 no. turbines and grid connection and all associated site development works as set out in Chapter 4 of the Environmental Impact Assessment Report (EIAR).

1.1 Purpose of Assessment

The purpose of the assessment is to determine if any specific components or activities associated with the Proposed Development may compromise the WFD status objectives assigned by the Environmental Protection Agency (EPA) for the surface water and groundwater bodies that are associated with Proposed Development area. The assessment supplements Chapter 9 of the EIAR (Hydrology and Hydrogeology) submitted as part of the wind farm planning application.

1.2 Statement of Authority

CDM Smith in Ireland is a specialist hydrological, hydrogeological and environmental practice that delivers a range of water and environmental management consultancy services to the private and public sectors. CDM Smith conducts environmental risk assessments for a large variety of projects, including waste disposal, discharges to waters, flood risk assessment, and water resources management.

This WFD Compliance Assessment was prepared by Henning Moe (registered P. Geo.), a hydrogeologist with over 30 years of practical experience. He was the lead hydrogeologist for the Eastern River Basin District project which was part of Ireland's implementation of the first cycle of the WFD. He has subsequently supported Irish public bodies through the second and third cycles of WFD implementation, including Further Characterisation studies to help select WFD Programmes of Measures, and conducting risk assessments in support of Ireland's WFD reporting to the European Commission. As such, he is experienced with the WFD implementation process, including the details of EPA's water body status requirements and classification tests.

1.3 Water Framework Directive

The EU Water Framework Directive (2000/60/EC) is a holistic approach towards water resources management across the EU. The WFD was transposed into Irish law by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003).

The WFD requires that EU Member States achieve WFD 'Good' status objectives for all water bodies by year 2027 at the latest. Where a Member State assigns 'High' status objectives to water bodies, 'High' status must be maintained in 2027.

In Ireland, water body status objectives and water body status are assigned by the EPA in successive 6-year river basin management planning cycles. Status objectives define what must be achieved. Status assignment defines what was achieved. For each successive river basin management plan, EPA determines where objectives have been met and where they have not.

In all water bodies, Programmes of Measures are implemented to protect and/or improve their biological quality elements and environmental supporting conditions. There are two types of measures: Basic Measures, which are

statutory and enforceable (e.g., the Sustainable Use of Pesticides regulations); and Supplementary Measures, which are non-statutory and voluntary (e.g., pilot schemes, awareness campaigns).

As part of its WFD implementation, EPA also completes a risk assessment every 6 years, with outcomes that are published in 6-year river basin management plans. Water bodies are either 'At Risk' or 'Not At Risk' of meeting WFD environmental objectives. Where a water body is 'At Risk', EPA determines the 'significant pressures' that places the water body 'At Risk' and which may prevent the water body from meeting its status objective. This determination focuses the Programmes of Measures in that catchment.

Ireland is currently in the third cycle of WFD implementation, which covers the period 2022-2027. Ireland's latest river basin management plan, which was published in 2021, sets out the status objectives to be achieved by year 2027 (DHLGH, 2021). The latest available status classification for all water bodies covers the period 2016-2021.

It is noted that WFD status classification is assessed by EPA and reported formally by Ireland to the European Commission in 6 year river basin management plan cycles. The duration of the construction period for the Proposed Development is approximately 2 years (maximum). Hence, the likelihood of affecting status has a longer-term perspective and is more relevant to the operational phase of the Proposed Development.

The WFD also requires that 'designated sites' (protected areas) meet their environmental requirements and conservation objectives. Designated sites are: Natura 2000 sites (Special Areas of Conservation, SACs, with water-dependent habitats, and Special Protection Areas for species listed in the EU Habitats Directive); drinking water protected areas; bathing waters; shellfish waters; salmonid waters; and nutrient sensitive waters. Environmental requirements and conservation objectives for designated sites are stipulated in existing regulations or are being developed by the relevant public bodies (e.g., National Parks and Wildlife Service for SACs).

2. Water Body Identification

This section identifies the surface water and groundwater bodies that can potentially be affected by the Proposed Development.

2.6 Surface Water Body Identification

The Proposed Development, including the grid connection route, resides within WFD Catchment 33, Blacksod-Broadhaven, and specifically WFD Subcatchments:

- 33_1, Owenmore(Mayo)_SC_010
- 33_4, Owenmore(Mayo)_SC_020

The Proposed Development is within Sheskin Forest. With reference to **Figure 1**, the WFD reportable river water bodies that flow through the Proposed Development area, including the grid connection route, are:

- Sheskin_Stream_010 (code IE_WE_33S030150)
- Owenmore (Mayo)_040 (code IE_WE_33O040270)

Sheskin_Stream_010 flows into the Owenmore (Mayo)_020 river water body (code IE_WE_33S040200) to the east, in the downstream direction. The local streams that form the Owenmore (Mayo)_040 water body also flow into the Owenmore (Mayo)_020 water body, but do so several kms downstream and approximately 4 km west of Bellacorick.

There are no WFD reportable lake water bodies in the named subcatchments (i.e., no water bodies greater than 50 hectares in size).

2.7 Surface Water Body Status Objective

Based on EPA's 'Water' web viewer[5], both the Sheskin_Stream_010 and Owenmore (Mayo)_040 river water bodies, which originate within and flow through the Proposed Development site, are assigned 'High' status objectives. The Owenmore (Mayo)_020 water body is assigned a 'Good' status objective.

