APPENDIX 9-3

WATER FRAMEWORK DIRECTIVE COMPLIANCE ASSESSMENT REPORT

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MEENBOG WIND FARM, CO. DONEGAL

WATER FRAMEWORK DIRECTIVE ASSESSMENT

FINAL REPORT

Prepared for:

PLANREE LTD

Prepared by:

HYDRO-ENVIRONMENTAL SERVICES

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1. INTRODUCTION

1.1 BACKGROUND

Hydro-Environmental Services (HES) were requested by MKO, on behalf of Planree Ltd, to complete a Water Framework Directive (WFD) Compliance Assessment for the Existing Development.

As described in Section 1.4.1 of this Remedial Environmental Impact Assessment (rEIAR), and to be consistent with the assessment presented in Chapter 9 of this rEIAR, this WFD Compliance Assessment uses the following terminology: the 'Site', the 'Wind Farm Site', the 'Grid Connection', the 'Existing Development', the 'Prospective Development' and the 'Subject Development'.

The purpose of this WFD Compliance Assessment is to determine whether any specific components or activities associated with construction of the Existing Development have compromised WFD objectives or have resulted in a deterioration of the status of any waterbodies in the vicinity or downstream of the Wind Farm Site and Grid Connection Site. This assessment will determine the water bodies with the potential to be impacted, describe the control measures and determine if the Existing Development has been in compliance with the objectives of the WFD since its transposition into Irish Law in 2003.

This WFD Compliance Assessment is intended to supplement the rEIAR submitted as part of the substitute consent application.

1.2 STATEMENT OF AUTHORITY

Hydro-Environmental Services (HES) are a specialist geological, hydrological, hydrogeological and environmental practice that delivers a range of water and environmental management consultancy services to the private and public sectors across Ireland and Northern Ireland. HES was established in 2005, and our office is located in Dungarvan, County Waterford. We routinely complete impact assessments for hydrology and hydrogeology for a large variety of project types including wind farms.

This WFD assessment was prepared by Michael Gill, Conor McGettigan and Nitesh Dalal.

Michael Gill (BA, BAI, Dip Geol., MSc, MIEI) is an Environmental Engineer and Hydrogeologist with over 23 years' environmental consultancy experience in Ireland. Michael has completed numerous geological, hydrological and hydrogeological impact assessments of wind farms and renewable projects in Ireland. For example, Michael has worked on the EIARs for Oweninny WF, Cloncreen WF, and Yellow River WF, and over 120 other wind farm related projects across the country. Michael has also worked on rEIARs for Cleanrath WF, 41 no. Bord na Móna bogs, the Ballivor Bog Group, and also for a number of quarry sites.

Conor McGettigan (BSc, MSc) is an Environmental Scientist with over 5 years' experience in the environmental sector in Ireland. Conor holds an M.Sc. in Applied Environmental Science (2020) from University College Dublin and a B.Sc. in Geology (2016) from University College Dublin. Conor has prepared hydrological and hydrogeological impact assessments for a wide variety of developments on peatlands. Conor also prepared the hydrology and hydrogeology chapters of the rEIARs completed for the substitute consent applications for the peat extraction and ancillary activities at the Ballivor Bog Group and at Lemanaghan Bog.

Nitesh Dalal (B.Tech, PG Dip., MSc) is an Environmental Scientist with over 7 years' experience in environmental consultancy and environmental management in India and over 1 year environmental consultancy experience in Ireland. Nitesh holds a M.Sc. in Environmental Science from University College Dublin (2024), a PG Diploma in Health, Safety and

Environment from Annamalai University, India (2021) and B.Tech. in Environmental Engineering (2016) from Guru Gobind Singh Indraprastha University, India (2016).

1.3 WATER FRAMEWORK DIRECTIVE

The EU Water Framework Directive (2000/60/EC), as amended by Directives 2008/105/EC, 2013/39/EU and 2014/101/EU ("**WFD**"), was established to ensure the protection of the water environment. The Directive was transposed in Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003).

The WFD requires that all member states protect and improve water quality in all waters, with the aim of achieving good status by 2027 at the latest. Any new development must ensure that this fundamental requirement of the WFD is not compromised.

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, and the third cycle covers the period from 2022 to 2027[1]. The RBMPs are forward looking.

The Water Action Plan 2024 is Ireland's 3rd River Basin Management Plan (2022 - 2027). The objectives of the Water Action Plan 2024 have been integrated into the design of the Proposed Development and include:

- Ensure full compliance with relevant EU legislation;
- Prevent deterioration;
- Meet the water standards and objectives for designated protected areas;
- Protect high-status waters; and,
- Implement targeted action and pilot schemes in focus sub-catchments aimed at (i) targeting water bodies close to meeting their objective and (ii) addressing more complex issues that will build knowledge for future cycles.

Our understanding of these objectives is that water bodies, regardless of whether they have 'Poor' or 'High' status, should be treated the same in terms of the level of protection and mitigation measures employed.

[1] *The WFD RBMP cycles are forward looking plans, so 2009-2015 (1st Cycle), 2016-2021 (2nd Cycle), and 2022-2027 (3rd Cycle) are the plans and they use status from the previous 6 years.*
The EPA updates status every three years, but they also complete an additional assessment mid-RBMP cycle. The mid-cycle status does not get reported to the Commission.
The linkage between the two is that the 2nd Cycle plan uses the 2009-2015 status, the 3rd Cycle plan uses the 2016-2021 status. The 2013-2018 status was not used in the RBMP and the 2019-2024 status will not be used in the next RBMP.

2. WATERBODY IDENTIFICATION & CLASSIFICATION

2.1 INTRODUCTION

This section identifies those Surface Waterbodies (SWBs) and Ground Waterbodies (GWBs) with potential to have been affected by the Existing Development and reviews all available WFD information.

2.2 SURFACE WATERBODY IDENTIFICATION

Wind Farm Site

The vast majority of the Wind Farm Site is located in the Foyle River surface water catchment within Hydrometric Area No. 1. This river basin district is an international river basin district with ~3% of this district located in Northern Ireland. Meanwhile, a small area in the northwest of the Wind Farm Site is mapped in the Donegal Bay North regional surface water catchment, with Hydrometric Area No. 37 of the North Western River Basin District.

Within the Foyle River catchment, the Wind Farm Site is located in the Mourne Beg River sub-catchment (MourneBeg_SC_010). The Mourne Beg River, a tributary of the Mourne River, flows to the southeast from Lough Mourne, situated ~2km northeast of the Wind Farm Site entrance. The Mourne Beg River flows to the east, ~150m north of the Wind Farm Site before it crosses into Northern Ireland. Further downstream, this watercourse discharges into the River Derg, ~15km to the east. The River Derg continues to the east. The Mourne River is formed at the meeting of the River Derg and the River Strule, ~27km east of the Wind Farm Site. The Mourne River then flows to the north, through the town of Strabane, before it confluences with the Finn River to form the River Foyle.

In terms of WFD river sub-basins, the Wind Farm Site is located in a total of 5 no. WFD river sub-basins within the Mourne Beg River sub-catchment.

- The northwest of the Wind Farm Site is located in the Mourne Beg_010 WFD river sub-basin. This area is drained by the EPA mapped Croaghonagh Stream, referred to as the Mary Breen's Burn on local OSI mapping. This stream flows to the northeast and discharges into the Mourne Beg River, ~1.8km northeast of the Wind Farm Site. All watercourses in this river sub-basin form part of the Mourne_Beg_010 surface waterbody (SWB).
- A small area in the northeast of the Wind Farm Site is also mapped in the Mourne Beg_010 WFD river sub-basin. Here, the Mourne Beg River is located ~100m north of the Wind Farm Site.
- Much of the Wind Farm Site is located in the Bunadaowen_010 WFD river sub-basin. This area is drained by the Bunadowen River and several of its smaller tributaries. There is a high density of mapped watercourses in this area of the Wind Farm Site, all of which form part of the Bunadawoen_010 SWB.
- A small area in the northeast of the Wind Farm Site is mapped in the Mourne Beg River (Derrygoonan) WFD river sub-basin. This area is drained by the Shruhanagarve Stream which flows to the northeast, before it discharges into the Mourne Beg River. These watercourses form part of the Mourne Beg River (Derrygoonan) SWB.
- The southeast of the Wind Farm Site is located in the Glendergan River WFD river sub-basin. An unnamed tributary of the Glendergan River flows to the south from the area of the Wind Farm Site. The Glendergan River itself forms the southeastern boundary of the Wind Farm Site. This watercourse discharges into the River Derg ~3.7km to the southeast.

Within the Donegal Bay North surface water catchment, the Wind Farm Site is mapped in the Eske River sub-catchment (Eske_SC_010) and the Lowerymore_020 WFD river sub-basin. Within this area, a tributary of the Lowerymore River, referred to by the EPA as the Barrack Hill Stream flows to the southwest in the vicinity of the Wind Farm Site entrance. The Lowerymore River

flows to the southwest, through Barnesmore Gap, before the Lowerymore_010 SWB flows into Lough Eske ~8.7km to the southwest.

Table A Error! Reference source not found. presents the total catchment area of each SWB downstream of the Wind Farm Site. The Bunadaowen_010 SWB has the smallest catchment area (~11km^2). The total catchment area increases significantly downstream reaching ~209km^2 within the Derg River (Millbrook) (upstream of the confluence between the Derg and the Mourne Beg Rivers). Similarly, within the Eske_SC_010 sub-catchment, the Lowerymore_020 SWB has the smallest catchment area of ~23km^2 and increases downstream with the Eske_020 SWB having the upstream catchment area of ~114km^2. Therefore, those waterbodies which are located in close proximity to the Wind Farm Site will have been more susceptible to water quality effects as a result of activities associated with the Wind Farm Site. The potential for the Existing Development to impact the waterbodies decreased further downstream due to the increasing catchment area to the surface waterbody and resulting increase in flow volumes.

Note that the Existing Development did not in any way rely upon the dilution or assimilation capacity of any downstream watercourse. The mitigation measures implemented during the construction of the Existing Development were designed for the protection of the local and downstream SWBs.

Table A: Downstream Catchment Size for River Waterbodies

WFD River Sub-Basin	Total Upstream Catchment Area (km^2)
MourneBeg_SC_010 Sub-Catchment	
Bunadaowen_010	~112
Mournebeg_010	~29
Mourne Beg River (Derrygoonan)	~98
Mourne Beg River (Lisnacloone)	~112
Derg River (Millbrook)	~209
Eske_SC_010 Sub-Catchment	
Lowerymore_020	~23
Lowerymore_030	~31
Eske_010	~90
Eske_020	~114
LeaghanyRiver_SC_010 Sub-Catchment	
Glendergan River	~37

Grid Connection Site

The Grid Connection is predominantly located in the Donegal Bay North catchment and the Eske River sub-catchment (Eske_SC_010). The Grid Connection passes through the Lowerymore_020 and Lowerymore_030 WFD river sub-basins before it connects to the Clogher substation.

Within the Donegal Bay north catchment there are a total of 14 no. watercourse crossings along the Grid Connection over the Lowerymore_020 and Lowerymore_030 SWBs.

Note that these watercourses crossings existed as part of the baseline environment as crossings along the public road network or along existing forestry access tracks within the Wind Farm Site. These crossings are listed in Section 9.3.3. of the rEIAR.

Figure A below presents a local hydrology map of the area and identifies the receiving waterbodies.

