Appendix 9-1 – WFD Compliance Assessment

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Scart Mountain Wind Farm

Water Framework Directive Assessment Report

December 2024

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Scart Mountain Windfarm

Water Framework Directive Assessment Report

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1.0 INTRODUCTION

TOBIN Consulting Engineers were requested by FuturEnergy Ireland to complete a Water Framework Directive (WFD) Compliance Assessment for a planning application for a proposed wind farm project at Scart Mountain, Co. Waterford (proposed project). The proposed project comprises of 15 no. turbine windfarm, Grid Connection Route (GCR), proposed works areas on the Turbine Delivery Route (TDR) and all ancillary infrastructure and associated site development works.

The purpose of this WFD assessment is to determine if any specific components or activities associated with the proposed project will compromise WFD objectives or cause a deterioration in the status of any surface water or groundwater body and/or jeopardise the attainment of good surface water or groundwater status. This assessment will determine the water bodies with the potential to be impacted, describe the proposed mitigation measures, and determine if the project is in compliance with the objectives of the WFD.

1.1 Background

The European Union (EU) Water Framework Directive (WFD) (2000/60/EC) was established in 2000 in order to provide a framework for the protection of surface waterbodies (including rivers, lakes, coasts, estuaries and heavily modified waterbodies) and groundwater.

The Directive was transposed in Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003). The WFD is implemented through the River Basin Management Plans (RBMP) which comprises a six-yearly cycle of planning, action and review. RBMPs include identifying river basin districts, water bodies, protected areas and any pressures or risks, monitoring and setting environmental objectives. In Ireland the first RBMP covered the period from 2010 to 2015 with the second cycle plan covering the period from 2018 to 2021. The Water Action Plan 2024 is Ireland's roadmap to protect and restore our rivers, lakes, estuaries, coastal waters and groundwaters.

The WFD requires that the ecological status of all surface waterbodies is assessed that pressures are identified and that programmes of measures are put in place in order to maintain or achieve Good Ecological Status (GES) or Good Ecological Potential (GEP) in heavily modified and artificial waterbodies. Ecological status is assessed by considering a range of biological, hydromorphological, chemical and physico-chemical quality elements as well as specific pollutants.

Ecological status and the status of the quality elements is assessed and classified as one of the following:

- High;
- Good;
- Moderate;
- Poor; and
- Bad.

Member states must provide information on anthropogenic pressures. The magnitude of pressure and associated impact affects the status classification.

This report provides a WFD assessment for the proposed project. This report forms part of the Environmental Impact Assessment Report (EIAR) and should be read in conjunction with Chapter 9 Hydrology and Hydrogeology of the EIAR. Consideration of the WFD is required for

any Development application which has the potential to cause deterioration in the ecological and chemical status of a waterbody or to compromise improvements which might otherwise lead to a waterbody meeting its WFD objectives.

Any new development must therefore ensure that four objectives are satisfied:

- Objective 1: Deterioration in the ecological status of the waterbody or connected waterbodies (within the same catchment) is prevented;
- Objective 2: Impediments to the attainment of GES status for the waterbody are not introduced;
- Objective 3: Attainment of the WFD objectives for the waterbody is not compromised;
- Objective 4: Achievement of the WFD objectives in other waterbodies within the same catchment are not permanently excluded or compromised.

1.1.1 Assessment methods

This WFD Assessment evaluates the potential for the proposed wind farm to have non-temporary effects on WFD parameters of freshwater waterbodies. Transitional and coastal waterbodies were considered and scoped out from further assessment due to the inland location.

There is no formal guidance for carrying out WFD assessments for the freshwater environment. The Northern Ireland Environment Agency provides guidance for EIA developments on carrying out a WFD assessment (Northern Ireland Environment Agency, 2012). No specific guidance exists for freshwater waterbodies; however, this guidance was used as the basis of the UK's Planning Inspectorate (PINS) Advisory Note 18 'Water Framework Directive' June 2017 (PINS 2017) in which it sets out the stages of an assessment. In principle, the approaches outlined in each of these guidelines are similar. These documents have been used to inform the approach taken for this WFD assessment, which is as follows:

- Screening: Identify and record the current status, future objectives and any relevant activities that may influence the waterbodies in the locality of the proposed wind farm .
- Scoping: For each WFD element, record where the construction, operation and/or decommissioning could affect the status.
- Assessment: Evaluate the extent to which activities influence (positively or negatively) the WFD elements; the likelihood of non-temporary effects; the data available and confidence inthe assessment; and any next steps for data collection and evaluation as required.
- Mitigation: Identify where actions may be possible and appropriate to mitigate any negative effects of the development.

Where the assessment identifies a component or activity which is not compliant with WFD objectives, but which may become compliant with appropriate mitigation.

In line with this guidance a 2km buffer zone was applied for assessing protected areas. For clarity and brevity purposes, the 2km buffer and the full list of identified protected sites (including those which are considered coastal water specific) are maintained for all assessments.

1.1.2 Assessment criteria

This assessment needs to evaluate where activities during the construction, operation and decommissioning may influence WFD waterbodies. Evaluation will be made against those quality elements that make up the classification of ecological status. For the freshwater waterbodies that intersect the proposed wind farm , these are shown in Table 1-1 Ecological

Status is defined as alteration from 'natural' conditions; see the official WFD normative definitions in the box below.

Table 1-1: Description of elements for the classification of Ecological Status that are recorded for those waterbodies intersected by the proposed wind farm .

WFD element	*Description of elements for the classification of Ecological Status*
Biological Status	*Composition and abundance of aquatic flora (including macrophytes and phytobenthos)* *Composition and abundance of benthic invertebrate fauna* *Composition, abundance and age structure of fish fauna*
Chemical Status	*Elements that support the biological elements including:* • *Temperature* • *pH* • *Ammonia* • *Phosphate*
Hydrology Status	*Quantity of water flow* *Connection to groundwater bodies*
Morphology Status	*River depth and width variation* *Structure and substrate of the riverbed* *Structure of the riparian zone*

Source: WFD Directive 2000/60/EC

This assessment is reliant of identifying those effects that are non-temporary i.e., 3years for biological status, Hydrology and Morphology and 12 months for Chemical status.