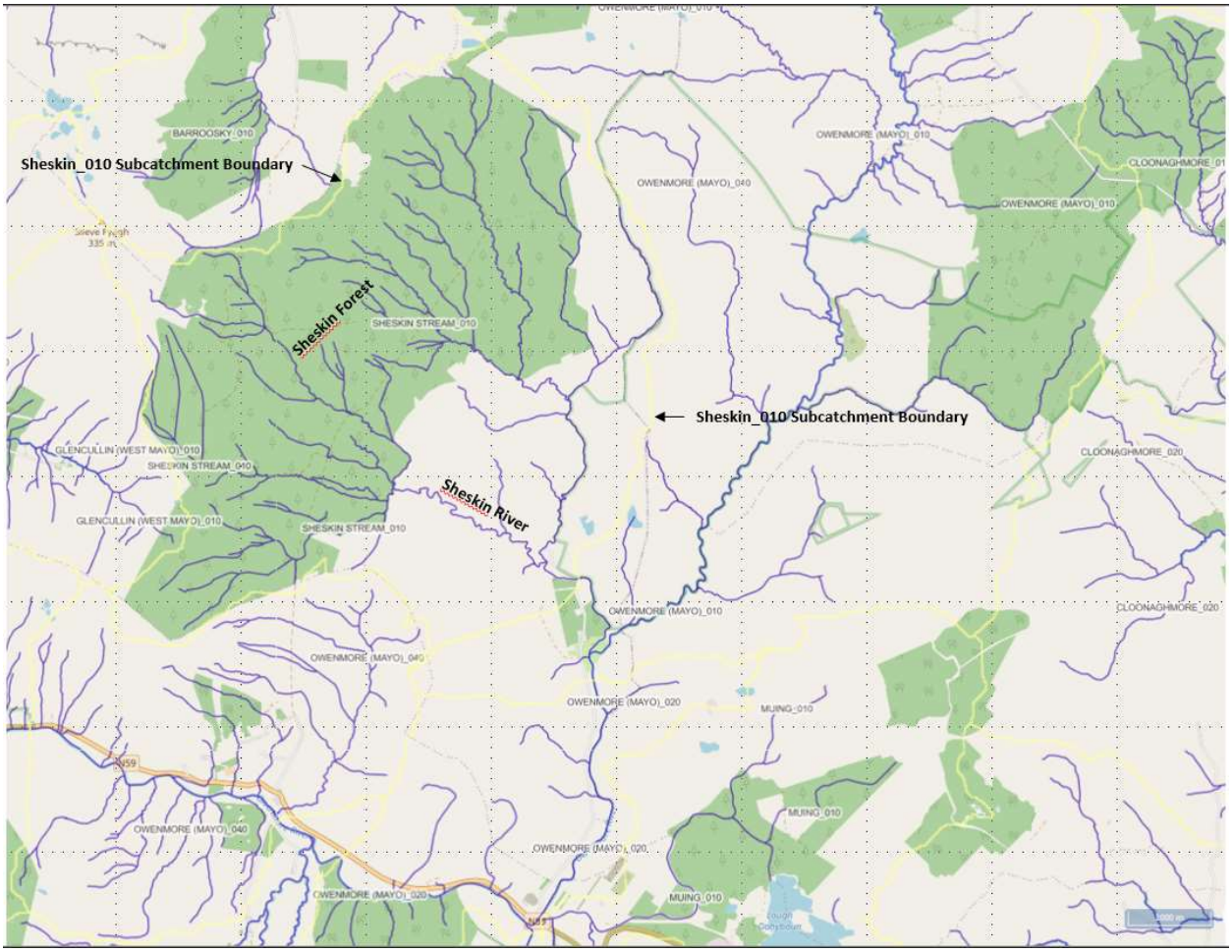

Figure 1: Surface Water Bodies Within and Downstream of the Sheskin Forest

The 'High' status objectives of river water bodies within the Proposed Development site reflect the pristine conditions which prevail and that EPA uses for reference purposes to judge status at other locations. Maintaining 'High' status of 'High' status objective water bodies is a WFD priority (DHLHG, 2021).

2.8 Surface Water Body Status Classification

Based on the latest available status classification (period 2016-2021)[6], both the Sheskin_Stream_010 and Owenmore (Mayo)_040 river water bodies were assigned 'High' status (indicated by the blue coloured river segments in **Figure 2**), which means WFD status objectives were achieved in the reporting period.

[5] https://gis-stg.epa.ie/EPAMaps/Water (last accessed 21 February 2023)
[6] https://gis-stg.epa.ie/EPAMaps/Water (last accessed 21 February 2023)

The Owenmore (Mayo)_020 water body was also assigned 'High' status (**Figure 2**), which means it exceeded its 'Good' status objective in the reporting period.