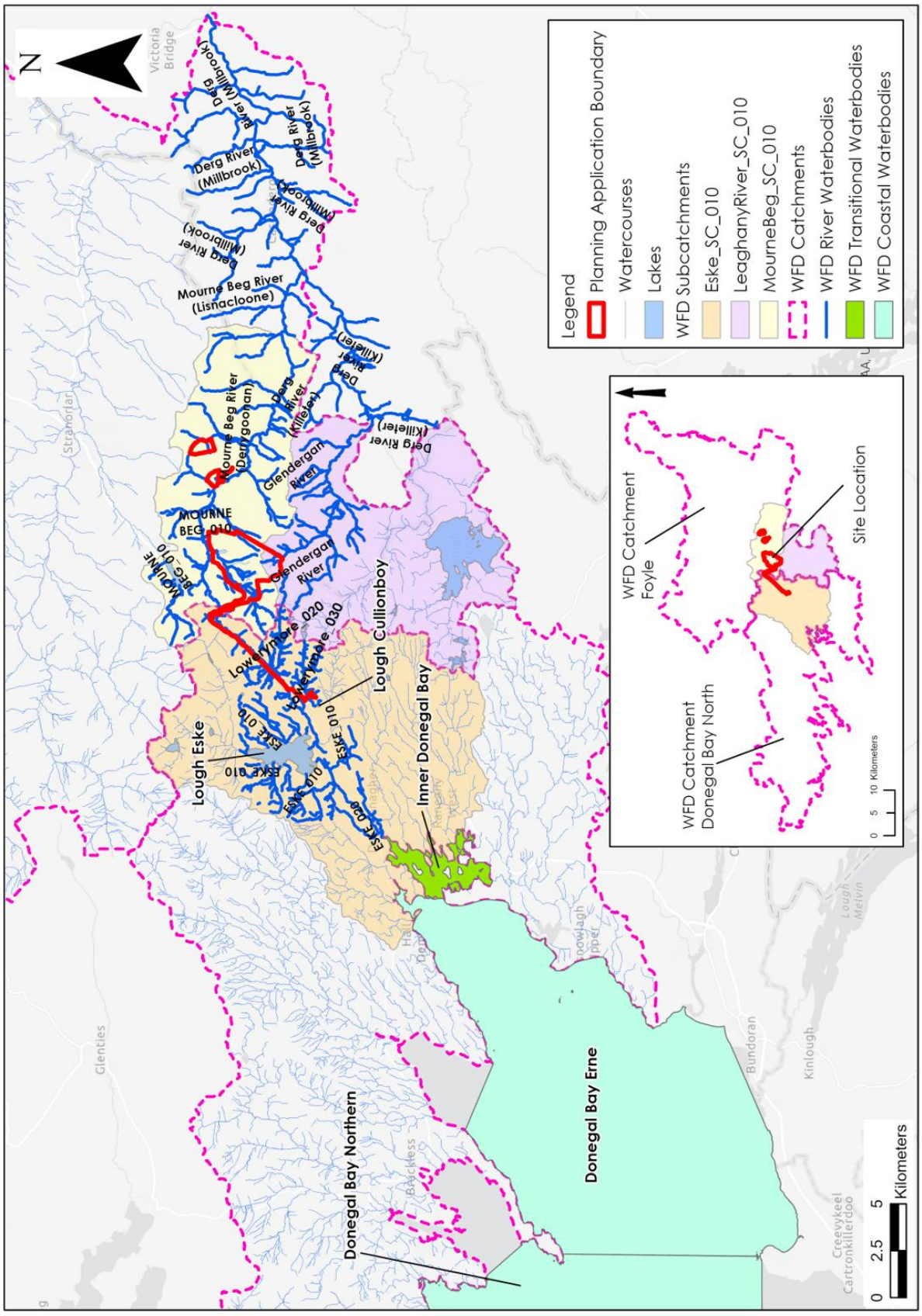

Figure A: Local Hydrology Map

2.3 SURFACE WATER BODY CLASSIFICATION

A summary of the WFD status and risk result for SWBs downstream of the Existing Development are shown in **Table B**. The overall status of SWBs is based on the ecological, chemical and quantitative status of each SWB.

Local Groundwater Body (GWB) and Surface water Body (SWB) status information is available from www.catchments.ie for waterbodies within the Republic of Ireland. The Department of Agriculture, Environment and Rural Affairs (DAERA) online mapping databases was consulted for those waterbodies in Northern Ireland.

Within the Foyle River surface water catchment, the Mourne Beg_010 SWB in the vicinity of the Wind Farm Site achieved 'Poor' status in all 4 no. WFD cycles (2010-2015, 2013-2018, 2016-2021 and
2019-2024). Meanwhile, the status of the Bunadaowen_010 SWB improved from 'Moderate' to 'Good' status in the latest WFD cycle (2019-2024). The east of the Wind Farm Site is drained by the Mourne Beg River (Derrygoonan) SWB which achieved 'Poor' status in the latest WFD cycle. Further downstream the Mourne Beg River (Lisnacloone) is of 'Moderate' status while the Derg River (Milbrook) have 'Poor' status. The status of the Glendergan River has improved from 'Poor' to 'Moderate' in the latest WFD cycle. Meanwhile, the Derg River (Killeter) SWB is of 'Moderate' status.

The majority of the SWBs in the vicinity and downstream of the Existing Development within the Foyle catchment have been deemed to be 'at risk' of failing to meet their respective WFD objectives except for Glendergan River whose risk status is currently "under review".

The 3rd Cycle Foyle Catchment Report (EPA, 2024) states that the significant pressure affecting the greatest number of waterbodies in this catchment is agriculture. The significant pressures impacting the SWBs in the vicinity and downstream of the Wind Farm Site are as follows:

- Agriculture is only listed as a significant pressure on the Derg River (Milford).
- Forestry is a significant pressure on the Mourne Beg_010, Bunadaowen_010 and Mourne Beg River (Derrygoonan) SWBs.
- Abstraction was identified as a significant pressure on the Mourne Beg_010 and Mourne Beg River (Derrygoonan) SWBs.
- Peat drainage and peat extraction (i.e. extractive industry) have been identified as a significant pressure on the Mourne Beg River (Derrygoonan) and the Derg River (Milbrook).
- Unknown anthropogenic pressures are also listed to be impacted several SWBs including the Mourne Beg River (Derrygoonan), Mourne Beg (Lisnacloone) and Derg River (Millbrook) SWBs.

Within the Donegal Bay North surface water catchment, the Lowerymore_020 and _030 SWBs in the vicinity and downstream of the Wind Farm Site and the Grid Connection Site achieved 'High' status in the latest 3 no. WFD cycles. Further downstream, the Eske_010 and Eske_020 SWBs and the Eske lake waterbody are of 'Good' status. The Cullionboy lake SWB in the vicinity of the Grid Connection Site achieved 'High' status in the 2 no. most recent WFD cycles. In terms of transitional waterbodies, the Inner Donegal Bay achieved 'Good' status. In terms of coastal waterbodies, the Donegal Bay Erne and the Donegal Bay Northern SWBs have achieved "High" status. With regard to risk status, the status of the Eske lake waterbody is currently under review while all other SWBs are 'not at risk'. No significant pressures have been identified on these SWBs.

The SWB status for the 2019-2024 WFD cycle are shown on **Figure B.**

Table B: Summary WFD Information for Surface Water Bodies

SWB	Overall Status (2010-2015)	Overall Status (2013-2018)	Overall Status (2016-2021)	Overall Status (2019-2024)	Risk Status	Pressures
Foyle WFD Catchment						
Bunadaowen_010	Poor	Poor	Moderate	Good	At risk	Forestry
Mourne Beg_010	Poor	Poor	Poor	Poor	At risk	Abstraction and Forestry
Mourne Beg River (Derrygoonan)	Moderate	Moderate	Moderate	Poor	At risk	Abstraction, Forestry, Peat & Others
Mourne Beg (Lisnacloone)	Good	Moderate	Moderate	Moderate	At risk	Other
Glendergan River	Moderate	Moderate	Poor	Moderate	Under review	None
Derg River (Killeter)	Good	Good	Good	Moderate	Not at risk	Agriculture, forestry, hydromorphology
Derg River (Millbrook)	Good	Moderate	Moderate	Poor	At risk	Agriculture, Peat & Other
Donegal Bay North WFD Catchment						
Lowerymore_020	High	High	High	High	Not at risk	None
Lowerymore_030	Good	High	High	High	Not at risk	None
Lough Cullionboy	Unassigned	Unassigned	High	High	Not at risk	None
Eske_010	Moderate	Good	Good	Good	Not at risk	None
Lough Eske	Moderate	Good	Good	Good	Under Review	None
Eske_020	Good	Good	Good	Good	Not at risk	None
Inner Donegal Bay	Good	Good	Good	Good	Not at risk	None
Donegal Bay Erne	Unassigned	High	High	High	Not at risk	None
Donegal Bay Northern	Unassigned	High	High	High	Not at risk	None

2.4 GROUNDWATER BODY IDENTIFICATION

Wind Farm Site
Based on the GSI bedrock mapping (www.gsi.ie) the Wind Farm Site is underlain by a total of 3 no. bedrock geological formations.

The majority of the Wind Farm Site is underlain by Lough Eske Psammite Formation comprising of feldspathic psammite, quartzite and marble. The southern section is underlain by the Lough Mourne Formation which is noted to comprise of coarse and feldspathic pale pink psephites in a pale green chloritic matrix. A small area in the west, at the Wind Farm Site entrance, is underlain by the Barnesmore Granite. The bedrock geology mapped underlying the Wind Farm Site is classified as Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones (Pl).

In terms of Groundwater Bodies (GWBs), the vast majority of the Wind Farm Site is underlain by the Castlederg GWB. Meanwhile, a small area in the west of the Wind Farm Site is underlain by the Donegal south GWB. Both GWBs are characterised by poorly productive bedrock.

Grid Connection
As it passes through the Barnesmore Gap the Grid Connection Site is mapped to be underlain by the Barnesmore Granite. Further to the south, the Grid Connection Site is mapped to be underlain by the Lough Mourne Formation which consists of quartz and feldspar pebbles in a green matrix. The bedrock geology mapped underlying the Grid Connection Site is classified as Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones (Pl).

In terms of Groundwater Bodies (GWBs), the vast majority of the Grid Connection is underlain by the Donegal south GWB.

2.5 GROUNDWATER BODY CLASSIFICATION

The Castlederg and Donegal South GWBs, which underlie the Wind Farm Site and Grid Connection Site, achieved 'Good' status in all 4 no. WFD cycles which is defined based on the quantitative status and chemical status of the GWB. These GWBs have been deemed to be 'not at risk' of failing to meet their respective WFD objectives. Furthermore, no significant pressures have been identified on these GWBs.

The GWB status for the 2019-2024 WFD cycles are shown on **Figure B** and summarised in **Table C**.