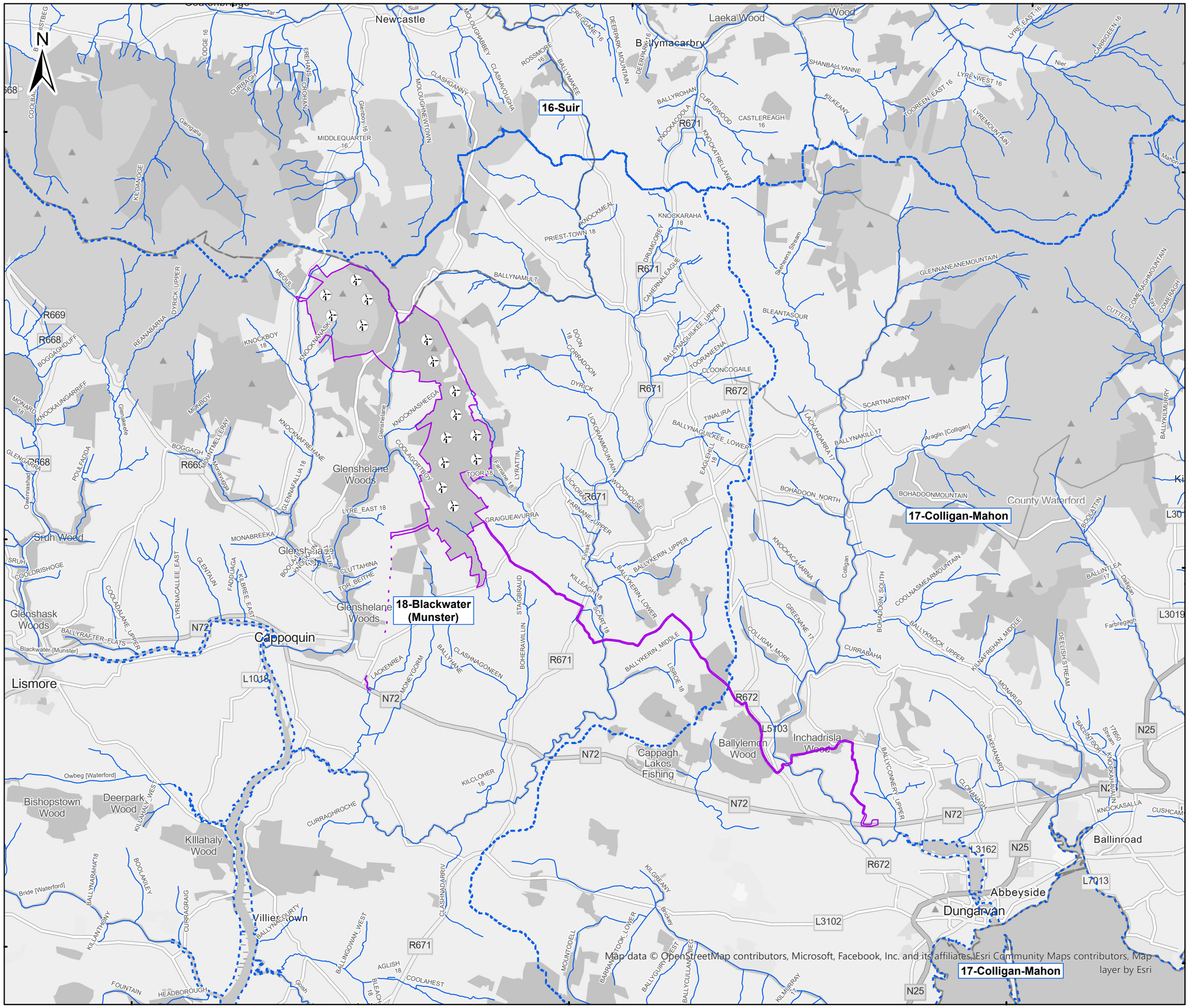
To inform this assessment the following datasets owned by the EPA and available online have been used:

- Catchment Data - River Waterbodies GIS
- Catchment Data - Lake Waterbodies GIS
- Surface Water Classification Status and Objectives results for 2016-2021
- Groundwater Classification Status and Objectives results 2016-2021.

2.0 STAGE 2 SCREENING AND SCOPING

On a national stage, the Environmental Protection Agency (EPA, 2022) has published the Water Quality in Ireland Report 2016-2021 which provides the latest assessment of the quality of Ireland's rivers, lakes, estuaries, coastal and groundwaters. Water quality nationally has declined. Water quality at the proposed wind farm site has remained good in the last 10 years with the Glennafallia_010, The Finisk_030 and the Farnane_010 currently at high status. The proposed wind farm for Scart Mountain lies entirely within the Blackwater (Munster) (ID 18) Water Framework Directive (WFD) catchment. The Suir (ID 16) lies to the north, outside the boundary of the proposed project and has been screened out as there is no hydrological connection. The regional natural surface water drainage pattern, in the environs of the proposed project is outlined in Figure 2-1.

For this assessment to inform Cycle 3, there are 17 waterbodies achieving High Status, 122 achieving Good Status, 23 achieving Moderate Status, 11 at Poor Status and 23 waterbodies that do not have status assigned for Cycle 3 within the Blackwater (Munster) Catchment.



Legend

- Proposed project boundary
- Proposed Turbine layout
- Catchments
- WFD - River Water Bodies

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Kilometres

NOTES

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Scart Mountain Wind Farm

Title:

Figure 2-1
Regional Catchment Delineation

Scale @ A3: 1:80,000

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Draft: A

2.1.1 Surface Water Bodies

The river waterbody types located near the proposed wind farm site are primarily small to medium size streams with moderate to steep gradient. These streams join either the Glenshelane or the Farnane to the east, the Glennafallia to the west or the Finisk to the south before ultimately flowing into the Blackwater River, located to the southwest of the proposed project as shown in Figure 2-1.

More locally, River Sub basins are present at the proposed project as shown in Figure 2-2. The north and west of the proposed wind farm lies within the Glennafallia_010, The Glennafallia_020 The Glenshelane_010 subbasins, the east of the proposed wind farm lies within The Fernane_010 subbasin, with the south of the proposed wind farm within the Finisk_030 and Moneygorm_010 subbasins. The majority of the proposed wind farm lies within the catchment of the Blackwater River. The proposed wind farm is subdivided into two sub catchment areas; the south and east sections lie within the Finisk_SC_010 and the north and western part lies within the Blackwater [Munster]_SC_140.

The proposed TDR works are located in Moneygorm_010. The proposed GCR crosses the following EPA waterbodies; the Boherawillin Stream (east of the proposed substation), Moneygorm East Stream (EPA code 18M05) within the proposed wind farm site; the Scart 18 Stream (EPA code 18S06) where it crosses under the R671; the Finisk River (EPA code 18F02) where it flows under a road bridge east of 'Modeligo GAA Club'; the Ballykerin Middle Stream (EPA code 18F02) and the River Colligan (EPA code 17C01) east of Ballylemon wood. As detailed above the Finisk River is part of the Blackwater (Munster) catchment.