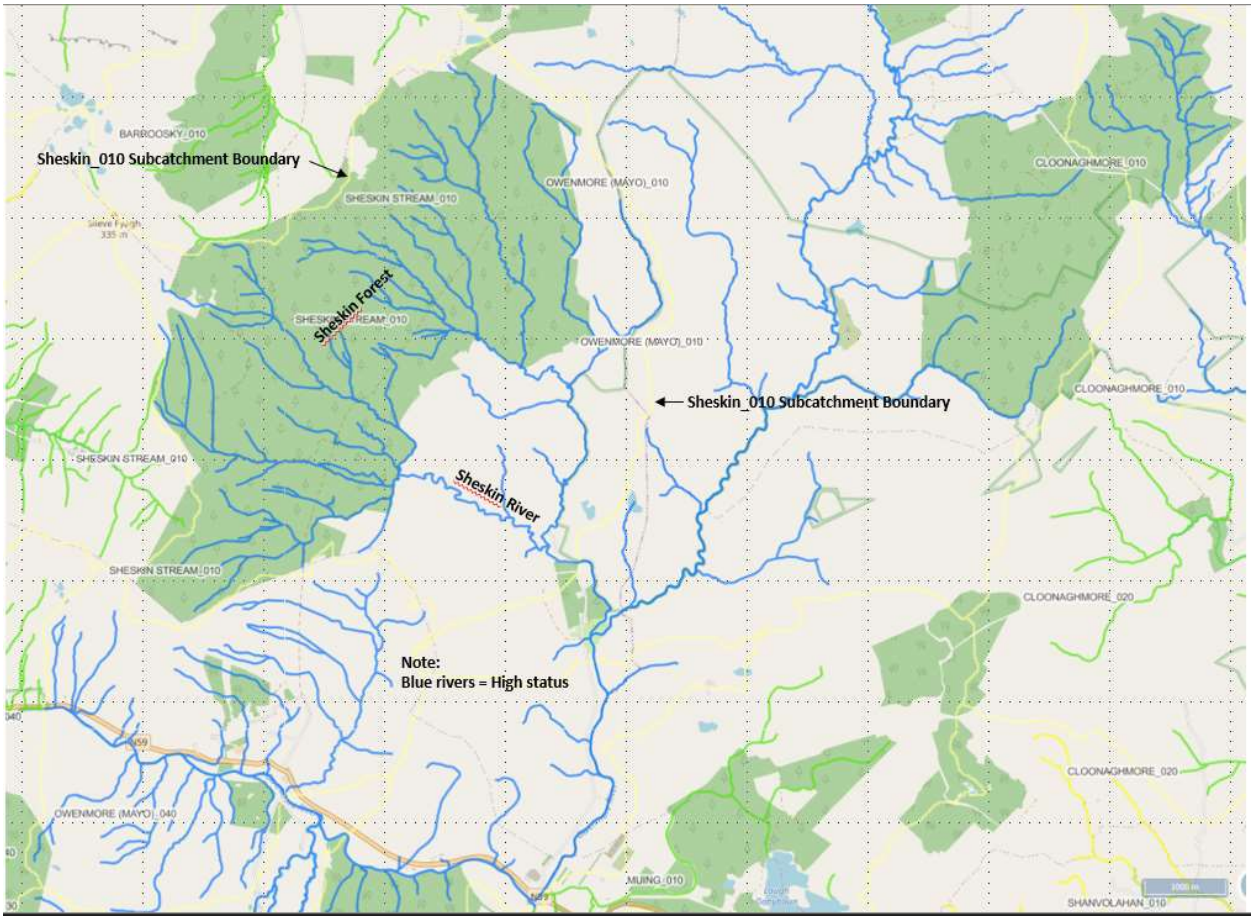

Figure 2: Surface Water Body Status, 2016-2021

2.9 Surface Water Body Risk Assessment

Based on the latest WFD risk assessment (period 2022-2027)[7], both the Sheskin_Stream_010 and Owenmore (Mayo)_040 river water bodies were classified as being 'Not At Risk' of failing to achieve WFD status objectives in 2027 (indicted by the green coloured river segments in **Figure 3**). The Owenmore (Mayo)_020 water body is also considered to be 'Not At Risk' (**Figure 3**) and no significant pressures have been identified by EPA that would place these water bodies 'At Risk' of failing to achieve WFD status objectives.

[7] https://gis-stg.epa.ie/EPAMaps/Water (last accessed 21 February 2023)