Table C: Summary WFD Information for Groundwater Bodies

GWB	Overall Status (2010-2015)	Overall Status (2013-2018)	Overall Status (2016-2021)	Overall Status (2019-2024)	Risk Status	Pressures
Castlederg	Good	Good	Good	Good	Not at risk	None
Donegal South	Good	Good	Good	Good	Not at risk	None

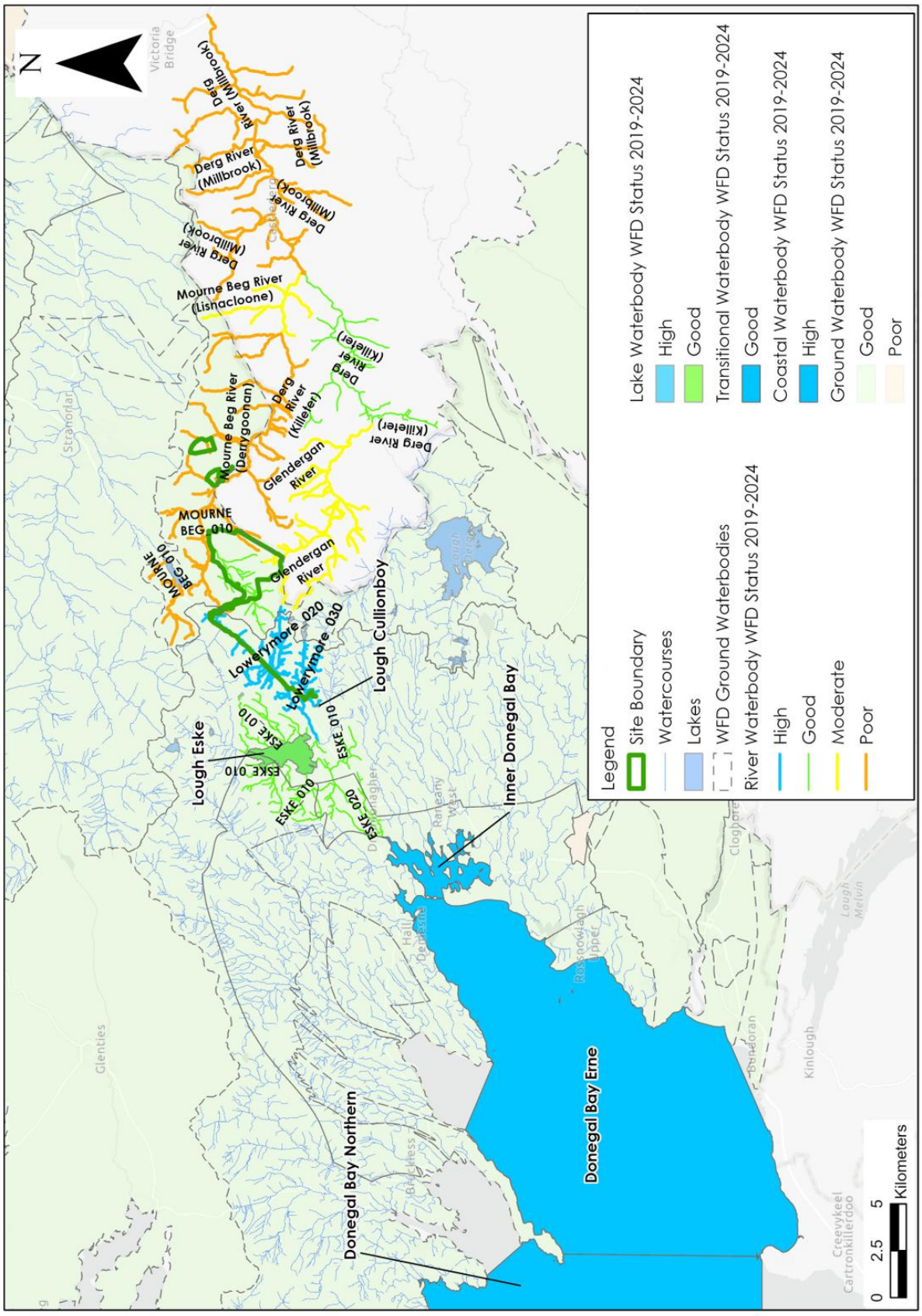

Figure B: WFD Groundwater and Surface Waterbody Status (2019-2024)

2.6 ZONE OF INFLUENCE

The Zone of Influence (ZoI) of the Existing Development extends to the following SWBs in the Republic of Ireland:

- River SWBs – Bunadaowen_010, Mourne Beg_010, Lowerymore_020 and _030 and the Eske_010 and _020;
- Lake Waterbodies – Lough Eske and Lough Cullionboy;
- Transitional and Coastal Waterbodies - Inner Donegal Bay transitional SWB, Donegal Bay Erne and Donegal Bay Northern coastal SWBs.

The ZoI of the Existing Development extends to the following SWBs in Northern Ireland:

- River SWBs - Mourne Beg River (Derrygoonan), Mourne Beg (Lisnacloone), Glendergan River, Derg River (Killeter), Derg River (Millbrook), and the Mourne River.

In terms of GWBs, the ZoI extends to the following:

- Castlederg and Donegal South GWBs

2.7 PROTECTED AREA IDENTIFICATION

The WFD requires that activities are also in compliance with other relevant legislation, as considered below. Nature conservation designations, bathing waters, Nutrient Sensitive Areas (NSA's), shellfish protected areas and Drinking Water Protected Area's (DWPA) within the vicinity of the Wind Farm Site and Grid Connection Site are considered as part of the assessment.

2.7.1 Nature Conservation Designations

Within the Republic of Ireland designated sites include Natural Heritage Areas (NHAs), Proposed Natural Heritage Areas (pNHAs), Special Areas of Conservation (SACs), candidate Special Areas of Conservation (cSAC) and Special Protection Areas (SPAs). Within Northern Ireland designates sites include Special Areas of Conservation (SACs), Areas of Special Scientific Interest (ASSIs), Local Nature Reserves (LNRs) and National Natures Reserves (NNRs).

The Existing Development is not located within any designated conservation site, however, there are designated sites within the Wind Farm Site boundary and in close proximity to some elements of the Existing Development. Small sections of Croaghonagh Bog SAC/pNHA (Site Code: 000129) and Cashelnavean Bog NHA (Site Code: 000122) are located within Wind Farm Site. The Wind Farm Site is also hydrologically connected to some downstream designated sites including the Lough Eske and Ardnamona Wood SAC (Site Code: 000163) along the Lowerymore River and the River Finn SAC along the Mourne Beg River.

The connectivity of all local designated sites to the Wind Farm Site are assessed as follows:

- Croaghonagh Bog SAC/pNHA (Site Code: 000129) is located immediately to the east of the Wind Farm Site entrance road. The SAC/pNHA is located downstream of the Wind Farm Site access road. The SAC/pNHA is located in the catchment of Mary Breen's Burn and is therefore hydrologically connected to other elements of the Existing Development which are drained by this watercourse, although with an increased separation distance.
- Cashelnavean Bog NHA (Site Code: 000122) is located to the west of the Wind Farm Site entrance and to the west of the N15. No direct hydrological connections exist between the Wind Farm Site and this NHA.

- Barnesmore Bog NHA (Site Code: 002375) is located ~400m west of the Wind Farm Site. This NHA is located upstream of the Wind Farm Site. Therefore, there is no potential hydrological and hydrogeological connectivity.
- Lough Eske and Ardnamona Wood SAC/pNHA (Site Code: 000163) are located ~5km southwest of the Wind Farm Site. The Lowerymore River provides a direct hydrological connection between the Wind Farm Site and this SAC.
- The River Finn SAC (Site Code: 002301) is located downstream of the Wind Farm Site along the Mourne Beg River. The works areas associated with the Existing Development at the Wind Farm Site are hydrologically connected to this SAC.

Meanwhile designated sites within Northern Ireland were identified using the Northern Ireland Environment Agency (NIEA) Catchment Map viewer. Designated sites within Northern Ireland and within the ZO include:

- The River Foyle and Tributaries SAC (Site Code: UK0030320) is located downstream of the Wind Farm Site along the Mourne Beg River and the Glendergan River.
- Croagh Bog ASSI (ASSI378) is located downstream of the Wind Farm Site and along the lower reaches of the Shruhangarve Stream.
- The River Foyle and Tributaries ASSI (ASSI229) is located downstream of the Wind Farm Site along the Mourne Beg River and the Glendergan River.
- Killeter Forest Bogs and Lakes ASSI is located ~1km to the south of the Wind Farm Site. The Glendergan River acts as a hydraulic barrier between the Wind Farm Site and this ASSI.

The Grid Connection Site is located immediately to the south of Croaghonagh Bog SAC within the Wind Farm Site. A small section of the N15, including the Grid Connection, overlaps with the mapped extent of the Cashelnavean Bog NHA. The Grid Connection Site runs in close proximity to the Barnesmore Bog NHA which is located topographically upgradient of the Grid Connection. Lough Eske and Ardnamona Wood SAC are located immediately downstream of the Grid Connection Site at Keadew Bridge.

2.7.2 Bathing Waters

Bathing waters are those designated under the Bathing Water Directive (76/160/EEC) or the later revised Bathing Water Directive (2006/7/EC).

There are no bathing waters immediately downstream of the Wind Farm Site or the Grid Connection. The closest bathing waters mapped is at Murvagh Beach (IENWBWC010_0000_0100) located ~13km southwest of southern section of the Grid Connection Site. These designated bathing waters are associated with the Donegal Bay (Erne) coastal waterbody.

2.7.3 Nutrient Sensitive Areas

Nutrient Sensitive Areas (NSA) 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). Sensitive areas under the UWWTD are water bodies affected by eutrophication associated with elevated nitrate concentrations and act as an indication that action is required to prevent further pollution caused by nutrients.

There are no NSAs in the vicinity or downstream of the Existing Development. The nearest NSA is Killybegs Harbour (IE_NW_085_0000) which is located ~28km southwest of southern section of the Grid Connection. This NSA is associated with the Donegal Bay (Erne) coastal waterbody.

2.7.4 Shellfish Waters

The Shellfish Waters Directive (2006/113/EC) aims to protect or improve shellfish waters in order to support shellfish life and growth.

There are no designated shellfish protected waters within the vicinity of the Wind Farm Site and Grid Connection Site. The closest designated shellfish area downstream is in Donegal Bay (IE_NW_050_0100) located ~13km southwest of the Grid Connection. These designated shellfish waters are associated with the Inner Donegal Bay transitional SWB.

2.7.5 Salmonid Waters

There is no designated salmonid waters mapped in the vicinity or downstream of the Existing Development.

2.7.6 Drinking Water

There are no mapped Drinking Water Protected Areas (DWPA) within or immediately downstream of the Wind Farm Site and Grid Connection Site. The closest DWPA is the Lough Mourne DWPA located upstream of the Wind Farm Site. However, Uisce Éireann abstract water from the Bunadaowen River within the Wind Farm Site and pump it to Lough Mourne Reservoir, ~1.7km to the north. This abstraction is currently not mapped on the online WFD database (www.catchments.ie).

The Lough Cullionboy DWPA is also mapped in the vicinity of the Grid Connection Site, located ~400m to the southwest of Clogher 110kV Substation.

In the Donegal Bay North Catchment, the Eske_020 SWB upstream of Donegal Town and downstream of Lough Eske is identified as a DWPA.

Within Northern Ireland the Derg/Strule catchment is identified as a DWPA.

Meanwhile, all the GWBs in Ireland are listed as DWPA.

