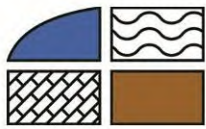


Appendix 12.6. Water Framework Directive (WFD) Compliance Assessment Report



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**WATER FRAMEWORK DIRECTIVE COMPLIANCE ASSESSMENT
MORTARSTOWN WASTEWATER TREATMENT PLANT, CO. CARLOW**

FINAL REPORT

Prepared for:
UISCE ÉIREANN

Prepared by:
HYDRO-ENVIRONMENTAL SERVICES

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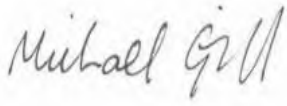
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1. INTRODUCTION

1.1 BACKGROUND

Hydro-Environmental Services (HES) were requested by Atkins Realis on behalf of Uisce Éireann, to complete a Water Framework Directive (WFD) Compliance Assessment for the proposed upgrades of the Mortarstown Wastewater treatment Plant (WwTP), Mortarstown, co. Carlow (*i.e.* the 'Proposed Development').

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

This WFD Compliance Assessment is intended to supplement the Environmental Impact Assessment Report (EIAR) submitted as part of the planning application.

This report has been compiled using the following data sources:

- Environmental Protection Agency database (www.epa.ie);
- Site investigations completed by Priority Geotechnical Limited comprising of trial pit excavations and borehole drilling;
- Site walkover surveys and hydrological monitoring completed by HES;
- Water quality monitoring completed by Uisce Éireann as part of the existing discharge licence.
- Water quality monitoring completed by the EPA, Atkins and HES on the Barrow River (refer to Section 8.3.6 of the EIAR for full details)
- A Site Specific Flood Risk Assessment and Hydrodynamic Technical Report produced by IE Consulting (included as Appendix 8-1 and 8-2 of the EIAR).

All site investigations are detailed in Section 10.2.2 of the EIAR.

1.2 STATEMENT OF AUTHORITY

Hydro-Environmental Services (HES) are a specialist 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 Compliance Assessment was prepared by Michael Gill, Conor McGettigan and Nitesh Dalal.

Michael Gill P.Geo (BA, BAI, Dip Geol., MSc, MIEI) is an Environmental Engineer and Hydrogeologist with over 22 years' environmental consultancy experience in Ireland. Michael has completed numerous hydrological and hydrogeological impact assessments for a variety of development including wind farms and housing developments. He has substantial experience in surface water drainage design, SUDs design and surface water/groundwater interactions.

Conor McGettigan (BSc, MSc) is an environmental scientist with 4 years' experience in the environmental sector in Ireland. Conor holds an M.Sc. in Applied Environmental Science and a B.Sc. in Geology (2016) from University College Dublin. Conor routinely prepares hydrology

and hydrogeology impact assessment reports, WFD compliance reports and flood risk assessment reports for a variety of proposed developments including wind farms, quarries, commercial developments and wastewater treatment plants.

Nitish Dalal (B.Tech, PG Dip., MSc) is an Environmental Scientist with over 7 years' experience in environmental consultancy and environmental management in India. Nitish 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 2027¹. 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 Project 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 AND CLASSIFICATION

2.1 INTRODUCTION

This section identifies those Surface Waterbodies (SWBs), Groundwater Bodies (GWBs) and protected areas with potential to be affected by the Proposed Development and reviews any available WFD information.

2.2 SURFACE WATERBODY IDENTIFICATION

Regionally, the Proposed Development Site is located in the Barrow River WFD catchment in Hydrometric Area 14 of the Southeastern River Basin District. Locally the Proposed Development Site is mapped in the Barrow River sub-catchment (Barrow_SC_090) and the Barrow_160 WFD river sub-basin.