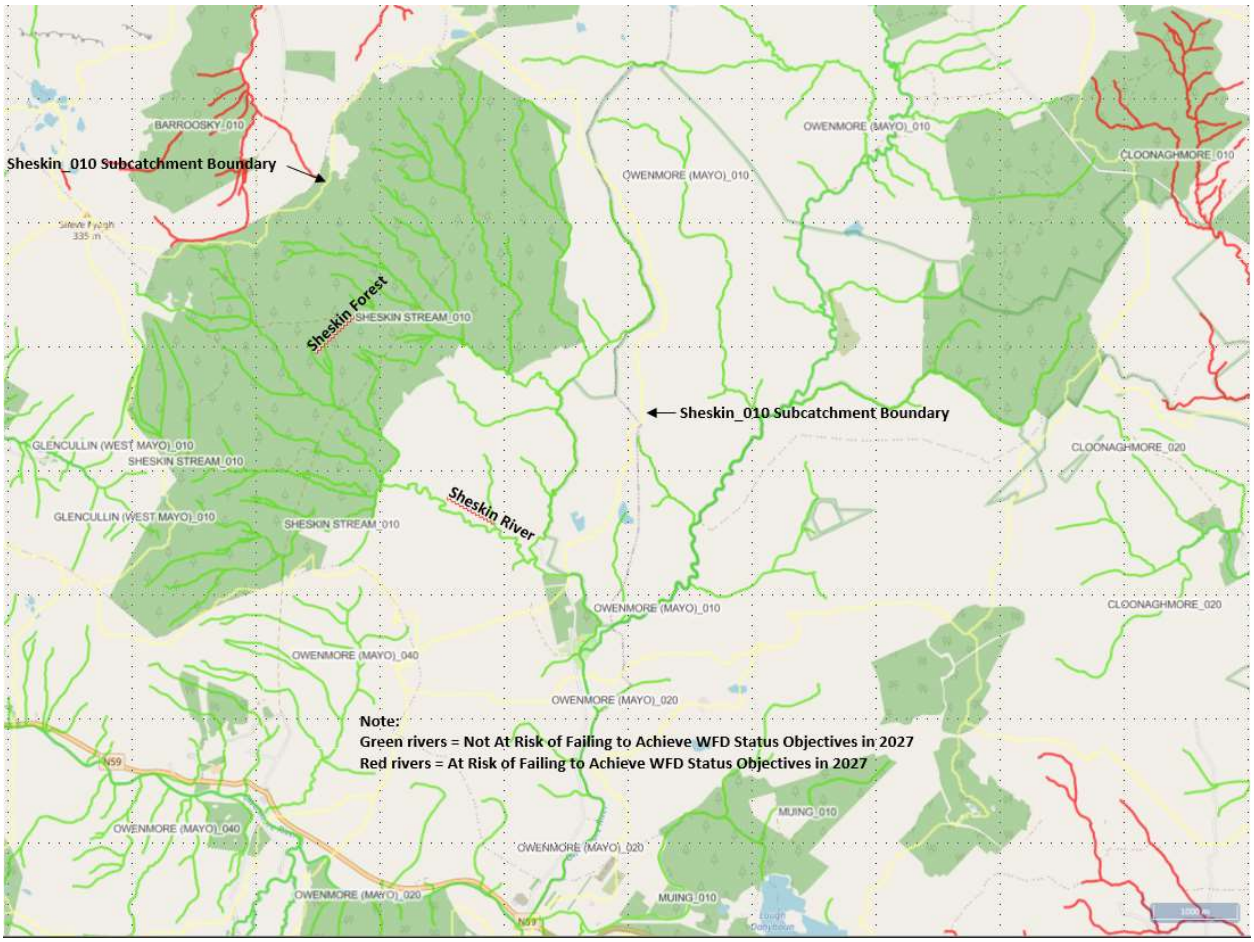

Figure 3: Surface Water Bodies Within and Downstream of the Sheskin Forest

2.10 Groundwater Body Identification

As documented in Chapter 6 of the EIAR, the Proposed Development site is principally underlain by the Belmullet groundwater body (code IE_WE_G_0057) which comprises bedrock which is classified by the Geological Survey Ireland (GSI) as 'poorly productive'.

The highest elevation, western-most part of Sheskin Forest is underlain by the Bangor groundwater body (code IE_WE_G_0052) which comprises bedrock which is part of a 'locally important' (from a water resources and supply persepctive and is classified by GSI as 'generally moderately productive'.

2.11 Groundwater Body Status Classification

There are only two categories of WFD status objectives for groundwater bodies in Ireland – 'Good' and 'Poor'. For the latest status classification period (2016-2021), both groundwater bodies were assigned 'Good' status which means that their WFD status objectives were met in the reporting period.

2.12 Groundwater Body Risk Assessment

Both groundwater bodies were also classified as being 'Not At Risk' of failing to achieve WFD status objectives in in year 2027, and significant pressures have been identified by EPA that are impacting on these groundwater bodies.

3. WFD Compliance Assessment

3.1 Risk Factors - Surface Water

Without mitigation actions, the Proposed Development has the potential to affect the water quality and hydromorphology of streams that flow east from and through the Proposed Development area towards the Owenmore River. Effects can be carried further downstream within the Owenmore River catchment. The main items that can affect water quality and associated aquatic habitats are associated with:

- Physical damage to streambanks and streambeds.
- Sediment load to, and sedimentation of, streambeds.
- Chemical load from drainage of peat, including nutrients (nitrogen and phosphorus) and both suspended organic matter and dissolved organic carbon.
- Contamination events associated with accidental leaks and spills of fuel or other chemicals.
- Changes to natural flow conditions and water quality (e.g., pH) in streams as a result of modifications to the drainage network (NPWS, 2015).

The principal activities that may contribute to effects are:

- During construction - tree-felling, earthworks, drainage/dewatering, culverting, and construction and upgrade of access roads (especially near streams).
- During operations – maintenance works and accidental leaks and spills.
- During decommissioning – same as during construction, but on a smaller scale.

3.2 Risk Factors - Groundwater

Without mitigation measures, the Proposed Development can affect groundwater conditions, notably groundwater quality. Items that can result in effects are:

- Contamination events associated with accidental leaks and spills of fuel or other chemicals.
- Changes to shallow groundwater flow patterns in peat and subsoils from the proposed drainage and excavations of borrow pits.

The principal related activities that may contribute to effects are:

- During construction – use of machinery, poor handling of fuels and chemicals, and drainage.
- During operations – maintenance works and accidental spills and leaks.
- During decommissioning – same as during construction, but on a smaller scale.

3.3 Risk of Affecting Surface Water Body Status

EPA's status classification scheme for surface water bodies involves the consideration of:

- Biological quality elements of surface water, per the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019. S.I. 77 of 2019 – e.g., fish, macroinvertebrates. EPA conducts surveys, and the data and findings inform the classification, for example from review of Q-survey data.