3. WFD SCREENING

3.1 SURFACE WATER BODIES

With consideration for the construction activities associated with the Existing Development, it is considered that the Mourne Beg_010, Bunadaowen_010, Mourne Beg River (Derrygoonan), Glendergan River, Lowerymore_020 and Lowerymore_030 SWBs are carried through into the WFD Compliance Assessment due to the location of Existing Development within these respective WFD river sub-basins. Furthermore, the Mourne Beg River (Lisnacloone), the Eske_010, the Derg River (Killeter) and the Derg River (Milbrook) SWBs will be included in the assessment due to their location directly downstream of the Mourne Beg River (Derrygoonan), the Lowerymore_030 and the Glendergan River SWBs respectively. The Cullionboy lake waterbody is also included in the WFD Compliance Assessment due to its close proximity to the Grid Connection Site. The Existing Development must not in any way have resulted in a deterioration in the status of these SWBS and/or prevent this SWB from meeting the biological and chemical characteristics for good status in the future.

The River Mourne and Eske_020 SWBs have been screened out of the WFD Compliance Assessment due to the increasing flow volumes within these SWBs and their distant location from the Existing Development. Note that the River Mourne SWB is located downstream of the confluence between the Rive Derg and the Strule River. This increase in flow volumes would provide a significant dilution effect and there would have been no potential for significant effects on this SWB. Similarly, the Eske_020 SWB is distant from the Wind Farm Site and Grid Connection Site and downstream of Lough Eske, which acts as a hydrological buffer between the Wind Farm Site and Grid Connection Site and downstream SWBs. The construction of the Existing Development had no potential to cause a deterioration in the status of these screened out SWBs and/or jeopardise their attainment of good surface water status.

The Lough Eske lake SWB has been screened out due to the large volumes of water within this waterbody. Additionally, the Inner Donegal Bay transitional waterbody, and the Donegal Bay Erne and Donegal Bay Northern coastal waterbodies have also been screened out due their distant location from the Wind Farm Site and Grid Connection Site, large volumes of water within these SWBs. The construction of the Existing Development construction activities had no potential, and will have no potential, to cause a deterioration in the status of these screened out SWBs and/or jeopardise their attainment of good surface water status in the future.

Note that the Existing Development did not in any way rely upon the dilution, assimilation or buffering capacity of any downstream waterbody. The mitigation measures implemented during the construction of the Existing Development were designed for the protection of all watercourses, including those immediately adjacent to the Wind Farm Site and Grid Connection Site.

3.2 GROUNDWATER BODIES

With respect to GWBs, the Castlederg and Donegal South GWBs have been screened in due to their location directly underlying the Wind Farm Site and the Grid Connection Site. The construction of the Existing Development must not in any way have resulted in a deterioration in the status of these GWBs and/or prevented them from meeting the biological and chemical characteristics for good status in the future.

3.3 PROTECTED AREAS

Croaghonagh Bog SAC/pNHA: A small section to the west within the Wind Farm Site and the Grid Connection are located within the Croaghonagh Bog SAC/pNHA. This SAC/pNHA is hydrologically connected to Existing Development. With consideration for the construction

activities associated with the Existing Development, it is considered that the Croaghonagh Bog SAC/pNHA is carried through into the WFD Compliance Assessment.

Cashelnavean Bog NHA: A small section of the Grid Connection Site along the N15 overlaps with the Cashelnavean Bog NHA. With consideration for the construction activities associated with the Existing Development, it is considered that the Cashelnavean Bog NHA is carried through into the WFD Compliance Assessment.

Lough Eske and Ardnamona Wood SAC/pNHA: The Lough Eske and Ardnamona Wood SAC/pNHA is located downstream of the Wind Farm Site. The SAC/pNHA is also located immediately downstream of the Grid Connection at Keadew Bridge. This SAC/pNHA is therefore hydrologically connected to the Existing Development. With consideration for the construction activities associated with the Existing Development, it is considered that the Lough Eske and Ardnamona SAC/pNHA is carried through into the WFD Compliance Assessment.

River Finn SAC: The River Finn SAC lies downstream of the Wind Farm Site along the Mourne Beg River within the Mourne Beg (Derrygoonan) WFD river sub-basin and is hydrologically connected with the Existing Development. With consideration for the construction activities associated with the Existing Development, it is considered that the River Finn SAC is carried through into the WFD Compliance Assessment.

Barnesmore Bog NHA: The Barnesmore Bog NHA is mapped within the Lowerymore_020 and Lowerymore_030 WFD river sub-basins. However, the NHA is located upstream/upgradient of the Exiting Development. Therefore, there is no potential hydrological and hydrogeological connectivity. Therefore, the Barnesmore Bog NHA has been screened out of the WFD Compliance Assessment.

River Foyle and Tributaries SAC: The River Foyle and Tributaries SAC is located downstream of the Wind Farm Site along the Mourne Beg and Glendergan rivers and is hydrologically connected with the Existing Development. With consideration for the construction activities associated with the Existing Development, it is considered that the River Foyle and Tributaries SAC is carried through into the WFD Compliance Assessment

Croagh Bog ASSI: The Croagh Bog ASSI is located downstream of the Wind Farm Site and along the lower reaches of the Shruhangarve Stream. The ASSI is hydrologically connected with the Existing Development. With consideration for the construction activities associated with the Existing Development, it is considered that the Croagh Bog ASSI is carried through into the WFD Compliance Assessment.

River Foyle and Tributaries ASSI: The River Foyle and Tributaries ASSI is located downstream of the Wind Farm Site along the Mourne Beg River and the Glendergan River and is hydrologically connected with the Existing Development. With consideration for the construction activities associated with the Existing Development, it is considered that the River Foyle and Tributaries ASSI is carried through into the WFD Compliance Assessment.

Killeter Forest Bogs and Lakes ASSI: Killeter Forest Bogs and Lakes ASSI is located to the south of the Wind Farm Site. The Glendergan River acts as a hydraulic barrier between the Wind Farm Site and this ASSI. Therefore, there is no hydrological and hydrogeological connectivity. This ASSI has been screened out of the WFD Compliance Assessment.

Murvagh Bathing Waters: The Murvagh bathing waters have been screened out of the WFD Compliance Assessment due to their distant location from the Wind Farm Site and Grid Connection Site and large volumes of water within the associated coastal SWB. The Existing Development had no potential to impact on the status of these bathing waters.

Killybegs Harbour NSA: The Killybegs Harbour NSA has been screened out of the WFD Compliance Assessment due to its distant location from the Wind Farm Site and Grid

Connection Site and large volumes of water within the associated coastal SWB. The Existing Development had no potential impact on the status of this NSA.

Donegal Bay Shellfish Waters: The Donegal Bay designated shellfish waters have been screened out of the WFD Compliance Assessment due to their distant location from the Wind Farm Site and Grid Connection Site and the large volumes of water within the associated transitional SWB. The Existing Development had no potential to impact on the status of these protected shellfish waters.

Lough Mourne DWPA: Lough Mourne is carried through into the WFD Compliance Assessment due to its close proximity to the Existing Development.

Lough Cullionboy DWPA: The Lough Cullionboy DWPA is mapped in close proximity to the Grid Connection and is included in the WFD Compliance Assessment.

Eske_020 DWPA: The Eske_020 DWPA has been screened out due to distant location from the Wind Farm Site and Grid Connection Site (downstream of Lough Eske) and the large volumes of water with the lake waterbody which acts as a hydrological buffer. The Existing Development had no potential to impact on the status of this DWPA.

3.4 WFD SCREENING SUMMARY

A summary of WFD Screening discussed above is shown in **Table D**.

Table D: Screening of WFD water bodies located within the study area

Type	WFD Classification	Waterbody Name/ID	Inclusion in Assessment	Justification
Surface Water Body	**Foyle WFD Catchment**			
	River	Bunadaowen_010	**Yes**	The Wind Farm Site is located in the Bunadaowen_010 WFD river sub-basin. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this SWB. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this SWB.
	River	Mourne Beg_010	**Yes**	The Wind Farm Site and small section of the Grid Connection is located in the Mourne Beg_010 WFD river sub-basin. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this SWB. Similarly, an assessment is required to consider the potential effects of the post-construction phases on this SWB.
	River	Mourne Beg River (Derrygoonan)	**Yes**	The eastern section of the Wind Farm Site is located in the Mourne Beg River (Derrygoonan) WFD river sub-basin. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this SWB. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this SWB.
	River	Mourne Beg (Lisnacloone)	**Yes**	The Mourne Beg (Lisnacloone) is located directly downstream of the Mourne Beg River (Derrygoonan). Therefore, an assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this SWB. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this SWB.
	River	Derg River (Millbrook)	**Yes**	The Derg River (Millbrook) is located downstream of the confluence of the Mourne Beg and Derg rivers. Due to the large flow volumes in this SWB, and its distant location from the Wind Farm Site and Grid Connection Site, it will not be included into the WFD Compliance Assessment as the potential for effects associated with the Existing Development are negligible.
	River	Mourne River	No	The Mourne River is located downstream of the confluence of the Derg and Strule rivers. Due to the large flow volumes in this SWB, and its distant location from the Wind Farm Site and Grid Connection Site, it will not be included into the WFD Compliance Assessment as the potential for effects associated with the Existing Development are negligible.
	River	Glendergan River	**Yes**	The southeastern section of the Wind Farm Site is located in the Glendergan River WFD river sub-basin. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this SWB. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this SWB.
	Donegal Bay North WFD Catchment			

	River	Lowerymore_020	**Yes**	The Grid Connection is located in the Lowerymore_020 WFD river sub-basin. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this SWB. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this SWB.
	River	Lowerymore_030	**Yes**	The Grid Connection is located in the Lowerymore_030 WFD river sub-basin. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this SWB. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this SWB.
	Lake	Lough Cullionboy	**Yes**	Lough Cullionboy SWB is included in the assessment for the purposes of a conservative assessment due to its location in close proximity to the Grid Connection.
	River	Eske_010	**Yes**	The Eske_010 SWB is located directly downstream of the Lowerymore_030 SWB and is hydrologically connected to the Grid Connection. Due to its proximal location to the Wind Farm Site and Grid Connection Site, an assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this SWB. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this SWB.
	Lake	Lough Eske	No	Lough Eske will not be included in the WFD Compliance Assessment due to the large volumes of water within this lake body.
	River	Eske_020	No	The Eske_020 SWB will not be included in the WFD Compliance Assessment as Lough Eske acts as a hydrological buffer between the Wind Farm Site and Grid Connection Site and this SWB.
	Transitional	Inner Donegal Bay	No	The Inner Donegal Bay transitional waterbody will not be included in the WFD Compliance Assessment as there is no potential for SWB quality deterioration due to the large amount of water within this SWB and its distant location from the Wind Farm Site and Grid Connection Site.
	Coastal	Donegal Bay Erne	No	The Donegal Bay Erne coastal waterbody will not be included in the WFD Compliance Assessment due to the large amount of water within this SWB and its distant location from the Wind Farm Site and Grid Connection Site.
	Coastal	Donegal Bay Northern	No	The Donegal Bay Northern coastal waterbody will not be included in the WFD Compliance Assessment due to the large amount of water within this SWB and its distant location from the Wind Farm Site and Grid Connection Site.
Groundwater Body	Groundwater	Castlederg GWB	**Yes**	The majority of the Wind Farm Site and some sections of the Grid Connection are underlain by the Castlederg GWB. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this GWB. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this GWB.
	Groundwater	Donegal South GWB	**Yes**	The majority of the Grid Connection and some sections of the Wind Farm Site are underlain by the Donegal South GWB. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this GWB. Similarly, an assessment is required to consider the potential effects of the post-construction