Table 2-1: Water Body Status (https://www.catchment.ie) within 2km of development

Waterbody Code	Name	Current Status 2016-2021	Development within area	Infrastructure
IE_SW_18G100040	Glennafallia _010	High	Yes	T1, T2
IE_SW_18G110300	Glenshelane_010	Moderate	Yes	T3 to T7
IE_SW_18G100200	Glennafallia_020	Moderate	Yes	Site Entrance
IE_SW_18F020300	Finisk_020	Moderate	Yes	GCR
IE_SW_18F020500	Finisk_030	High	Yes	Substation, borrow pit 2 T14, T15, GCR
IE_SW_18F060300	Farnane _010	High	Yes	Borrow pit 1 T8 – T13, GCR
IE_SW_18M260940	Moneygorm_010	Moderate	Yes	100m of road upgrade, TDR works area
IE_SE_17C010300	Colligan_040	Good	Yes	GCR
IE_SE_16G030200	Glenboy_010	Good	No	NA
IE_SE_16S022200	Suir_160	Good	No	NA
IE_SW_18F020100	Finisk_010	Good	No	NA
IE_SE_16G050100	Glengalla_010	Good	No	NA

A summary of the catchment is included in Table 2-1. The proposed wind farm site is located within the Blackwater (Munster) catchment located within the peatland and forested landscape of Scart Mountain. The naming of the streams varies between the historical maps, OSi maps and the EPA catchment maps.

Table 2-2: WFD Catchment and Subbasin Summary

Catchment	Hydrometric Area	Sub catchment	River Subbasin	Relevant Rivers /streams	Turbines/Substation/ compound in each catchment	WFD status 2016-2021
Blackwater (Munster) Catchment	***HA18***	Blackwater [Munster] SC_140 (18_24)	**Glennafallia_010**	Glennafallia	T1 & T2	High
			Glenshelane_010	Glenshelane	T3, T4,T5,T6,T7	Moderate
			Glennafallia_020	Glennafallia	Proposed site entrance	Moderate
		Finisk_SC_010 (18_15)	**Finisk_010**	Finisk	NA	Good
			Finisk_020	Finisk	GCR	Moderate
			Farnane_010	Farnane	T8,T9,T10,T11,T12,T13, BP2	High
			Finisk_020	Finisk	GCR	Moderate
			Finisk_030	Finisk	T14 and T15, Substation and Grid connection	High

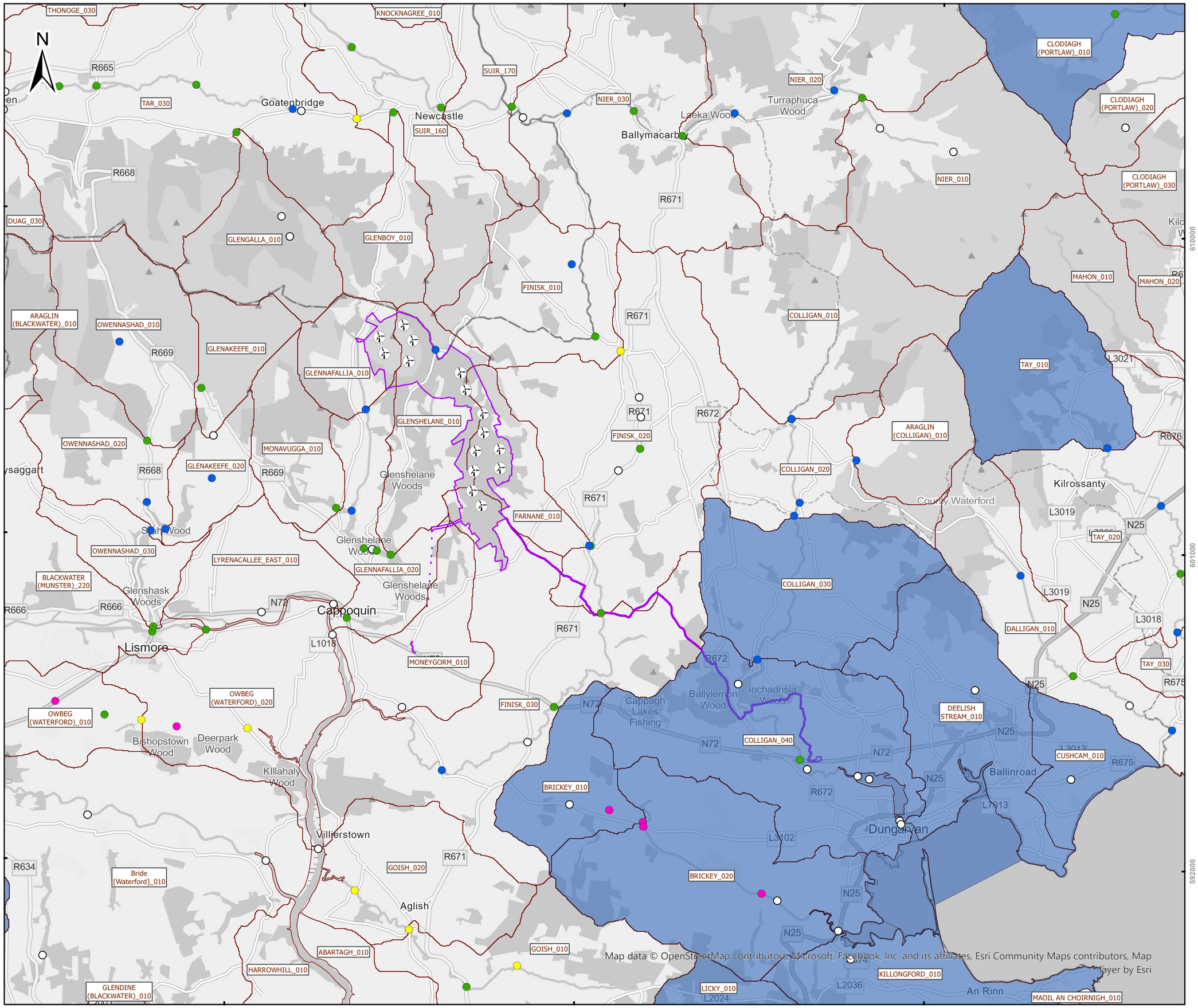
Catchment	Hydrometric Area	Sub catchment	River Subbasin	Relevant Rivers /streams	Turbines/Substation/ compound in each catchment	WFD status 2016-2021
			Moneygorm_010	Moneygorm	Short upgrade of access track, TDR	Good
Colligan Catchment	***HA17***	Colligan_040	**Colligan 040**	Colligan	GCR	High