- Water quality conditions that support the biological quality elements, per the same regulations. EPA reviews water quality data in context of environmental quality standards (EQS) for 'Good' or 'High' status conditions, as well as data trends and patterns.
- Measurable changes to biological quality elements against established reference conditions that apply for 'Good' and 'High' status.
- Flows and levels of surface waters.
- Visual indicators of impact, such as hydromorphological alterations to streams.
- Research publications and review of other 'best available information', and applying expert judgment.

In the context of the Proposed Development, the current 'High' status conditions would be at risk from longer-term changes to water quality and river morphology, specifically caused by:

- Additional chemical and sediment loading.
- Changes in the pH of streams.

Without mitigation, longer-term effects can result in the deterioration of the current 'High' status. With mitigation (see Section 4 below), the potential for effects is much reduced, especially during the operational phase, as the major earthworks will be completed and permanent drainage controls will be in place. The construction phase is short-term (2 years). The operational phase is 35 years. Maintenance works are still needed, but this is on a much smaller scale compared to construction. The same applies for decommissioning.

Individual, accidental pollution events are unlikely to affect water body status, although serious contamination events (e.g., of hazardous substances) can have longer-term ramifications on aquatic biota.

With regard to nutrients, ammonia and orthophosphate are the principal constituent of concern. The draining of peat can result in leaching of ammonia to water (e.g., Daniels *et al.,* 2012), and the unionized form of ammonia, NH_3, can be toxic to fish. However, NH_3 (also referred to as 'free ammonia', only forms at pH values that are higher than those that are recorded at the site (Chapter 9 of the EIAR). Orthophosphate is the biologically available form of phosphorus, and is a pollutant that is associated with forestry pressures (in addition to, for example, agriculture).

Since EPA began the national WFD monitoring programme in 2007, water quality data from the Sheskin River downstream of the Proposed Development site boundary at monitoring station RS33S030150 (see Chapter 9 of the EIAR) show total ammonia concentrations (NH_3-N) that are mostly below the limits of detection of 0.02 or 0.03 mg/l (in the period of record), with sporadic detection 'spikes' up to 0.05 mg/l.

The average annual EQS for total ammonia is 0.04 mg/l (as N) for WFD 'High' status. Annual average concentrations between 2007 and 2022 are presented in **Figure 4** based on data downloaded from EPA's 'catchments website.[8] The annual average concentrations are below the EQS in all years od record.

The average annual EQS for orthophosphate is 0.025 mg/l (as P) for WFD 'High' status. Average annual concentrations between 2007 and 2022 are presented in **Figure 4** based on the same data source. The average annual concentrations are below the EQS in all years except 2009 when the average annual concentrations equaled the EQS.

[8] https://www.catchments.ie/data/#/waterbody/IE_WE_33S030150?_k=4fpfkl

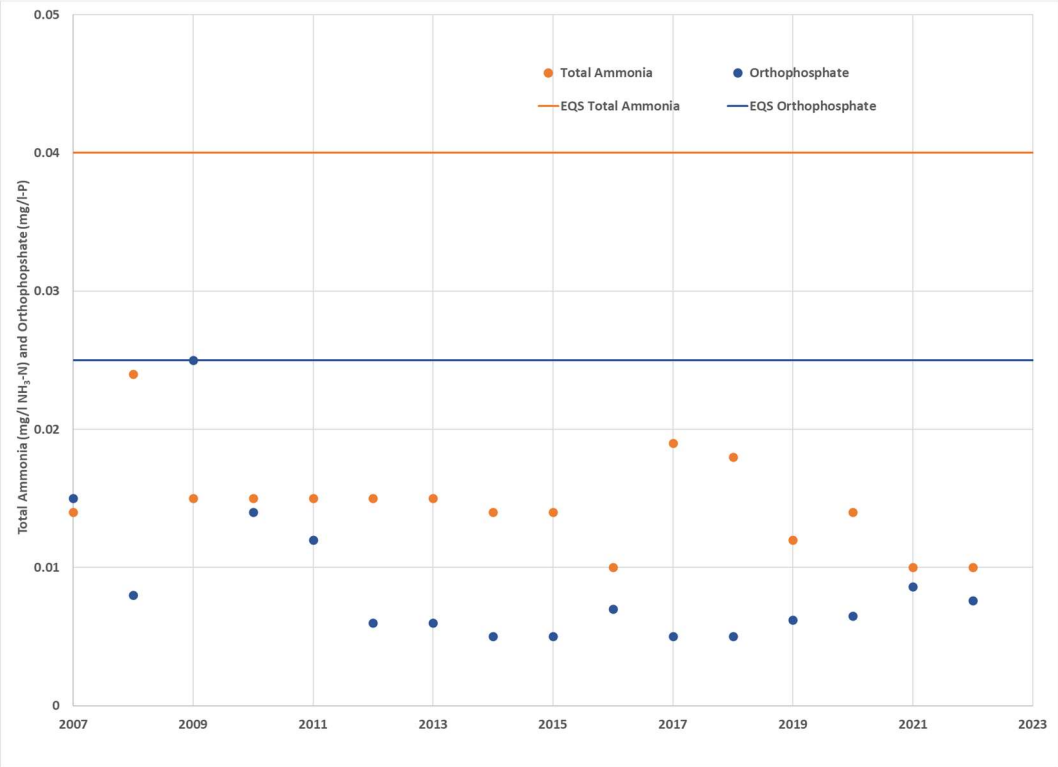

Figure 4: Annual Average Concentrations of Total Ammonia and Orthophosphate, 2007-2022, EPA Station RS33S030150

The criteria that can be used to identify and measure potential effects (if any) from the Proposed Development on water status classification are:

- The EQSs which are stipulated in the Surface Water Regulations.
- Observations of river morphological conditions.
- Rapid assessment and small stream impact score surveys, based on established procedures (LAWPRO/EPA, 2022).