				phase on this GWB.
Protected Areas	SAC and pNHA	Croaghonagh Bog SAC and pNHA	**Yes**	A small section to the west within the Wind Farm Site and the Grid Connection are located within the Croaghonagh Bog SAC and pNHA. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this SAC and pNHA. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this SAC and pNHA.
	NHA	Cashelnavean Bog NHA	**Yes**	A small section to the Grid Connection is located within the Cashelnavean Bog NHA. This NHA is hydrologically connected to Grid Connection. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this NHA. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this NHA.
	SAC and pNHA	Lough Eske and Ardnamona Wood SAC and pNHA	**Yes**	The Lough Eske and Ardnamona Wood SAC is located downstream of the Wind Farm Site and directly downstream of the Grid Connection. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this SAC and pNHA. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this SAC and pNHA.
	SAC	River Finn SAC	**Yes**	The River Finn SAC lies downstream of the Wind Farm Site along the Mourne Beg River within the Mourne Beg (Derrygoonan) sub-basin. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this SAC. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this SAC.
	NSA	Barnesmore Bog NHA	No	The Barnesmore Bog NHA is mapped within the Lowerymore_020 and Lowerymore_030 river sub-basins but it is located upstream/upgradient of the Grid Connection. Therefore, this NHA will not be included into the WFD Compliance Assessment.
	SAC	River Foyle and Tributaries SAC	**Yes**	The River Foyle and Tributaries SAC is located downstream of the Wind Farm Site along the Mourne Beg River and the Glendergan River. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this SAC. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this SAC.
	ASSI	Croagh Bog ASSI	**Yes**	The Croagh Bog ASSI is located downstream of the Wind Farm Site and along the lower reaches of the Shruhangarve Stream. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this ASSI. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this ASSI.
	ASSI	River Foyle and Tributaries ASSI	**Yes**	The River Foyle and Tributaries ASSI is located downstream of the Wind Farm Site along the Mourne Beg River and the Glendergan River. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this ASSI. Similarly, an assessment is required to consider the potential effects of

				the post-construction phase on this ASSI.
	ASSI	Killeter Forest Bogs and Lakes ASSI	No	Killeter Forest Bogs and Lakes ASSI is located to the south of the Wind Farm Site. The Glendergan River acts as a hydraulic barrier between the Wind Farm Site and this ASSI. Therefore, this ASSI will not be included into the WFD Compliance Assessment.
	Bathing Waters	Murvagh	No	The Murvagh bathing waters has been screened out due to distant location and large volume of water within the associated SWB. Therefore, this bathing waters will not be included into the WFD Compliance Assessment.
	NSA	Killybegs Harbour	No	The Killybegs Harbour NSA has been screened out due to the distance between this NSA and Existing Development.
	Shellfish Waters	Donegal Bay	No	The Donegal Bay shellfish waters have been screened out due to its distant location from the Wind Farm Site and Grid Connection Site and the large volume of water within the associated SWB. Therefore, these shellfish waters will not be included in the WFD Compliance Assessment.
	Drinking Water	Lough Mourne	**Yes**	While Lough Mourne Reservoir is located upstream of the Wind Farm Site and Grid Connection Site, the reservoir is partly sourced from the Bunadaowen River within the Wind Farm Site. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this DWPA. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this DWPA.
		Lough Cullionboy	**Yes**	The Lough Cullionboy DWPA is mapped in close proximity to the Grid Connection. An assessment is required to consider the potential effects that the construction activities associated with the Existing Development have had on this DWPA. Similarly, an assessment is required to consider the potential effects of the post-construction phase on this DWPA.
		Eske_020	No	The Eske_020 DWPA has been screened out due to distant location from the Wind Farm Site and Grid Connection Site and large volumes of water within Lough Eske which acts as a hydrological buffer. Therefore, this DWPA will not be included in the WFD Compliance Assessment.

4. WFD COMPLIANCE ASSESSMENT

4.1 CHARACTERISTICS OF THE EXISTING DEVELOPMENT

The Existing Development is described in full in Chapter 4 of this rEIAR.

In summary the Existing Development consists of the following:

- Upgrading of access junctions, tracks and roads, and construction of new site access roads;
- 18 no. wind turbine foundations and hardstand areas at various stages of development;
- A 110kV Electrical substation with 2 no. control buildings with welfare facilities, associated electrical plant and apparatus, security fencing and underground wastewater holding tank;
- 110kV underground grid connection cabling (including joint bays, communication chambers, earth sheath links, and ancillary works along the underground electrical cabling route) connecting the wind farm 110kV substation to the Clogher Substation in the townland of Cullionboy. This cabling route is primarily located within the public road corridor;
- Internal wind farm underground cabling at various stages of development;
- 2no. temporary construction compounds;
- 3no. borrow pits;
- Peat and spoil management;
- Forestry felling;
- Site drainage and sediment control measures; and
- All associated site development works.

Construction of the Existing Development commenced in November 2019. The majority (>90%) of construction activity associated with construction of windfarm infrastructure took place during a 12-month period from November 2019 to November 2020, with works along the Grid Connection continuing until early 2021. Some construction works recommenced in Q3 of 2022 for a period of 6 weeks.

All works were completed in accordance with the 2019 CEMP for the Meenbog Wind Farm. The 2019 CEMP also detailed emergency response procedures to be followed in the event of a peat slide and these measures were implemented following the November 2020 Peatslide.

Ongoing activities associated with the Existing Development are limited to periodic maintenance of the substation, site tracks, and sediment and erosion control measures as well as environmental monitoring. The Existing Development has been confirmed as stable, from an environmental perspective and safe from a Health and Safety perspective.

4.2 MITIGATION MEASURES

4.2.1.1 Mitigation for the Protection of Surface Water Quality During Construction Earthworks

Mitigation by Avoidance

The key mitigation measure implemented during the construction phase was the avoidance of sensitive hydrological features where possible, by application of suitable buffer zones (i.e. 50m to main watercourses).

The majority of the Existing Development is located outside of the delineated 50m natural watercourse (river and stream) buffer zones. Silt fences were installed as an additional water

protection measures around existing watercourses in certain locations, particularly where works occurred within the hydrological buffer zone. The silt fences were installed as single, double or triple silt fences depending on the space available and the anticipated loading. Further details on silt fences are included in the 2019 CEMP.

The large setback distance from sensitive hydrological features meant that adequate room was maintained for the drainage mitigation measures (discussed below) to be properly installed and operate effectively. The buffer zone:

- Avoided physical damage (river/stream banks and river/stream beds) to watercourses and associated release of sediment;
- Avoided excavations within close proximity to surface watercourses;
- Avoided the entry of suspended sediment from earthworks into watercourses; and,
- Avoided the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.

Mitigation by Design

The following controls and treatment systems were implemented during the construction phase:

- Source controls:
    - Interceptor drains, erosion and velocity control measures such as use of sand bags and other similar/equivalent or appropriate systems.
    - Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas or other similar/equivalent or appropriate measures.
- In-Line controls:
    - Interceptor drains, oversized swales, erosion and velocity control measures such as check dams, silt bags, silt fences, sedimats, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems.
- Treatment systems:
    - Temporary sumps and ponds, temporary storage lagoons, sediment traps, and settlement ponds.

It should be noted for the Wind Farm Site that an extensive network of forestry and roadside drains already existed, and these were integrated and enhanced as required and used within the Wind Farm Site drainage system. The integration of the existing forestry drainage network and the Wind Farm Site drainage network was relatively simple. The key elements were the upgraded and improvements to water treatment elements, such as in line controls and treatment systems, including silt traps and settlement ponds.

The main elements of interaction with the pre-existing drainage were as follows:

- Drains were constructed around the footprint of the Existing Development and conveyed clean runoff water to the downstream drainage systems, there was no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the wind farm drainage system into the pre-existing site drainage network. This reduced the potential for any increased risk of downstream flooding or sediment transport/erosion;
- Silt traps were placed in the pre-existing drains where appropriate;
- Silt fences were placed downstream of the works areas where appropriate;
- Runoff from individual work areas was not discharged into the pre-existing drain network but discharged locally at each work location through settlement ponds;
- Drains running parallel to the pre-existing roads which were upgraded and were targeted to the opposite side of the road. Velocity and silt control measures such as

silt fences were used during the construction works. Regular buffered outfalls were also added to drains to protect downstream surface waters.

Pre-emptive Site Drainage Management
The works programme for the construction phase of the Existing Development considered weather forecasts, and predicted rainfall in particular. Large excavations and movements of soil/subsoil or vegetation stripping were suspended or scaled back when heavy rain was forecast. The extent to which works were scaled back or suspended related directly to the amount of rainfall forecast.

Timing of Site Construction Works
Construction of the site drainage system was only carried out during periods of low rainfall, therefore, minimising runoff rates. This reduced the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. Construction of the drainage system during this period also ensure that attenuation features associated with the drainage system were in place and operational for all subsequent construction works.

Monitoring
An inspection and maintenance plan for the on-site drainage system was prepared in advance of commencement of any works. Regular inspections of all installed drainage systems were undertaken, especially after heavy rainfall, to check for blockages, and ensure there was no build-up of standing water in parts of the systems where it is not intended. Inspections were also completed after tree felling. The inspections were completed by the ECoW and Project Hydrologist.

Any excess build-up of silt levels at dams, the settlement pond, or any other drainage features that may decrease the effectiveness of the drainage feature, was removed.

During the construction phase field testing and laboratory analysis of a range of parameters with relevant regulatory limits and EQSs was undertaken for each primary watercourse, and specifically following heavy rainfall events (i.e. weekly, monthly and event based).

The detailed surface water quality monitoring plan for the construction phase was set out in the CEMP.

4.2.1.2 Mitigation for the Protection of Surface Water Quality from Tree Felling

The mitigation measures were as follows:

- Machine combinations were chosen which were most suitable for the ground conditions at the time of felling and to minimise soils disturbance;
- Use of buffer zones for aquatic zones as per the Forest service (2000) guidance;
- Roads and culverts were checked and maintained during felling operations;
- No tracking of vehicles through watercourses occurred;
- Where possible, existing drains were not disturbed during felling works;
- Ditches which drain from the felling area towards existing surface watercourses were blocked, and temporary silt traps were constructed. No direct discharge of such ditches to watercourses occurred during felling. Drains and sediment traps were installed during ground preparation works. Collector drains were excavated at an acute angle to the contour (~0.3%-3% gradient), to minimise flow velocities. Main drains from collector drains included water drops and rock armour, as required, where there were steep gradients, and were not placed at right angles to the contour;
- Sediment traps were sited outside of buffer zones and had no direct outflow into the aquatic zone. Machine access was maintained to enable the accumulated sediment to be excavated. Sediment was carefully disposed of away from all aquatic zones. Where possible, all new silt traps were constructed on even ground and not on sloping ground;

- In areas, particularly sensitive to erosion, it was necessary to install double or triple sediment traps. This measure was reviewed on site during construction works;
- All drainage channels tapered out before entering the aquatic buffer zone. This ensured that discharged water gently fanned out over the buffer zone before entering the aquatic zone, with sediment filtered out from the flow by ground vegetation within the zone. On erodible soils, silt traps were installed at the end of the drainage channels, to the outside of the buffer zone;
- Drains and silt traps were maintained throughout all felling works, ensuring that they were clear of sediment build-up and are not severely eroded. Correct drain alignment, spacing and depth ensured that erosion and sediment build-up were minimised and controlled;
- Brash mats were used to support vehicles on soft ground, reducing peat and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding could occur. Brash mat renewal took place when they became heavily used and worn. Provision was made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there was a risk of severe erosion occurring, extraction was suspended during periods of high rainfall;
- Timber was stacked in dry areas, and outside a local 50m stream buffer zone. Check dams were emplaced on the down gradient side of timber storage/processing sites;
- Works were carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water run-off;
- Refuelling or maintenance of machinery was not permitted within 50m of an aquatic zone. Dedicated refuelling areas were used during the felling works; and,
- Branches, logs or debris were not allowed to build up in aquatic zones. All such material was removed when harvesting operations were completed, but care was taken to avoid removing natural debris deflectors.