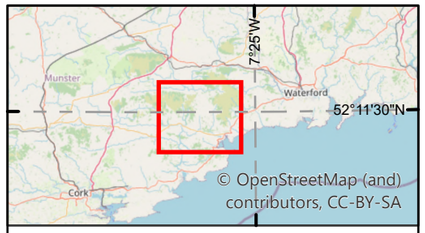
7°52'0"W 7°44'0"W 7°36'0"W

52°15'0"N 52°10'0"N 52°5'0"N

610000 601000 592000

606800 616750 626700





Legend

- Proposed project boundary
- Proposed Turbine layout
- WFD - River SubBasins
- WFD - Areas For Action

Water Quality Monitoring Stations (Q Value)

- No Q value
- Q2-2. Q3 - Poor Status
- Q3-4 - Moderate Status
- Q4 - Good Status
- Q4-5, Q5 - High Status

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Kilometres

NOTES

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Title: Figure 2-2 River Subbasins, Q values and Areas For Action(AFA)

Scale @ A3:	1:100,000	
Prepared by:	Checked by:	Date:
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Map Ref: 11303-106..ApX-S.CAs-SW.Q-TOB-A

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2.1.1.1 Blackwater (Munster) Catchment

The Blackwater (Munster) catchment includes the area drained by the River Blackwater and all streams entering tidal water between East Point and Knockaverry, Youghal, Co. Cork, draining a total area of 3,310km² (EPA, 2022[1]). Rivers within the catchment include the Glenshelane, the Farnane, the Glennafallia, the Finisk and the Moneygorm. The windfarm is located between the R671 and the R669, on the southeastern side of the Knockmealdown Mountains.

Blackwater [Munster]_140 Subcatchment

The Blackwater [Munster]_140 subcatchment includes the upper reaches of the Glennafallia and Glenshelane rivers. A partially afforested hill (Knocknanask Hill) forms the topographic high in this catchment with Turbines T1-5 located in this area. To the southeast, Knocknasheega hill forms a topographic high with Turbines T6 and T7 located within this part of the catchment along adjacent lands. Part of Borrow Pit 1 along with a section of the turbine delivery route (TDR) is also located within this catchment.

Finisk _010 Subcatchment

The Finisk_010 subcatchment is located to the east of the proposed wind farm and comprises the Finisk, Farnane and Moneygorm rivers which all drain to the south before ultimately flowing into the river Blackwater. T8-T15, part of Borrow pit 2, Borrow pit 1 and the proposed substation and grid connection route lie within this subcatchment.

There are no WFD monitoring locations currently recording surface water chemistry within the boundary of Scart Mountain. However, further downstream along the River Blackwater at 'Little Bridge, Cappoquin' in Cappoquin there is a transitional station recording ammonia levels. Annual average concentrations are below the threshold of 'Good status' as defined by the *Surface Water Regulations, 2007 as amended*, which sets a limit of ≤ 0.065 (mean) for ammonium.

There is further water monitoring station at Lismore also recording water chemistry data along the Blackwater River. Water quality at this location is good as highlighted in Figure 2-3.

[1] www.catchment.ie (assessed Sept 2024)

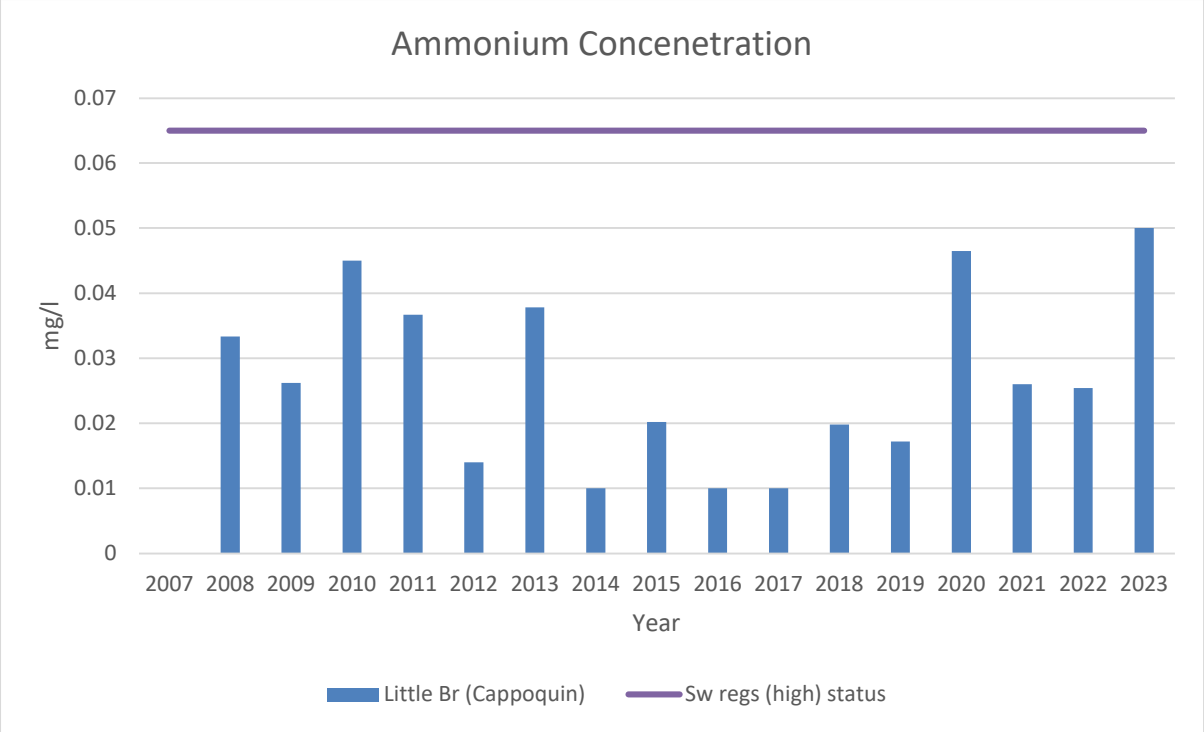

Figure 2-3 WFD monitoring downgradient of the proposed wind farm site

The Colligan is a prioritised area for action (AFA) in River Basin Management Plan (3rd Cycle).

Figure 2-1 depicts Surface Water Features/Local Catchment Delineation in relation to site area which includes a significant number of unnamed streams although EPA reference names have been applied for identification purposes. The proposed GCR is partially located in a delineated area for action Colligan 040 as set out in the National River Basin Management Plan.