A proposed monitoring programme is described in Chapter 9 of the EIAR for all phases of the Proposed Development. Proposed mitigation measures are also summarised in Section 4 below.

3.4 Risk of Affecting Groundwater Body Status

When assigning WFD status to groundwater bodies (GWBs), EPA considers:

- 'Quantitative status', which is determined by comparing (known) total abstractions and estimated total recharge volumes across whole GWBs, as well as reviewing trends in groundwater levels a dedicated monitoring well network.
- 'Qualitative status', whereby groundwater quality data from a network of wells and/or springs are compared with 'chemical test' threshold values which are stipulated in the European Union Environmental Objectives (Groundwater) (Amendment) Regulations 2019 (S.I. 366 of 2016). EPA also reviews data trends and patterns to inform technical judgement.

A GWB can be assigned 'Poor' quantitative status but 'Good' qualitative status, or vice versa, and the EPA uses the least favourable outcome to assign final status. A GWB can only be at 'Poor' or 'Good' status overall, and there are no groundwater bodies with 'High' status objectives. 'Good' status is the default status objective for all GWBs.

The Proposed Development does not include any large or longer-term groundwater abstractions. There will be a need for temporary sump pumping during construction of foundations and the Borrow Pits, but the volumes are expected to be small and manageable. The pumping duration is also brief, and the temporary effect will be imperceptible in context of the overall water balance of Belmullet GWB.

Accordingly, the Proposed Development will not affect the WFD quantitative status classification of either the Belmullet (or Bangor) GWB.

Groundwater quality in the bedrock aquifers is relevant because groundwater provides limited baseflow to the streams within the Proposed Development site, especially during prolonged dry weather, low-flow conditions (see Chapter 9 of the EAIR). Groundwater is also part of the environmental supporting conditions of the peat.

There are no activities planned with the Proposed Development that will influence the groundwater quality in the bedrock aquifers in the long-term. Accidental spills and leaks can occur, which can affect groundwater quality locally, but these would likely be brief/episodic. Individual spill and short-term pollution events during construction are unlikely to affect GWB status. A localised groundwater quality issue within the Proposed Development site would not influence the determination of status for the whole groundwater body.

Accordingly, the Proposed Development will not affect the WFD qualitative status of either the Belmullet or Bangor GWBs.

4. Mitigation to Prevent Status Deterioration

In order to mitigate against potential negative effects on surface water and/or groundwater quality, as well as flow volumes and patterns, mitigation measures will be implemented during all phases of the Proposed Development. Proposed measures are outlined below, as derived from Chapter 9 of the EIAR.

4.1 Construction Phase – Drainage and Earthworks

Examples of proposed measures during the construction phase are summarised in **Table 1**. Water quality protection incorporates sequential barriers of protection within the proposed drainage management system.

Table 1: Examples of Mitigation Measures During Construction Phase

Mitigation Type	Description
Avoidance Controls	▪ 50m buffer zones to natural watercourses. ▪ Working in appropriate weather and suspending certain work activities in advance of or when periods of heavy rainfall occur.
Source Controls	▪ Upslope interceptor drains and downslope swales, diversion drains, culvert pipes.
	▪ Designated works areas and minimizing footprints ▪ Covering stockpiles and promoting vegetation growth.
In-line Controls	▪ Erosion and velocity control measures such as sandbags, silt fences, check dams, oyster bags filled with gravel, filter fabrics, straw bales, weirs or baffles; and/or other similar/equivalent or appropriate systems. ▪ Collection sumps, temporary sumps, pumping systems. ▪ Sediment traps, attenuation ponds.
Treatment Controls	▪ Settlement ponds

Mitigation Type	Description
	▪ Sediment traps ▪ Silt fences, filter fabrics, silt bags, sumps
Discharge/Outfall Controls	▪ Level-spreaders to generate diffuse low-energy discharges ▪ Buffered outfalls to break energy of discharges and reduce soil erosion. ▪ Vegetation filters. ▪ Weirs to help control discharges.
Accidental spills and leaks	▪ Construction and environmental management plan. ▪ Surface water management plan ▪ Visual inspections and monitoring

4.2 Operational Phase

Mitigation measures during the operational phase involve applying best practice methods for maintenance of the drainage management system and roads, and avoiding accidental spills and leaks.

Maintenance of interceptor drains and settlement (stilling) ponds is especially important during operations to sustain their functionality, as they serve to buffer runoff during periods of high rainfall, by retaining water until the storm has receded and reducing the hydraulic and sediment loading to water courses. Settlement ponds have been designed in consideration of greenfield runoff rates and 6-hour duration, 1 in 10 year storm events.

4.3 Decommissioning Phase

Potential effects during decommissioning are similar to those associated with construction, but the magnitude of activity is much reduced. It will also be possible to reverse or at least reduce any potential effects caused during construction, and to a lesser extent operation, by rehabilitating constructed areas such as turbine bases and hard standing areas. This will be done by covering with vegetation to encourage vegetation growth, which will reduce runoff and sediment transport.