4.2.1.3 Mitigation for the Protection of Surface Water Quality During Peat and Spoil Management

All peat was managed in accordance with the environmental management measures set out in the 2019 CEMP for the Permitted Development.

Excavated peat was side-cast throughout the Wind Farm Site and any excess peat was used to backfill the onsite borrow pits or contained within engineered peat cells.

- During the initial placement of peat and subsoil were used to control surface water runoff from the peat and spoil management areas.
- Drainage from peat and spoil management areas was ultimately routed to an oversized swale at the BPs and a number of settlement ponds with appropriate storage and settlement designed for a 1 in 100 year 6 hour return period before being discharged to the on-site drains.
- Peat and spoil management areas, particularly the locations of side-cast peat, were sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in runoff. Once re-vegetated and stabilised peat/subsoil storage areas were no longer a potential source of silt laden runoff.
- While surface water was contained in these excavations, the design proposal was to control the level of water by creating a single point outlet from the basin-like area that ensured the water did not overtop. The berms associated with the peat cells were constructed in a manner which prevented water retention with large rocks placed with an 'open bond' to allow water to pass through the berm in a controlled manner. Interceptor drains were already installed upgradient of the peat cell areas before construction began.

4.2.1.4 Mitigation Measures for the Protection of Surface and Groundwater Quality at the Borrow Pits

All borrow pits were excavated and backfilled in accordance with the environmental management measures set out in the 2019 CEMP.

Mitigation measures with respect to the protection of water quality included:

- 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;
- 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.
- Run-off from the borrow pit areas was controlled via a single outlet that was installed at each borrow pit.
- Where required additional specialist treatment, including sediment bags and silt fences, was employed to ensure no deterioration in downstream water quality occurred.

4.2.1.5 Mitigation Measures from Morphological Changes to Watercourses at the Wind Farm Site

The clear-span bridge over the Bunadowen River was upgraded to the specifications of the Office of Public Works (OPW) bridge design guidelines 'Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945', and in consultation with Inland Fisheries Ireland (IFI).

Mitigation measures are detailed below:

- Works were monitored by the ECoW
- The crossing was a clear span bridge and the banks remained undisturbed. No in-stream excavation works occurred at this location and therefore there was no direct impact on the Bunadowen River at the crossing location.
- All guidance / mitigation measures required by the OPW and/or the Inland Fisheries Ireland (IFI) was incorporated into the design of the crossing;
- All drainage measures were installed in advance of the works;
- Plant and equipment were not permitted to track across the watercourse;
- Access to the opposite side of the watercourse for excavation and foundation installation was provided via the existing access road;
- Steel boxes for concrete reinforcement were constructed in close proximity to the work for ease of installation and were fixed by competent persons. Steel boxes were placed into position by a 360 excavator. Concrete was placed using an excavator or, where practical, poured from the chute of a truck. A banksman directed the truck once on-site.
- Concrete plinths were poured as per the structural designer's request.

In relation to the construction of culverts on other watercourses:

- Culverts were designed and installed in accordance with designer requirements and OPW and IFI guidance to maintain natural hydrological conditions and fish passage.
- The culvert gradients were constructed to match the natural channel gradient.
- The watercourse bed and banks upstream and downstream of the crossing were reinstated to their original profile and stabilised immediately following construction.
- Culverts were sized to accommodate design flows, including allowance for climate change where required.

4.2.1.6 Mitigation Measures for the Protection of Surface Water Quality During Excavation Dewatering

Management of groundwater seepages and subsequent treatment prior to discharge into the drainage network was completed as follows:

- Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations were put in place;
- If required, pumping of excavation inflows prevented build-up of water in the excavation;
- The interceptor drainage discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters;
- The pumped water volumes were discharged via volume and sediment attenuation ponds adjacent to excavation areas, along with use of more specialist treatment systems such as a Silt bags;
- There was no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination occurred; and,
- Monitoring of excavations by a suitably qualified person occurred during the construction phase.

4.2.1.7 Mitigation Measures for the Protection of Groundwater Quantity

Relevant environmental management guidelines from the EPA quarry 2006 guidance document – "Environmental Management in the Extractive Industry" in relation to groundwater issues were implemented during the construction phase. The mitigation measures and construction methodologies for the borrow pits are detailed in full in the 2019 CEMP. No specific mitigation measures were required with respect to the protection of groundwater quantity due to the hydrogeological (Poor Aquifer) and topographic (200-300mOD) setting of the Wind Farm Site and Grid Connection Site. No significant groundwater dewatering occurred during the construction of the Existing Development.

4.2.1.8 Mitigation Measures for the Protection of Surface and Groundwater Quality from Hydrocarbons

The mitigation measures implemented to avoid release of hydrocarbons were as follows:

- All plant was inspected and certified to ensured that they were leak free and in good working order prior to use.
- 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 Wind Farm Site and Grid Connection Site.
- Heavy plant and machinery were refuelled on-site by a fuel truck that came to the Wind Farm 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.
- An emergency plan for the construction phase to deal with accidental spillages was included within the Construction and Environmental Management Plan (Appendix 4-3). Spill kits were available to deal with and accidental spillage in and outside the re-fuelling area. However no spills were recorded during the construction of the Existing Development.

4.2.1.9 Mitigation Measures for the Protection of Surface and Groundwater Quality from Cement-Based Products

The mitigation measures implemented with respect to cement-based products were as follows:

- Only ready-mixed concrete was used during the construction phase, with all concrete being delivered from local batching plants in sealed concrete delivery trucks.
- No on-site batching was carried out.
- When concrete was delivered to the Wind Farm Site, only the chute of the delivery truck was cleaned, using the smallest volume of water necessary, before leaving the Wind Farm Site.
- Water generated from washing the concrete lorry's chute was directed into a temporary lined impermeable containment area. Once evaporated, any remnants of concrete were disposed of along with other construction waste.
- Concrete trucks were directed back to their batching plant for washout.
- Site roads were constructed to a high standard to allow transport of the turbine components around the Wind Farm Site, and hence, concrete delivery trucks were able to access all areas where the concrete was needed.
- No concrete was transported around the Wind Farm Site in open trailers or dumpers to avoid spillage while in transport.
- All concrete used in the construction of turbine bases was pumped directly into the shuttered formwork from the delivery truck. If this was not practical, the concrete was pumped from the delivery truck into a hydraulic concrete pump or into the bucket of an excavator, which transferred the concrete to the location where it was needed.

4.2.1.10 Mitigation Measures for the Protection of Surface and Groundwater Quality from Wastewater

The mitigation measures implemented to avoid release of wastewater at the Wind Farm Site were as follows:

- A self-contained port-a-loo with an integrated waste holding tank was used for welfare facilities, maintained by the providing contractor;
- Welfare facilities were also present at the onsite substation (constructed as part of the Existing Development). Wastewater was stored in an underground tank and was removed by a licenced contractor;
- Wastewater treatment on-site has not been implemented; and,
- No water was sourced on the Wind Farm Site or discharged on the Wind Farm Site.

4.2.1.11 Mitigation Measures for the Protection of Surface Water Quality along the Grid Connection

The mitigation measures in the preceding sections were implemented with respect to the protection of water quality/quantity at and downstream of the Grid Connection Site.

4.2.1.12 Mitigation Measures for Direction Drilling along the Grid Connection

- The crossing works areas were clearly marked out with fencing or flagging tape to avoid unnecessary disturbance;
- There was no storage of material / equipment or overnight parking of machinery inside the hydrological buffer zone;
- Before any ground works are undertaken, double silt fencing was placed upslope of the watercourse channels;
- Silt fencing was embedded into the local soils to ensure all site water is captured and filtered;

- The area around the batching, pumping and recycling plant was bunded using terram (as it will clog) and sandbags in order to contain any spillages;
- Drilling fluid returns were contained within a sealed tank / sump to prevent migration from the works area;
- Spills of drilling fluid were cleaned up immediately and contained in an adequately sized skip before been taken off-site;
- The discharge of water onto vegetated ground was via a silt bag which filtered any remaining sediment from the pumped water. The entire percolation area was enclosed by a perimeter of double silt fencing;
- Any sediment laden water from the works area was not discharged directly to a watercourse or drain;
- Works did not take place during periods of heavy rainfall and were scaled back or suspended when heavy rain was forecasted;
- Daily monitoring of the works area, the water treatment and pumping system and the percolation area was completed by a suitably qualified person during the construction phase. All necessary preventative measures were implemented to ensure no entrained sediment, or deleterious matter was discharged to the watercourse;
- On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits was carefully reinstated at the soonest opportunity to prevent soil erosion;
- The silt fencing upslope of the river was left in place and maintained until the disturbed ground had re-vegetated; and,
- All plant was checked for purpose of use prior to mobilisation at the watercourse crossing.

The use of a natural, inert, and biodegradable drilling fluid negated any adverse effects arising from the use of other traditional polymer-based drilling fluids. It was used sparingly as part of the drilling operations, appropriately stored prior to use, and deployed in the required amounts to avoid surplus. In the event that any excess drilling fluid accumulated in the reception or drilling pits, it was contained and removed from the Wind Farm Site and Grid Connection Site in the same manner as other subsoil materials associated with the drilling process to an approved licensed waste facility.

4.2.1.13 Emergency Measures Implemented in Response to the November 2020 Peatslide

Following the November 2020 Peatslide, emergency response procedures were implemented in accordance with the 2019 CEMP. These emergency response procedures included the installation of barrage walls downslope of the peat slide to prevent further movement of peat.

Additional water turbidity monitoring sondes (MSe5, MSe6 and MSe7) were also installed along the Mourne Beg River following the peat slide to provide additional data on turbidity concentrations downstream of the Shruhanagarve Stream.

The remedial works were completed in accordance with the emergency response procedures detailed in the 2019 CEMP under the supervision of on-site engineers (Ionic). The remedial works were carried out as follows:

- The construction of Barrage Wall 1 to the northeast of T9 in the immediate aftermath of the peat slide (within 72hrs). The roadway to T9 was significantly raised in height to act as a dam in the aftermath of the Peat Slide.
- Construction of Barrage Wall 2 to the west of T9 in response to the significant risk of additional peat movement. This wall was constructed instream and was subsequently partially removed for the restoration of the stream.
- Construction of Barrage Wall 3 to the north of T7 was constructed to prevent the risk of further peat movement from the primary source of the peat slide. Constructed upslope of the partially completed road to T7.

- Removal of large volumes of peat which became impounded behind Barrage Wall 1 and the installation of a series of interceptor drains to divert clean water away from the peat in order to prevent re-mobilisation.