Within the Barrow_160 WFD river sub-basin, the River Barrow (Barrow_160 SWB) flows in a southerly direction close to the western boundary of the Proposed Development Site. The River Barrow (Barrow_160 to Barrow_230 SWBs) continues to the south before the Barrow_240 SWB discharges into the Upper Barrow Estuary transitional waterbody. This transitional waterbody discharges into the Barrow Nore Estuary Upper transitional waterbody. Further downstream, the Barrow Nore Estuary Upper transitional waterbody connects to the New Ross Port transitional waterbody which in turn connects to the Lower Suir Estuary (Little Island - Cheekpoint) transitional waterbody. The Lower Suir Estuary (Little Island - Cheekpoint) transitional waterbody flows down into the Barrow Suir Nore Estuary transitional waterbody which in turn, drains into the Waterford Harbour coastal waterbody. This coastal waterbody is also connected to the Eastern Celtic Sea (HAs 13;17) coastal waterbody.

Figure A below is a local hydrology map of the area.

Table A presents the total upstream catchment area of River Barrow downstream of the Proposed Development Site. The Barrow_160 SWB in the vicinity of the Proposed Development Site has the smallest total upstream catchment area (~2,256km²). The catchment area increases dramatically downstream as more tributaries discharge into the River Barrow. The Barrow_240 SWB has a total upstream catchment of ~2,812km². Therefore, the Barrow_160 SWB will be most susceptible to water quality/quantity impacts associated with the Proposed Development.

Table A: Catchment Area Downstream of the Proposed Development Site

WFD River Sub-Basin	Total downstream Catchment Area (km ²)
Barrow_160	~2,256
Barrow_170	~2,314
Barrow_180	~2,377
Barrow_190	~2,407
Barrow_200	~2,420
Barrow_210	~2,524
Barrow_220	~2,607
Barrow_230	~2,805
Barrow_240	~2,812