The wind farm site roadways will be kept and maintained following decommissioning of the wind farm infrastructure, as these will be utilised by forestry works and other participating landowners.

The underground cables connecting the site infrastructure to the onsite substation will be removed, while the ducting itself will remain in-situ, as this is considered to have less of a potential environmental impact in terms of earthworks and, therefore, the possibility of mobilizing suspended sediments to/in watercourses.

The turbines will be removed and transported offsite along their original delivery route. The disassembly and removal of the turbines will not have an impact on the hydrological/hydrogeological environment at the wind farm site.

Other effects such as potential contamination by fuel leaks will remain, but this will be of reduced magnitude.

4.4 All Phases – General Items

Other aspects of potential surface water and groundwater quality impacts will be mitigated by best practice methods as set out below, with an emphasis on mitigation by avoidance. These apply to all phases of the Proposed Development.

Accidental Spills and Leaks of Fuel and Chemicals

- Onsite refueling of machinery will be conducted using a mobile double skinned fuel bowser.
- Onsite refueling will be conducted by trained personnel only.

- The fuel bowser, a double-axel, custom-built, refueling trailer will be refilled offsite, and will be towed around the site by a 4x4 vehicle to where machinery is located.
- The 4x4 vehicle will carry fuel absorbent material and pads in the event of any accidental spillages.
- The fuel bowser will be parked on a level area in the construction compound when not in use and only designated trained and competent operatives will be authorised to refuel plant on site.
- Mobile measures such as drip trays and fuel absorbent mats will be used during all refueling operations.
- A permit to fuel system will be put in place.
- Taps, nozzles or valves associated with refueling equipment will be fitted with locks.
- Refueling will not be permitted within the 50 m buffer zone of streams.
- All fuel storage areas will be bunded appropriately for the duration of the construction phase.
- All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area.
- Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage.
- The electrical control building (at the substation) will be bunded appropriately to the volume of oils likely to be stored and to prevent leakage of any associated chemicals to groundwater (or surface water). The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor.
- The plant used during construction will be regularly inspected for leaks and fitness for purpose.
- An emergency plan for the construction phase to deal with accidental spillages is included within the Construction and Environmental Management Plan.

Wastewater:

During the construction phase, self-contained port-a-loos with integrated waste holding tanks will be used at each of the construction compounds, maintained by the providing contractor, and removed from site on completion of the construction works. No wastewater will be discharged onsite.

During the operational phase, wastewater from staff welfare facilities in the control buildings will be managed by means of a sealed storage tank. Wastewater generated will be removed by permitted waste collectors for offsite disposal at wastewater treatment plants. No wastewater will be discharged onsite.

Cement-based compounds:

- No batching of wet-concrete products will occur onsite. Ready-mixed supply of wet concrete products and emplacement of pre-cast elements will be relied on, also for culverts.
- Where concrete is delivered onsite, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of concrete contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined concrete washout ponds.
- Weather forecasting will be used to avoid pouring concrete on days of heavy rainfall.
- Pour sites will be kept free of standing water and plastic covers will be ready in case of sudden rainfall events.

4.4 Residual Effects After Implementing Mitigation Measures

With the implementation of the mitigation measures outlined above, no likely significant effects on surface water or groundwater receptors will occur. As a result, risks are managed and the current (2016-2021) WFD status classification of named water bodies will be maintained.

5. Designated Sites

As presented in Chapters 6 and 9 of the EIAR, the Proposed Development site directly borders three SACs:

- Slieve Fyagh Bog SAC to the west. The headwaters of Sheskin River are partly within and receives runoff from the SAC.
- Carrowmore Lake Complex SAC to the west and south, which is in a different subcatchment from Sheskin River but is part of the headwaters of the local streams that for the Owenmore(Mayo)_040 water body (relevant to the grid connection route).
- Glenamoy Bog Complex SAC to the northwest, which is also in a different subcatchment from Sheskin River.

Each of the SACs have blanket bog among their qualifying interests, along with other specific habitats and species (see Chapter 6 of the EIAR for details). The SACs are part of the same upland bog system that is present within the Proposed Development site. For this reason, further consideration was given to the potential effects of the Proposed Development on each SAC.

In the context WFD compliance, direct effects on the conservation objectives of the SACs will not occur since the Proposed Development is not directly within the SACs. However, indirect effects can potentially occur, which is considered below.

5.1 Draining of Peat

The shallow interceptor drains that are planned upslope of infrastructure components, including access roads, are designed to capture greenfield runoff. Establishing new drains involves excavation works. When saturated peat is cut, drainage of peat will occur. This causes lowering of water levels in the upslope direction. The hydraulic effect can propagate upslope with time, and this distance will be a function of the properties of the peat, the prevailing climatic conditions, and potential hydraulic interaction with other (existing) drains in the system. This described in greater detail in Chapter 9 of the EIAR.

If the hydraulic effect extends to the SACs, the peat in the SACs could become partially drained. The relevant question becomes – will the SACs become hydraulically affected by the Proposed Development?

There is no simple rule of thumb that can be applied to estimate how far the hydraulic effect may extend. This is because bog science is location-specific and bog hydrology is both dynamic and transient, responding to changes in event-based, seasonal, and longer-term climatic conditions. Potential effects at distance will also take time to be established and is considered more relevant for the operational phase (35 years) than the construction phase (2 years).