4.2.1.14 Mitigation for the Protection of Surface Water Quantity

Mitigation by Design
The drainage system of the Existing Development has been installed and constructed in conjunction with and in accordance with the Permitted Development drainage system as follows:

- Interceptor drains have been installed up-gradient of the Existing Development infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. This water is then be directed to areas where it can be re-distributed over the ground by means of a level spreader;
- Swales/road side drains were installed to collect runoff from access roads and turbine hardstanding areas of the Wind Farm Site that are likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling;
- Check dams are used along sections of access road drains to intercept silts at source.;
- Settlement ponds, emplaced downstream of road swale sections and at turbine hardstand locations, 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; and,
- Settlement ponds are designed in consideration of the greenfield runoff rate.

A quantitative analysis presented in Section 9.5.2.20 of the rEIAR demonstrates that the Existing Development footprint would have only resulted in an increase in runoff of 0.13%. The additional volume is low due to the fact that the runoff potential from the Wind Farm Site is naturally high (96%). Also, the calculation assumes that all hardstanding areas are impermeable which is not the case as access tracks were constructed of permeable stone aggregate. Furthermore the calculation is conservative as it assumes that all of the development footprint is hardstand areas and does not account for peat cells or existing access road which were upgraded. Runoff in these areas is the same as the baseline runoff rates. The increase in runoff from the Existing Development is, therefore, negligible. This is before the above mitigation measures were implemented.

4.3 ASSESSMENT OF EFFECTS

4.3.1.1 Surface Waterbodies

Assessment of Effects on SWBs

Surface water quality monitoring has been completed throughout the construction phase in watercourses downstream of the Existing Development. The results of this monitoring are detailed in Section 9.3.7 of the rEIAR and are summarised below:

- No pollution events were recorded during felling operations.

- No spills of hydrocarbons were recorded during the construction of the Existing Development.

- No release of cement-based products were recorded during the construction of the Existing Development.

- No pollution incidents with respect to wastewater were recorded during the construction of the Existing Development.

- With the exception of the effects associated with the November 2020 Peatslide, the available water quality data indicates that there was no significant increase in suspended solids concentrations in downstream watercourses as a result of the construction of the Existing Development.

- Biological monitoring data on the Bunadaowen River and the Mourne Beg River (upstream of the Shruhanagarve Stream) indicates that these watercourses have not experienced any deterioration in biological q-ratings during the construction of the Existing Development. Indeed an improvement in Q-ratings has been recorded on the Bunadaowen River.

- Water quality monitoring completed in the aftermath of the November 2020 Peatslide shows that the concentrations of suspended solids in the Mourne Beg River and the River Derg were elevated for the short period following the peatslide. The effect on suspended solid concentrations was considered to be a temporary effect. The receiving waters quickly recovered and all grab samples obtained since 2021 were below the 25mg/l EQS. The data indicates no evidence of persistent sediment related impacts on the receiving watercourses.

- Biological monitoring also indicates improvements in water quality on the Shruhanagarve Stream and the Mourne Beg River since the November 2020 Peatslide. This is consistent with the water quality monitoring data and the temporary effect associated with the November 2020 Peatslide.

WFD status are available for all SWBs downstream of the Wind Farm Site and Grid Connection Site for the construction phase. A summary of the status change to SWBs arising from the construction activities associated with the Existing Development are detailed in **Table E**.

Within the River Foyle Catchment, the Bunadowen_010 SWB achieved 'Good' status in the latest WFD cycle, this represents an improvement from the 'Moderate' status which this SWB achieved previously. The status of the Mourne Beg_010 SWB has remained unchanged ('Poor' status) across the 3 no. most recent WFD cycles. Meanwhile, the Mourne Beg River (Derrygoonan) SWB achieved 'Poor' WFD status in the latest WFD cycle. This was a deterioration from the 'Moderate' status which this SWB achieved previously. The November 2020 peatslide occurred in the catchment of this SWB and resulted in adverse effects on surface water quality. Section 9.5.2.13 of the rEIAR concludes that the effects were negative, significant, direct and short-term. The effects are considered to be short-term as all available water quality and biological monitoring data indicates that water quality has returned to pre-November 2020 conditions. Further downstream, the Mourne Beg River (Lisnacloone) achieved 'Moderate' status in the 3 no. most recent WFD cycles. The Glendergan River achieved 'Moderate' status in the latest WFD cycle, which represented an improvement from the 'Poor' status which this SWB achieved previously.

Meanwhile, within the Donegal Bay North Catchment, the WFD status of the local watercourses has remained unchanged across the 3 no. most recent WFD cycles.

A summary of the status change to SWBs arising from the construction activities associated with the Existing Development are detailed in **Table E**.

Table E: Surface Water Status Effects During the Construction Phase

SWB	Status 2013-2018	Status 2016-2021	Current Status (2019-2024)
Foyle WFD Catchment			
Bunadaowen_010	Poor	Moderate	Good

Mourne Beg_010	Poor	Poor	Poor
Mourne Beg River (Derrygoonan)	Moderate	Moderate	Poor
Mourne Beg (Lisnacloone)	Moderate	Moderate	Moderate
Derg River (Millbrook)	Moderate	Moderate	Poor
Glendergan River	Moderate	Poor	Moderate
Donegal Bay North WFD Catchment			
Lowerymore_020	High	High	High
Lowerymore_030	High	High	High

4.3.1.2 Effects on Groundwater Bodies

The potential for the Existing Development to effect the overall status of the underlying GWBs was negligible given the scale of these GWBs in comparison to the footprint of the Existing Development. No change in quantitative status has occurred due to the lack of any significant dewatering associated with the Existing Development and the nature of the bedrock aquifer. No change in the qualitative status occurred as no spills of hydrocarbons, cement-based products or release of wastewater occurred at the Wind Farm Site and Grid Connection Site.

Based on the above, we consider that the status of the GWBs post-construction is the same as the baseline conditions. The implementation of the mitigation measures detailed in the EIAR and the CEMP ensured that the construction activities associated with the Existing Development have not negatively impacted groundwater quality.

A summary of the status change to GWBs arising from the construction activities associated with the Existing Development are detailed in **Table F**.

Table F: Ground Water Status Effects During the Construction Phase

SWB	Status 2013-2021	Status 2016-2021	Current Status (2019-2024)
Castlederg	Good	Good	Good
Donegal South	Good	Good	Good

4.3.1.3 Effects on Protected Areas

All construction phase activities associated with the Existing Development were completed in accordance with the mitigation measures for surface water quality protection detailed in the rEIAR. Mitigation measures were implemented in relation to the entrainment of suspended solids, hydrocarbons, cement-based products and wastewater.

As discussed below some significant short-term effects occurred on several designated sites as a result of the November 2020 Peatslide. However, the emergency response measures reduced the magnitude of these effects (the available water quality data indicates that the effect was a temporary effect).

Assessment of Effects:

River Foyle and Tributaries ASSI/SAC

This designated site is located downstream of the Wind Farm Site on the Mourne Beg and Glendergan rivers. With the implementation of the best practice mitigation measures during the construction phase prior to the November 2020 Peatslide there was no significant effects on this designated site. However, the November 2020 Peatslide entered the Shruhangarve Stream which provided a direct hydrological connection to this designated site and resulted in significant negative effects associated with liquified peat entering the watercourse and travelling downstream. However, the emergency response measures, the remedial works, channel reinstatement works and slip scar rehabilitation works have reduced the magnitude and duration of the effects on downstream watercourses. Biological monitoring and water quality monitoring data shows that the Mourne Beg River has returned to baseline conditions. Therefore, the negative effects on this designated site were temporary in duration.

River Finn SAC

This designated site is located downstream of the Wind Farm Site on the Mourne Beg River. With the implementation of the best practice mitigation measures during the construction phase prior to the November 2020 Peatslide there would have been no significant effects on this designated site. However, the November 2020 Peatslide entered the Shruhangarve Stream which provided a direct hydrological connection to this designated site and resulted in significant negative effects associated with liquified peat entering the watercourse and travelling downstream. However, the emergency response measures, the remedial works, channel reinstatement works and slip scar rehabilitation works have reduced the magnitude and duration of the effects on downstream watercourses. Biological monitoring and water quality monitoring shows that the Mourne Beg River has returned to baseline conditions. Therefore, the negative effects on this designated site were temporary in duration.

Croaghonagh Bog SAC/pNHA

This designated site is located downstream of the Wind Farm Site and a section of the Grid Connection via the Mary Breen's Burn. No deterioration in downstream surface water quality occurred as a result of the Existing Development within the Mary Breen's Burn. Similarly, no spills or pollution incidents occurred which could have impacted local groundwater quality. No significant effects occurred on this designated site.

Cashelnavean Bog NHA

A small section (~580m) of the Grid Connection overlaps with this designated site along the N15. The NHA is located to the north of this national road, which is upgradient of the Grid Connection, with topography in this area sloping steeply to the south. All works in this area took place downgradient of the NHA and in the carriageway of the existing road network, limiting the potential for effects. Nevertheless, tried and tested mitigation measures for the protection of surface and groundwater quality were implemented during the works along the Grid Connection. No spills or pollution incidents occurred which could have impacted local groundwater quality. No significant effects occurred on this designated site.

Lough Eske SAC

This designated site is located downstream of the Grid Connection along the Lowerymore River. The potential for effects would have been limited due to the minor and transient nature of the works. These works are similar to roadworks completed across the country. No pollution events were recorded along the Grid Connection. No significant effects occurred on this designated site.

Croagh Bog ASSI

Croagh Bog ASSI (ASSI378) is located downstream of the Wind Farm Site and along the lower reaches of the Shruhangarve Stream. With the implementation of the best practice mitigation measures during the construction phase prior to the November 2020 Peatslide there would have been no significant effects on this designated site. However, the peatslide entered the Shruhangarve Stream which provided a direct hydrological connection to this designated site and resulted in significant negative effects associated with liquified peat entering the watercourse and travelling downstream. However, the emergency response measures, the remedial works, channel reinstatement works and slip scar rehabilitation works have reduced the magnitude and duration of the effects on downstream watercourses. Biological monitoring and water quality monitoring shows that the Mourne Beg River has returned to baseline conditions. Therefore, the negative effects on this designated site were temporary in duration.

Lough Mourne DWPA

No significant increase in suspended solids entrainment was recorded in the Bunadaowen River. No pollution events occurred in this watercourse during the construction phase. Daily monitoring of the Bunadaowen River by the project ECoW found no evidence of gross siltation. Monthly water quality sampling indicates that there has been no deterioration in water quality from the pre-construction condition. EPA monitoring data, based on biological factors, and water quality monitoring, indicates that that there has been no deterioration in water quality. No significant effects occurred on this DWPA.

Lough Cullionboy DWPA

The works along the Grid Connection were shallow, transient and minor in nature. These works were comparable to roadworks which are completed across the country. The Grid Connection is also located a significant distance (~370m) distance from the DWPA and no direct hydrological connections exist between the Grid Connection and DWPA. Furthermore any shallow groundwater flow in the area of the Grid Connection closest to the DWPA (i.e. in the vicinity of Clogher 110kV Substation) will flow to the north and discharge into Lough Craig which is downstream of Lough Cullionboy. Therefore, no significant effects occurred on this DWPA.