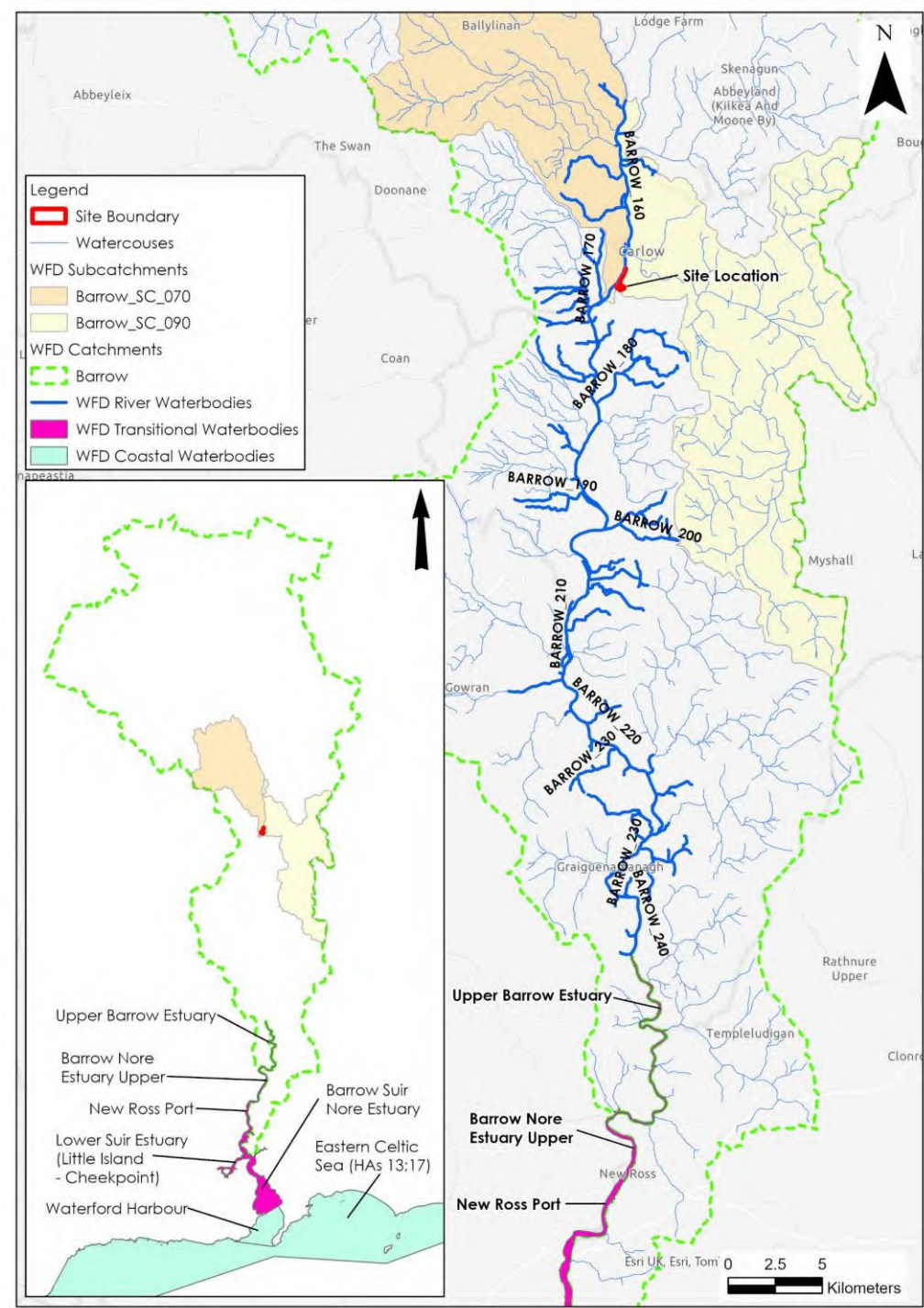


Figure A: Local Hydrology Map

2.3 SURFACE WATER BODY CLASSIFICATION

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

Local GWB and SWB status information is available from (www.catchments.ie).

The River Barrow downstream of the Proposed Development Site (Barrow_160 to Barrow_240 SWBs) generally achieved "Moderate" status in the latest WFD cycle (2019-2024). However, the Barrow_210 and Barrow_230 SWBs achieved "Poor" status. All the sections of the River Barrow downstream of the Proposed Development Site (Barrow_160 to Barrow_240) are deemed to be "at risk" of failing to meet their WFD objectives except for the Barrow_190 and Barrow_240 SWBs whose risk status is currently "under review".

Agriculture is listed as a significant pressure on 4 no. river waterbodies (Barrow_170, 180, 200 and 220 SWBs) downstream of the Proposed Development Site. Hydromorphology is also a significant pressure on 4 no. river waterbodies (Barrow_160, 170, 210 and 230 SWBs). Urban run-off is listed as a significant pressure on 4 no. river waterbodies (Barrow_160, 180, 200 and 210 SWBs). Meanwhile, urban wastewater is identified as being a significant pressure on the Barrow_200 SWB. Industry is listed as a significant pressure on the Barrow_210 SWB.

In regard to transitional waterbodies, all the transitional waterbodies downstream of the Proposed Development Site (Upper Barrow Estuary, Barrow Nore Estuary Upper, New Ross Port, Lower Suir Estuary (Little Island - Cheekpoint) and Barrow Suir Nore Estuary) have achieved "Moderate" status in the latest WFD cycle and are "at risk" of failing to meet their WFD objectives. Agriculture is the identified significant pressure on all of these transitional waterbodies. Urban run-off is also listed as a significant pressure on the Upper Barrow Estuary and Barrow Nore Estuary Upper SWBs.

In terms of coastal waterbodies, the Waterford Harbour coastal waterbody achieved "Good" status in the latest WFD cycle and is "at risk" of failing to meet its WFD objectives. Meanwhile, the Eastern Celtic Sea (HAs 13;17) coastal waterbody achieved "High" status in the latest WFD cycle and is "not at risk" of failing to meet its WFD objectives. Agriculture and urban run-off are the significant pressures on the Waterford Harbour.

The SWB status for the 2016-2021 WFD cycle are shown on **Figure B**.