In the UK and Irish scientific literature, there are empirically based examples of drainage effects (see Chapter 9 of the EIAR for details). For the upland bog setting at Sheskin, and from a weight-of-evidence approach, a distance of 100 m is considered reasonable and pragmatic as a criterion to consider potential effects.

The nearest distances from respective SAC boundaries to planned drainage features in Sheskin Forest are:

- Slieve Fyagh Bog SAC – 230m (access track to turbine T5 and met mast).

- The Carrowmore Lake Complex SAC – 25m (hardstanding for turbine T2).
- The Glenamoy Bog Complex SAC – 195m (access track to turbine T12).

The areas where planned infrastructure is within or approaches the 100 m distance criterion in the upslope direction are:

- Turbines T2 and T17 in the southwestern portion of the site (Carrowmore Lake SAC)
- Turbines T3 and T5/met mast (Slieve Fyagh Bog SAC)
- Turbine T12 (Glenamoy Bog Complex SAC).

As presented in Chapter 9 of the EIAR, assuming that the hydraulic effect translates 100 m into a SAC, the maximum estimated area that would be hydraulically influenced by turbines T2 and T17 is 5 hectares, or 0.14% of the total SAC area. This also assumes that the effect will translate across a topographic divide.

Although effects along SAC boundaries can theoretically add up, the probability of hydraulic effects extending into SACs is low. This is because the majority of drainage is at distance of 250 m or more from the SAC boundaries and the bog system is rainfall-dependent in a wet, upland setting with high and frequent rainfall. The Sheskin Forest is also already extensively drained by the forestry operation. For these reasons, no likely significant effects on the SACs from drainage are expected.

5.2 Surface Water Quality Impairment

Any surface water quality impairment associated with the Proposed Development will be transmitted in downstream directions. Without mitigation measures, the planned activities in Sheskin Forest can affect local streams and the Sheskin and Owenmore Rivers. Activities along the grid connection route can also affect the small tributaries that discharge south to Owenmore River (west of Bellacorick).

Near its confluence with Sheskin River and north of Bellacorick, the Owenmore River borders the Bellacorick Bog Complex SAC. Hence, the Proposed Development is hydrologically, albeit indirectly, linked to the Bellacorick Bog Complex SAC. However, a potential effect on the SAC is considered highly unlikely. This is because the SAC is on the eastern flood plain of Owenmore River and the SAC is dependent on environmental supporting conditions (including surface water and groundwater inflows) from the east (within the SAC).

The Owenmore River also borders the Bellacorick Bog Complex SAC at Bellacorick by the N59 junction, but this time south of the river. This portion of the SAC receives inflows from the south and the SAC at this location is considered to be outside of any possible influence of Sheskin River or the local streams that flow past the grid connection route.

By extension, the Owenmore River also borders the Owenduff/Nephin Complex SAC/SPA further downstream, more than 5 kms west of Bellacorick. The SAC/SPA also drains from the south, and for the same reason, the SAC/SPA is considered to be outside of any possible influence of Sheskin River or the local streams that flow past the grid connection route.

With regard to the grid connection route, this follows an existing roadway south from Sheshkin Forest. It passes the eastern boundary of the Carrowmore Lake Complex SAC but neither the roadway nor the grid connection crosses the SAC.

Several small tributaries drain south from the Carrowmore Lake Complex SAC to the Owenmore River (approximately 4 km downstream from Bellacorick). The tributaries are part of the Owenmore (Mayo)_040 water body.

As described in Chapters 4 and 9 of the EIAR, the construction of the grid connection route involves earthworks (trenching, ducting and filling) and stream crossings using existing bridges and trenchless technology (horizontal drilling). The SAC is hydrologically upstream of the route, and for this reason, there will be no deterioration of water quality or WFD status of water bodies within the SAC.

The Slieve Fyagh Bog SAC and Glenamoy Bog Complex SAC referred to in Section 5.1 are in separate subcatchments from the Proposed Development. For this reason, there will be no deterioration of water quality or WFD status of water bodies within the SAC.

6. Summary

The Proposed Development site is located within the subcatchment of Sheskin River which has a 'High" status objective assigned by EPA. The Proposed Development is, therefore, within a priority subcatchment for protection.

For the latest available WFD status classification period (2016-2021), all water bodies (surface water and groundwater) that are associated with the Proposed Development site met their WFD status objectives.

Deterioration of WFD status is not permitted by the WFD and Irish Law. The Proposed Development has the potential to cause deterioration of status for surface water bodies. For this reason, mitigation measures are necessary and proposed to break potential source-receptor linkages and provide for attenuation of suspended sediments especially. The means and methods of achieving the necessary levels of protection are proven and established based on existing guidance and practical experiences from other similar development. The proposed mitigation measures will be strictly enforced.

All measures are incorporated into the CEMP, which the Contractor will be legally required to adhere to. Extensive monitoring will be practiced, according to the surface water management plan presented in Appendix 4-4 and as proposed in Chapter 9 of the EIAR, in order to be able to track water quality and identify any potential effects.

With the proposed mitigation measures, the Proposed Development is will not cause a deterioration in the WFD status of water bodies within or downgradient of the site. Potential significant effects on adjoining SACs are also unlikely which means the Proposed Development will not cause deterioration of water quality or WFD status of water bodies within SACs.

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