4.4 POTENTIAL EFFECTS ON QUALITY ELEMENTS WITH THE IMPLEMENTATION OF MITIGATION

A summary of potential effects on SWB quality elements is provided in **Table G**, and a summary of status changes to SWBs arising from potential surface water quality element impacts of the Existing Development are presented in **Table E**.

Table G: Potential Impacts on receiving SWB Quality Elements

SWB Quality Element	Post Mitigation Potential Risk To Downstream Receptors	Reasoning
Hydromorphology	No	Refer to Section 4.2.1.5
Water Quality	No	Refer to Sections 4.2.1.1, 4.2.1.2, 4.2.1.3, 4.2.1.4, 4.2.1.6, 4.2.1.7, 4.2.1.8, 4.2.1.9, 4.2.1.10, 4.2.1.11 and 4.2.1.12.
Biology/Habitats	No	Refer to Sections 4.2.1.1, 4.2.1.2, 4.2.1.3, 4.2.1.4, 4.2.1.6, 4.2.1.7, 4.2.1.8, 4.2.1.9, 4.2.1.10, 4.2.1.11 and 4.2.1.12.
Biology/Fish	No	Refer to Sections 4.2.1.1, 4.2.1.2, 4.2.1.3, 4.2.1.4, 4.2.1.6, 4.2.1.7, 4.2.1.8, 4.2.1.9, 4.2.1.10, 4.2.1.11 and 4.2.1.12.
Protected Areas	No	Refer to Section 4.3.1.3

A summary of potential effects on GWB quality elements is provided in **Table H**, and a summary of status change to GWB Status arising from potential groundwater quality element impacts of the Existing Development is presented in **Table F**.

Table H: Potential Impacts on receiving GWB Quality Elements

GWB Quality Element	Post Mitigation Potential Risk To Downstream Receptors	Reasoning
Saline Intrusion	No	Existing Development had no effect on salinity of groundwater, and there is no proximity to the sea that could cause saline intrusion.
Surface Water Quality	No	Refer to Sections 4.2.1.1, 4.2.1.2, 4.2.1.3, 4.2.1.4, 4.2.1.6, 4.2.1.7, 4.2.1.8, 4.2.1.9, 4.2.1.10, 4.2.1.11 and 4.2.1.12.
GWDTE	No	All the downstream designated sites are associated with Rivers, please refer to Section 4.3.1.3.
Water Balance Test	No	No long-term groundwater abstraction proposed, so no potential to effect GWB water balance.
DWPAs	No	Refer to Section 4.3.1.3.

4.5 CUMULATIVE EFFECTS

This section presents an assessment of the cumulative effects associated with the construction phase of the Existing Development and other developments (existing and/or proposed) on the hydrological and hydrogeological environment.

The main likelihood of cumulative effects is considered to relate to the hydrological environment (surface water) rather than the hydrogeological (groundwater) environment. Due to the hydrogeological setting of the Wind Farm Site and Grid Connection Site (i.e. low permeability peat overlying a Poor Bedrock Aquifer) and the near surface nature of construction activities associated with the Existing Development, cumulative effects with regard groundwater quality or quantity arising from the Existing Development are assessed as unlikely.

The cumulative hydrological study area includes:

- The catchment of the Mourne Beg River downstream as far as its confluence with the River Derg;
- The catchment of the Glendergan River downstream as far as its confluence with the River Derg; and,
- The Lowerymore River downstream as far as Lough Eske.

There will be no potential for cumulative effects beyond this cumulative hydrological study area due to increases in flow volumes in the River Derg, the large volumes of water within Lough Eske and the increasing distance from the Wind Farm Site and Grid Connection Site.

The main likelihood of cumulative effects occurred during the construction of the Existing Development as this is when earthworks were completed and there was the greatest potential for qualitative effects on the hydrological environment. The potential for cumulative effects during the post construction phase of the Existing Development will be significantly reduced in comparison to the construction phase. During this phase there will be no exposed excavations, there will be no sources of sediment to reach watercourses, there will be no use of cementitious materials and fuels/oil will be kept to a minimum at the Wind Farm Site and Grid Connection Site. These effects are equivalent to what was assessed in the EIAR for the

Existing Development. During the decommissioning phase, the potential cumulative effects are similar to the construction phase, but to a lesser degree with less ground disturbance. These effects are equivalent to what was assessed in the EIAR for the Existing Development.

Cumulative Effects with Forestry

The Wind Farm Site is located in an area of coniferous forestry. The most common water quality problem arising from forestry relate to the release of sediment and nutrients to the aquatic environment, and impacts from acidification. Forestry may also give rise to modified stream flow regimes caused by associated changes in land drainage.

Due to the close proximity of the Existing Development to forested areas and given that they drain to the same watercourses as the Existing Development, there was potential for cumulative effects on downstream surface water quality to occur.

However, the continuous turbidity monitoring did not record any significant increase in suspended solids entrainment in downstream watercourses during the construction of the Existing Development. Additionally, the monthly water quality sampling indicates that there has been no deterioration in the water quality of downstream watercourses from the pre-construction phase. Biological monitoring also indicates that there has been no deterioration in downstream water quality.

Therefore, based on the large dataset of water quality data, it can be concluded that there was no significant cumulative effect associated with the commercial forestry activities.

Cumulative Effects with Peatslide Remediation Works

Restoration works were carried out to the Shruhangarve Stream and the peatslide slip scar in response to a notice issued by Donegal County Council (DCC) dated 17th November issued under Section 12 (1) of the Local Government (Water Pollution) Acts, relating to the discharge of peat, sediment, and heavily soiled water from the Wind Farm Site to the Shruhangarve Stream and Mourne Beg River.

These works included the following:

- The removal of fallen trees and debris to aid revegetation;
- Manual seeding of slip scar with native grass and sedge species
- Live stakes were installed on both sides of an existing drainage channel to provide stability through the establishment of fast growing native willows; and,
- Manual planting with native bare root saplings.
- Removal of blockages from stream channel,
- In areas where the channel as poorly defined, a new channel was constructed through a combination of excavation and reconstruction of lost stream banks using vegetated geogrids.
- Installation of grade control and rock drop structures as necessary
- Installation of coir matting on banks to aid revegetation and provide temporary erosion protection.

There was limited potential for the reinstatement works to result in significant effects on downstream surface water quality due to the context within which the works were being completed (i.e. in the immediate aftermath of a significant peatslide). Furthermore, the implementation of best practice reinstatement methods and practices ensured that there was no significant negative effects. The residual effect has been a positive, moderate, short-term, indirect effect on downstream surface water quality.

Since the effect of the remediation works has been positive there is no potential for negative cumulative effects with the Existing Development.

Prospective Development

The Prospective Development includes all works required to bring the Meenbog Wind Farm to completion. In the absence of mitigation measures, there is potential for cumulative effects

on the hydrological environment due to the earthworks being completed at the Wind Farm Site.

However, the EIAR for the Prospective Development details potential hydrological and hydrogeological issues relating to the works required to complete the wind farm development. The EIAR prescribes a suite of best practice mitigation measures designed to ensure that the Prospective Development does not in any way have a negative effect on downstream surface water quality and quantity. These mitigation measures will be detailed in the CEMP for the Prospective Development.

Therefore, with the implementation of the prescribed mitigation measures (both in the accompanying EIAR and the CEMP for the Prospective Development), there would be no potential for cumulative effects associated with the Prospective Development.

Other Developments

Due to the remedial nature of this rEIAR and cumulative assessment, a search of local planning applications dated from 2016-2021 was completed within the hydrological study area. The period from 2016-2021 was chosen to include any potential developments which may have occurred during the construction phase of the Existing Development.

The planning applications identified within the hydrological study area are listed in Appendix 2-1 of the rEIAR and relate to one-off housing developments and associated domestic water treatment systems. These developments are small scale and localised in nature. No significant effects on water quality or flows (surface water or groundwater) would result from such developments. Therefore, there were no hydrological cumulative effects with respect to the Existing Development.

5. CONCLUSIONS

WFD status for SWBs (Surface Water Bodies) and GWBs (Groundwater Bodies) hydraulically linked to the Wind Farm Site and the Grid Connection are defined in **Section 2** above.

The construction activities associated with the Existing Development, in the absence of mitigation measures, would have had the potential to impact on the status of downstream SWBs and the underlying GWBs. However, all construction activities were completed in accordance with the best practice mitigation measures for the protection of the local water environment.

Consultation with the available WFD information has revealed that the status of the Mourne Beg River (Derrygoonan) SWB has experienced a deterioration to 'Poor' status from 'Moderate' status in the latest WFD cycle. This deterioration is a likely consequence of the November 2020 Peatslide which occurred in the catchment to this SWB. However, emergency response measures were implemented in the immediate aftermath of the peatslide and reduced the magnitude of the potential negative effects. Remedial and reinstatement works were also completed. Subsequent biological monitoring in the downstream watercourses has shown that the biological Q-status has since returned to pre-peatslide levels. Water quality monitoring on the Mourne Beg River also shows that the November 2020 Peatslide had a temporary effect on water quality. As a result, all qualitative effects associated with the peatslide have been temporary.

Other watercourses in the vicinity of the Wind Farm Site and Grid Connection Site have experienced either no change in WFD status or an improvement (Bunadaowen_010 SWB) in WFD status during the construction and post-construction phases of the Existing Development. The mitigation measures implemented during the construction and post-construction phases ensured that the Existing Development did not result in any deterioration of WFD status in these SWBs.

It is noted that the Derg River (Millbrook) experienced a deterioration in WFD status in the latest WFD cycle. However, the Mourne Beg River (Lisnacloone) SWB, upstream of the Derg River (Millbrook) SWB, did not experience any deterioration in WFD status. Therefore, the change in status in the Derg River (Millbrook) SWB likely reflects other pressures in its catchment and are not attributed to activities at the Wind Farm Site and Grid Connection Site associated with the Existing Development.

In terms of GWBs, the Existing Development did not include any abstraction of groundwater. Furthermore, due to the local hydrogeological (underlain by a Poor Bedrock Aquifer) and topographic setting (at a significant elevation on the side of a hill) setting of the Wind Farm Site and Grid Connection Site, there were no quantitative effects on the underlying GWBs. In addition, the mitigation measures implemented during the construction and post-construction phases ensured that there were no significant effects on local groundwater quality as a result of the Existing Development. The underlying GWBs have not experienced any change in WFD status.

As such, the construction and post construction phases activities:

- Have not caused a deterioration in the status of most of the surface and groundwater bodies assessed;
- The exception is the Mourne Beg_010 SWB which experienced a deterioration in WFD status, likely as a result of the November 2020 peatslide. However, biological monitoring has shown that the effects have been short-term and that water quality is now at the same level as pre-November 2020;
- Have not jeopardised the objectives to achieve 'Good' surface water/groundwater status;

- Have not jeopardised the attainment of 'Good' surface water/groundwater chemical status;
- Have not jeopardised the attainment of 'Good' surface water/groundwater quantity status;
- Have not permanently excluded or compromised the achievement of the objectives of the WFD in other waterbodies within the same river basin district;
- Have been compliant with the requirements of the Water Framework Directive (2000/60/EC); and,
- Have been consistent with other Community Environmental Legislation including the EIA Directive (2014/52/EU), the Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EC) (Note that a full list of legislation complied with in relation to hydrology and hydrogeology is included in Section 9.1.4 of the rEIAR Chapter 9).

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