Each of the streams flowing through or adjacent to the proposed wind farm has its own sub-catchment area. The delineation of these catchment boundaries, see Figure 2-2.

2.1.2 Groundwater Bodies

The groundwater body (GWB) is the groundwater management unit under the WFD. Groundwater bodies are subdivisions of large geographical areas of aquifers so that they can be effectively managed in order to protect the groundwater and linked surface waters[2]. The GWB is defined as a distinct volume of groundwater, including recharge and discharge areas with little flow across the boundaries. The proposed windfarm is underlain by the Knockmealdown groundwater body (GWB). The groundwater body descriptions are available from the GSI website[3] and the 'status' is obtained from the WFD website[4] and the EPA website[5]. The GWB underlying the proposed wind farm are classified as being at 'Good' status as shown on Table 2-3 The Knockmealdown GWB is comprised of low transmissivity and storativity rocks, described as Poorly Productive bedrock as detailed in Table 2-3.

Table 2-3: Summary of groundwater bodies

EU_CD Code	Name	Description	GWB status (2016-2021)
IE_SW_G_047	Knockmealdown	Poorly productive bedrock	Good

The groundwater in the proposed wind farm is assessed as being of Good quantitative and chemical status. This is expected to continue.

2.1.3 Lake water Bodies

There are no Lake Water bodies within the vicinity of the proposed project.

2.1.4 Transitional and coastal waters

Transitional and coastal waters are not considered by this WFD assessment, having been assessed and scoped out from further assessment by the WFD assessment.

The screening exercise has identified those river waterbodies that are present within a 2 km buffer zone of the proposed wind farm.

2.2 Scoping and assessment results

The WFD requires that activities are also in compliance with other relevant legislation, as considered below. The following are looked at as part of the assessment (as mentioned above, in line with guidance a 2km buffer zone was applied in this assessment):

2.2.1 Protected areas

Nutrient sensitive areas comprise Nitrate Vulnerable Zones and polluted waters designated under the Nitrates Directive (91/676/EEC) and areas designated as sensitive areas under the Urban Wastewater Treatment Directive (UWWTD)(91/271/EEC).

- There are no shellfish waters within 2km of the proposed wind farm;

[2] https://www.gsi.ie/en-ie/programmes-and-projects/groundwater/activities/understanding-ireland-groundwater/Pages/Groundwater-bodies.aspx
[3] www.gsi.ie
[4] www.wfdireland.ie
[5] www.epa.ie

- There are no bathing water sites within 2km of the proposed wind farm ;
- There is one nutrient sensitive site, namely an Urban Wastewater Treatment Directive sensitive area (Site code: IE_SW_020_0500) located 2.7km to the southwest of the proposed wind farm at the Blackwater Estuary Upper.
- There are a number of SPAs and SACs within 2km of the proposed wind farm as outlined in in section 2.2.2 below.

2.2.2 Nature Designations

These are areas previously designated for the protection of habitats or species where maintaining or improving the status of water is important for their protection. They comprise the aquatic part of Natura2000 sites – Special Protection Areas (SPAs) designated under the Birds Directive (79/409/EEC) and Special Areas of Conservation (SACs) designated under the Habitats Directive (92/43/EEC).

Designated sites	Distance from proposed wind farm
Blackwater River (Cork/Waterford) SAC [002170]	The designated site is crossed by the proposed access road. The nearest turbine is located 0.58km east of the proposed wind farm.
Blackwater Estuary SPA [004028]	16.2 km to the south of the southern site boundary however the Blackwater river directly feeds into this SPA.
Dungarvan Harbour SPA [0040302]	3.5 km south-east of the GCR directional drilling site under the Colligan River
Blackwater Callows SPA [004094]	5.2 km south-west of the boundary of the proposed wind farm site.
Blackwater River and Estuary pNHA [000072]	3.3 km southwest of the proposed wind farm site
Dungarvan Harbour pNHA [000663]	3.5 km south-east of the GCR
Glenboy wood pNHA [000952]	1.6 km north of the boundary of the proposed wind farm site
Lower River Suir SAC [002137]	c6.5 km north of the boundary of the proposed project.
Ramsar site: Blackwater Estuary [836] [situated within Blackwater Estuary SPA]	20 km south of the boundary of the proposed wind farm site.
Dungarvan Harbour [839] [situated within Dungarvan Harbour SPA]	4.7 km south-east of the GCR - directional drilling proposed under the Colligan River.

All watercourses connected to the proposed wind farm site ultimately flow into the Blackwater River (Cork/Waterford) SAC. Only construction phase impacts have been identified as being possible in Chapter 9 (Hydrology and Hydrogeology) of this EIAR; these are mitigated through specific measures set out in Chapter 9 (Hydrology and Hydrogeology) of this EIAR, and in the Surface Water Management Plan (SWMP), contained within the Construction Environmental Management Plan (CEMP) in Appendix 3.1 of this EIAR.

Construction, operation and decommissioning activities have been considered in this assessment. The construction phase of the proposed wind farm has the greatest potential to

affect WFD status. Operation of the wind farm should present no significant impacts of any kind on surface waterbodies. Maintenance and repair and decommissioning of the proposed wind farm are identified to present similar types of impacts as construction activities but of a lower order magnitude. Therefore, the worst case scenario is the construction activity on the waterbodies in its vicinity. The assessment is informed by relevant literature, experience from wind farm construction and made using expert judgement. The confidence in the assessment is therefore medium-high (for definitions, see Glossary).

2.2.3 Hydromorphology

This section provides a summary of the known existing hydromorphology risk issues for the fluvial water bodies.

Table 2-4: Hydromorphological Assessment

Assessment Questions	Glennafallia_010	Glenshelane_010	Glennafallia_020	Finisk_010	Finisk_020	Farnanae_010	Fnisk_030	Moneygorm_030
Consider if your activity could impact on the hydromorphology (morphology or water flow of a water body at high status?	RWB at high status	No. RWB not a high status	No RWB not a high status	No RWB not a high status	No RWB not a high status	RWB at high status	RWB at high status	No RWB not a high status
Consider if your activity could significantly impact the hydromorphology of any water body?	No surface water drainage flow and volume will not significantly change	No surface water drainage flow and volume will not significantly change	No surface water drainage flow and volume will not significantly change	No surface water drainage flow and volume will not significantly change	No surface water drainage flow and volume will not significantly change	No surface water drainage flow and volume will not significantly change	No surface water drainage flow and volume will not significantly change	No surface water drainage flow and volume will not significantly change
Consider if your activity is in a water body that is heavily modified for the same use as your activity?	No. not a heavily modified water body.	No. not a heavily modified water body.	No. not a heavily modified water body.	No. not a heavily modified water body.	No. not a heavily modified water body.	No. not a heavily modified water body.	No. not a heavily modified water body.	No. not a heavily modified water body.