Table B: Summary WFD Information for Surface Water Bodies

SWB	Overall Status (2013-2018)	Overall Status (2016-2021)	Overall Status (2019-2024)	Current Status Cycle)	Risk (3 rd)	Pressures
Barrow_160	Moderate	Moderate	Moderate	At risk		Hydromorphology and urban run-off
Barrow_170	Moderate	Moderate	Moderate	At risk		Hydromorphology and agriculture
Barrow_180	Moderate	Moderate	Moderate	At risk		Urban run-off and agriculture
Barrow_190	Unassigned	Moderate	Moderate	Under review		None
Barrow_200	Good	Moderate	Moderate	At risk		Urban run-off, agriculture and urban wastewater
Barrow_210	Poor	Poor	Poor	At risk		Urban run-off, hydromorphology and industry
Barrow_220	Moderate	Moderate	Moderate	At risk		Agriculture
Barrow_230	Poor	Poor	Poor	At risk		Unknown, and hydromorphology
Barrow_240	Moderate	Moderate	Moderate	Under review		None
Upper Barrow Estuary	Good	Moderate	Moderate	At risk		Agriculture
Barrow Nore Estuary Upper	Moderate	Moderate	Moderate	At risk		Urban run-off and agriculture
New Ross Port	Moderate	Moderate	Moderate	At risk		Agriculture
Lower Suir Estuary (Little Island - Cheekpoint)	Good	Moderate	Moderate	At risk		Agriculture
Barrow Suir Nore Estuary	Moderate	Moderate	Moderate	At risk		Agriculture
Waterford Harbour	Moderate	Moderate	Good	At risk		Agriculture and urban run-off
Eastern Celtic Sea (HAs 13;17)	Good	High	High	Not at risk		None

2.4 GROUNDWATER BODY IDENTIFICATION

The Ballyadams Formation is mapped to underlie the majority of the Proposed Development Site and is described by the GSI as crinoidal wackestone/packstone limestone. The eastern side of the Proposed Development Site is underlain by Milford Formation described as peloidal calcarenitic limestone. The bedrock aquifer underlying the Proposed Development Site is classified as Regionally Important Aquifer - Karstified (diffuse) (Rkd). A sand and gravel aquifer is also mapped to overlie the bedrock aquifer in the area of the Proposed Development Site. This overburden aquifer is classified as Regionally important gravel aquifer (Rg).

In terms of the GWBs, the Proposed Development Site is underlain by the Athy-Bagenalstown Gravels GWB (IE_SE_G_160), which is associated with the sand and gravel subsoils in the local area. This aquifer is in turn underlain by the Bagenalstown Lower GWB (IE_SE_G_157) which is associated with the bedrock aquifers.

2.5 GROUNDWATER BODY CLASSIFICATION

The Athy-Bagenalstown Gravels GWB is currently assigned "Good" status, which is defined based on the quantitative status and chemical status of the GWB. This represents an improvement from the "Poor" status which this GWB has been previously assigned in the 2016-2021 cycle. The Athy-Bagenalstown Gravels GWB is "at risk" of failing its WFD objectives and agriculture is identified as a significant pressure. Meanwhile, the Bagenalstown Lower GWB (IE_SE_G_157) achieved "Good" status in the 3 no. most recent WFD cycles. This GWB is deemed to be "not at risk" of failing its WFD objectives. No significant pressures have been identified to be impacting this GWB.

The GWB status for the 2019-2024 WFD cycles are shown on **Figure B**.

Table C: Summary WFD Information for Groundwater Bodies

GWB	Overall Status (2013-2018)	Overall Status (2016-2021)	Overall Status (2019-2024)	Risk Status	Pressures
Athy-Bagenalstown Gravels	Good	Poor	Good	At risk	Agriculture
Bagenalstown Lower	Good	Poor	Poor	Not at risk	None