3.0 STAGE 3: COMPLIANCE ASSESSMENT

The proposed project has been assessed for its potential to impact each of the WFD quality elements, and as a result have the potential to impact upon the status of the water body or its ability to achieve its objectives in relation to those elements or impact upon Protected Areas.

WFD Compliance Assessment primarily considers the operation of a scheme. However, potential construction impacts are also considered if they have the potential for significant long-term change.

The WFD Compliance Assessment follows the structure of Chapter 9 (hydrology and Hydrogeology) in so far as the three main phases of the proposed project are considered separately in the first instance. The potential for cumulative impacts on a water body as a result of multiple elements of the proposed wind farm potentially impacting upon them is considered in Step 3 of the assessment.

The principal activities that may contribute to effects are:

- Construction works - earthworks, and construction and upgrade of access roads (especially near streams).
- Operational Phase – maintenance works and accidental leaks and spills.
- Decommissioning – similar as during construction, but on a smaller scale.

3.1 Construction Phase

Without mitigation actions, the Proposed wind farm has the potential to affect the water quality and hydromorphology of streams at the Proposed wind farm

The factors that can affect water quality and associated aquatic habitats are associated with:

1. Nutrient release such as nitrogen and phosphorus;
2. Contamination events associated with accidental leaks and spills of fuel or other chemicals;
3. Physical modification to streams including increased flow; and
4. Sedimentation of streams.

A Construction Environmental Management Plan (CEMP) (Appendix 2-8) and Surface Water Management Plan (SWMP) (Appendix 2-10) will be implemented. Impacts in this section are thus the residual impacts identified in Chapter 6 (Biodiversity Flora & Fauna) and Chapter 9 (Hydrology and Hydrogeology) for each quality element of each WFD water body. The measures incorporated into the CEMP and SWMP are embedded mitigation.

3.1.1 Biological Quality Elements

Potential impacts on biological quality elements are assessed in Chapter 6 (Biodiversity Flora & Fauna) of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

Site clearance, excavation activities and stockpiling of material have the potential to result in run off and nutrients, with sediment entering water bodies during construction could stunt macrophyte growth, enhance filamentous algae growth, limit dissolved oxygen capacity and reduce the ecological quality of watercourses ultimately causing increased mortality of fish and other aquatic organisms.

Through the implementation of specific mitigation for clear span crossings no long-term impacts on WFD biological quality elements are foreseen.

Impacts from the drainage are likely to be temporary and localised. Additional inputs of sediment may arise from runoff entry points if this leads to scouring of riverbanks which could also alter natural flow dynamics within the channel should mitigation not be in place. Furthermore, discharges from attenuation ponds could lead to scour of the beds and banks unless outfalls are appropriately designed. Any impacts from discharges will be minimised by managing suspended solid concentrations so they do not exceed 25mg/l and ensuring discharge rates are controlled to limit scour and limit any impacts to species inhabiting the water bodies.

During periods of heavy and/or prolonged rainfall, sediment could enter the water bodies. Once in the receiving water body, channel bed habitats could be impacted due to smothering of bed materials reducing available foraging, nesting and refuge habitats used by fish and macroinvertebrates. In addition, the physiological functioning of fish may be affected due to gill damage caused by suspended solids.

Implementation of the mitigation is set out in Chapter 11, and the use of location specific measures as detailed in Appendix 2.8 CEMP, impacts will be minimised and will not result in deterioration of biological quality elements.

In-channel and riparian habitats could be temporarily impacted from disturbance during construction locally. As all wastewater from welfare facilities will be collected and removed off site, any risk of deteriorating water quality which could impact on biological quality elements will be minimised.

Potential impacts from the construction which may result in a loss of suitable habitat for fish, macroinvertebrates and macrophytes. Potential impacts from the removal of riparian vegetation include the localised loss of riparian habitat and may cause localised bank destabilisation. This could result in the displacement of material which may settle on the channel beds, altering the composition and structure of the substrate used by inhabiting or foraging species. Additional impacts on habitats may arise from the accidental release of oil from machinery which could also alter bed and bank composition.

Chemical and Physico-chemical Quality Elements

Potential impacts on water quality are assessed in Chapter 9 (Hydrology and Hydrogeology) of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

Through implementation of the specific mitigation any impacts will be considered short-term and localised.

3.1.2 Hydromophological Quality elements

Potential impacts on hydromorphology are assessed in Chapter 9 (Hydrology and Hydrogeology) of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

The watercourse crossing technique and use of clean span bridges are used for the construction of the proposed wind farm are not anticipated to have any direct impact on hydromorphology of the water bodies. Through implementation of the mitigation set out in any indirect risk to the hydromorphology of the water bodies will be minimal.

3.1.3 Protected Areas

Potential impacts on Protected Areas are assessed in Chapter 6 (Biodiversity Flora & Fauna) of the EIAR.

Several habitats occur on site. Including 0.086ha of Dry Heath [4030], 0.02ha of Dry Heath [4030] (in mosaic with Bracken HD1), 0.057ha of Dry Heath [4030] and Wet Heath [4010] (mosaic) and 1.93ha of Wet Heath [4010].

The permanent loss of habitat within the proposed wind farm site is evaluated. The construction works will result in significant habitat loss.

Following implementation of mitigation measures outlined in Appendix 2.8 (CEMP), it is not considered likely that there would be deleterious impacts on the qualifying features for the Protected Areas identified.

3.2 Operational Phase

3.2.1 Biological Quality Elements

Potential impacts on biological quality elements are assessed in Chapter 6 (Biodiversity Flora and Fauna) of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

The operation of the proposed wind farm would also result in an impact of negligible concern to the distribution and abundance of suitable foraging habitat. No indirect impacts on habitats or protected species are likely as a result of the proposed wind farm .

3.2.2 Chemical and Physio-chemical Quality Elements

Potential impacts on water quality are assessed in Chapter 9 (Hydrology and Hydrogeology) of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

During the operational phase there would be no process water discharges. Surface water runoff from roads and other impermeable areas will be managed by sustainable drainage system (SuDS). Rainwater will be collected from roof areas and harvested before being re-circulated. Foul wastewater on site will be contained and transported to a licenced Wastewater Treatment Plant (WwTP). No impacts on water bodies are considered likely.

The negligible impacts predicted for in terms of levels and water quality mean that any impacts on inputting water bodies would also be negligible at most.

3.2.3 Hydromorphological Quality elements

Potential impacts on hydromorphology are assessed in Chapter 9 (Hydrology and Hydrogeology) of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

The operation of the proposed wind farm is not considered likely to have any detrimental impact on hydromophological quality elements.

3.2.4 Protected Areas

Based on the proposed design and SuDS measures, the impacts on levels and flows would be indistinguishable from baseline conditions; and would meet the WFD requirements under existing and future climate conditions. As a result, it is not considered likely that the proposed wind farm would result in any deleterious impacts on the qualifying features of these protected areas.

3.2.5 Compliance Assessment Summary

The site-specific impacts of the proposed wind farm on the biological, physico-chemical and hydromorphological quality elements of the water bodies are shown in the assessment above and summarised in Table 3-1.

Table 3-1: WFD: Assessment Summary

Receptor	Potential risk to receptor?	*Note the risk issue(s) for impact assessment*
Hydromorphology	No	No instream works are proposed as part of the proposed wind farm. Surface water drainage flow and volume will be at greenfield runoff rates and will not significantly change as a result of the proposed wind farm.
Biology:	Yes	The Blackwater River (Cork/Waterford) SAC will be crossed by a new bridge between T1 and T5. The Glenshelane and Glennafallia Rivers which flow into the Blackwater River (Cork/Waterford) SAC, the Blackwater River and Estuary pNHA and further downstream into the Blackwater Estuary SPA and Blackwater Estuary Ramsar site. In the southern part of the proposed wind farm site a number of drainage ditches are hydrologically connected to EPA streams flowing into the Farnane and Boherawillin Rivers which flow into the River Finisk which is part of the Blackwater River (Cork/Waterford) SAC. There is also potential for such impacts to occur, including drill lubricant (e.g. bentonite) pollution, at the directional drilling site under the Colligan River which flows into the Dungarvan Harbour SPA, Dungarvan Ramsar site and Dungarvan Harbour pNHA. There are potential direct and indirect impacts on SACs/SPAs and both Annex I Habitats and Non-Annex I habitats.
Water quality	Yes	Short term, the proposed wind farm will not increase sediment and nutrients. Mitigation measures are detailed in the CEMP and SWMP.
Protected areas	*Yes*	The proposed wind farm is located within the Blackwater River (Cork/Waterford) SACs and is hydraulically linked to a number of SPAs. A CEMP and SWMP will be implemented as part of the

Receptor	Potential risk to receptor?	*Note the risk issue(s) for impact assessment*
		proposed wind farm. A clear span bridge will be used to cross the SAC. The operation of the proposed wind farm will not significantly change the current level of surface water or groundwater volume or flow.

3.3 Assessment of Proposed Wind Farm Against Programme of Measures

Within each RBMP, there is a list of measures, or environmental improvements, which have been identified by the RBMP, to meet the target date set by the Water Framework Directive. Part of the WFD compliance assessment is to consider measures and assess whether a proposed wind farm can contribute to them or might obstruct any of them from being delivered. No turf cutting has occurred at the proposed wind farm in recent decades.

4.0 MITIGATION MEASURES

Construction Works will be minimised where practical to reduce exposed ground that could generate silty water runoff, that once in water bodies could alter the natural composition and structure of the substrate especially during periods of prolonged and/or heavy rainfall Implementation of the mitigation set out in Appendix 2.8 (CEMP) will ensure impacts are short-term and localised.

Exposed earth following topsoil stripping could act as a source of sediment following rainfall, which once in the watercourses, could lead to altered substrate composition temporarily. Through implementation of the mitigation set out in Appendix 2.8 (CEMP), Annex B (SWMP), any indirect risk to the hydromorphology of the water bodies will be minimal.

The exposure of peat/soils associated with site preparation has the potential to be a source of fine sediment that could enter water bodies during periods of rainfall. Through implementation of the mitigation set out in Appendix 2.8 (CEMP), any indirect risk to the hydromorphology of the water bodies will be minimal.

Due to the location and nature of construction works and the implementation of the mitigation set out in Appendix 2.8 (CEMP), there will be no detrimental effects on hydromorphological quality elements associated with the construction of the site compound and site preparation activities.

Through implementation of the mitigation set out in Appendix 2.8 (CEMP), any impacts to water bodies would be temporary and localised. Such discharges will discharge at greenfield runoff rates.

Any additional run-off or water from de-watering during construction will be treated (e.g., to remove sediment) within the limits of the proposed wind farm and discharged to local drains/swales.

Runoff from the construction of will be attenuated and treated as appropriate before being allowed to infiltrate or discharge from the proposed wind farm, ensuring that any sediment build-up or pollutants are captured on site rather than released into the wider environment.

Cumulative impacts may also occur between this proposed wind farm and other proposed wind farms. Where waterbodies in the same catchments are crossed by multiple projects, any impacts

may be additive, and the effects may accumulate downstream of the points where the waterbodies are intersected.

Table 4-1: Mitigation Measures matrix

	Turbines	Substation and compounds	Access tracks	Borrow Pits/Spoil deposition	Grid
Utilise existing bridges and access roads			ü		ü
>50m Buffer	ü	ü			
Interceptor drains	ü	ü	ü	ü	
Check Dams or similar	ü	ü	ü	ü	ü
Swales			ü	ü	
Sediment traps					
Level spreaders			ü		
Settlement Ponds	ü	ü		ü	
Proprietary Settlement tanks	ü	ü		ü	
Weather dependant	ü	ü	ü	ü	ü
Silt Fences			ü		
Clear Span Bridge			ü		
Concrete washout and control measures	ü	ü		ü	ü
Chemical/fuel bunds	ü	ü		ü	ü

Taking into consideration the anticipated impacts of the proposed wind farm on the biological, physico-chemical and hydromorphological quality elements, following the implementation of design and mitigation measures, it is concluded that it will not compromise progress towards achieving GES or cause a deterioration of the overall GEP of any of the water bodies that are in scope.

Table 4-2: Compliance of the proposed wind farm with the environmental objectives of the WFD

Environmental Objective	Proposed wind farm	Compliance with the WFD Directive
No changes affecting high status sites.	There are no likely changes in relation to high status in the study area. (high confidence)	Yes
No changes that will cause failure to meet surface water good ecological status or potential or result in a deterioration of surface water ecological status or potential.	After consideration as part of the detailed compliance assessment, the proposed wind farm will not cause deterioration in the status of the water bodies during construction following the implementation of mitigation measures; during	Yes

Environmental Objective	Proposed wind farm	Compliance with the WFD Directive
	operation, no significant impacts are predicted. (high confidence)	
No changes which will permanently prevent or compromise the Environmental Objectives being met in other water bodies.	The proposed wind farm will not cause a permanent exclusion or compromise achieving the WFD objectives in any other bodies of water within the River Basin District. (high confidence)	Yes
No changes that will cause failure to meet good groundwater status or result in a deterioration groundwater status.	The proposed wind farm will not cause deterioration in the status of the groundwater bodies. (high confidence)	Yes

The WFD also requires consideration of how a new scheme might impact on other water bodies and other EU legislation. This is covered in Articles 4.8 and 4.9 of the WFD.

Article 4.8 states: '*a Member State shall ensure that the application does not permanently exclude or compromise the achievement of the objectives of this Directive in other bodies of water within the same river basin district and is consistent with the implementation of other Community environmental legislation*'.

All water bodies within the study area have been assessed for direct impacts. The proposed wind farm will not compromise the achievement of the objectives of the WFD for any water body in the study area. In addition, the proposed wind farm has been assessed for the potential for cumulative impacts with other proposed wind farms within 1km of the study area. Cumulative effects of this project with other developments in the region, relate to the effects on Hydrology. These developments include other existing or planned developments in the environs of Scart Mountain and/or developments with the potential to interface with the proposed project in terms of environmental effects. Key developments in the area include Dyrick Hill Wind Farm.

With the implementation of the mitigation measures it is concluded that in combination with other proposed wind farms the proposed wind farm will not compromise the achievement of the objectives of the WFD for any water body. Therefore, the proposed wind farm complies with Article 4.8.

Article 4.9 of the WFD requires that "Member States shall ensure that the application of the new provisions guarantees at least the same level of protection as the existing Community legislation".

The Habitats Directive (1992) promotes the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats. European designated sites in the vicinity of the proposed wind farm have been assessed and are presented in the Natura Impact Statement (NIS). The NIS is a standalone document included in the planning application for the proposed wind farm. It concludes that the proposed wind farm will not lead to a deterioration in the features of any designated site. The proposed wind farm is not considered to be a risk to designated habitats and therefore is compliant with the Habitats Directive.

The Bathing Water Directive (BWD) (2006/7/EC) was adopted in 2006, and is the process used to measure/monitor water quality at identified bathing waters. There are no bathing waters within 2km of the proposed wind farm .

5.0 CONCLUSIONS

Taking into consideration the impacts of the proposed wind farm on the biological, physico-chemical and hydromophological quality elements, it is concluded that, following the implementation of design and mitigation measures, it will not compromise progress towards achieving GES or cause a deterioration of the overall status of the water bodies that are in scope; it will not compromise the qualifying features of protected areas and is compliant with other relevant Directives. It can therefore be concluded that the proposed wind farm is fully compliant with WFD and therefore does not require assessment under Article 4.7 of the WFD.

6.0 REFERENCES

Defra (2009) WFD Expert Assessment of Flood Management Impacts. Defra, London.

Northern Ireland Environment Agency (2012) Carrying out a Water Framework Directive (WFD) assessment on EIA Developments. NIEA.

UKTAG (2008) UK Environmental Standards and Conditions (Phase 1)

UKTAG (2013) Updated Recommendations on Environmental Standards River Basin Management (2015-21) Final Report. WFD UKTAG.

7.0 GLOSSARY

Term	Definition
Artificial waterbody	A body of surface water created by human activity.
Aquifer	A subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater.
Coastal waterbody	Surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.
Confidence	Low - Non-expert opinion, unsubstantiated opinion with no supporting evidence. Medium - Expert view grounded in theory but based on limited information, e.g., anecdotal evidence, or historical data. High - Estimation of potential impacts or consequences, with strong theoretical basis, using accepted methods, reliable analysis and accepted within the sector as 'fit for purpose'. This typically includes analytical methods where the methods are strong and the science is reliable.
Groundwater	All water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.
Groundwater body	A distinct volume of groundwater within an aquifer or aquifers.
Lake waterbody	A body of standing inland surface water.
Non-Temporary/Temporary	The requirement is to assess if the activities will have an effect that is non-temporary on the status of the waterbody. The terms are not currently defined within the guidance, however, for the purposes of this assessment 'temporary' is assumed to mean recovery should occur within the period of time the element in question is measured. For example, macro-invertebrates should be measured every 3 years. Therefore, temporary means less than three years for this element.
River basin	The area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta.
River Basin District	The area of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters, which is identified under Article 3(1) of the Water Framework Directive as the main unit for management of river basins.
River Basin Management Plan	River Basin Management Plans describe the river basin district, and the pressures that the water environment faces. It shows what this means for the current state of the water environment in the river basin district, and what actions will be taken to address the pressures. It sets out what improvements are possible by 2015 and how the actions will make a difference to the local

	environment - the catchments, estuaries, the coast and groundwater.
River waterbody	A body of inland water flowing on the surface of the land but which may flow underground for part of its course.
Surface water	Inland waters, except groundwater; transitional waters and coastal waters, except in respect of chemical status for which it shall also include territorial waters.
Transitional waterbody	Bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are influenced by freshwater flows.

Appendix A

WFD normative definitions

The WFD provides normative definitions of ecological quality for the purposes of classification of overall ecological status. In surface waterbodies, these are as follows:

High status

There are no, or only very minor, anthropogenic alterations to the values of the physico-chemical and hydromorphological quality elements for the surface waterbody type from those normally associated with that type under undisturbed conditions.

The values of the biological quality elements for the surface waterbody reflect those normally associated with that type under undisturbed conditions, and show no, or only very minor, evidence of distortion.

These are type-specific conditions and communities.

Good status

The values of the biological quality elements for the surface waterbody show low levels of distortion resulting from human activity but deviate only slightly from those normally associated with the surface waterbody type under undisturbed conditions.

Moderate status

The values of the biological quality elements for the surface waterbody type deviate moderately from those normally associated with the surface waterbody type under undisturbed conditions. The values show moderate signs of distortion resulting from human activity and are significantly more disturbed than under conditions of good status.

Poor status

Waters show evidence of major alterations to the values of the biological quality elements for the surface waterbody type and the relevant biological communities deviate from those normally associated with the surface waterbody type under undisturbed conditions.

Bad status

Waters show evidence of severe alterations to the values of the biological quality elements for the surface waterbody type and large portions of the relevant biological communities normally associated with the surface waterbody type under undisturbed conditions are absent.