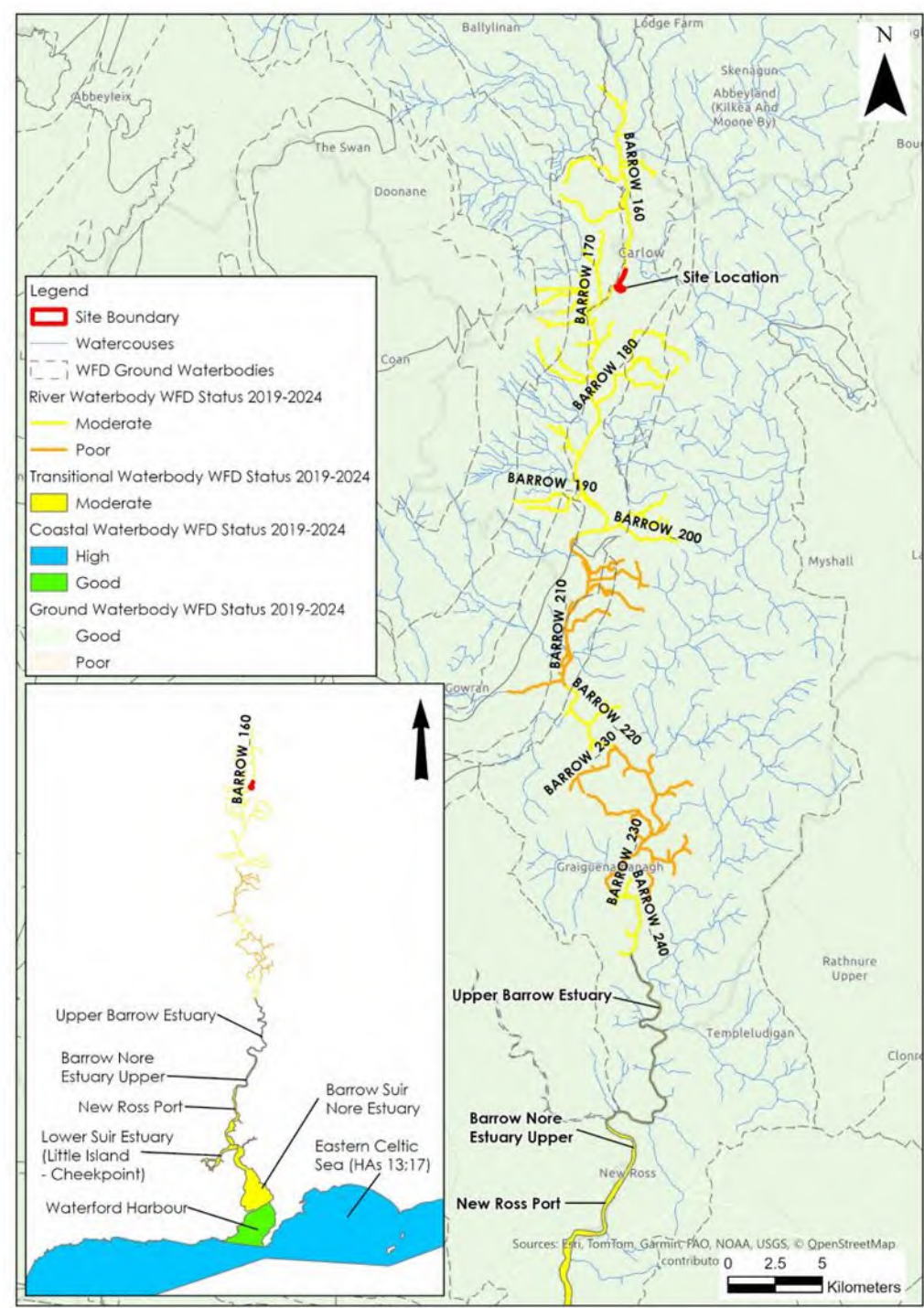


Figure B: WFD Groundwater and Surface Waterbody Status (2019-2024)

2.6 ZONE OF INFLUENCE

The Zone of Influence (Zoi) of the Proposed Development includes the following SWBs and GWBs:

- SWBs – River Barrow (Barrow_160 to Barrow_240);
- GWBs – Athy-Bagenelstown Gravels and Bagenalstown Lower GWBs; and,
- Transitional and Coastal waterbodies – Upper Barrow Estuary, Estuary, Barrow Nore Estuary Upper, New Ross Port, Lower Suir Estuary (Little Island - Cheekpoint), Barrow Suir Nore Estuary, Waterford Harbour and Eastern Celtic Sea (HAs 13;17).

2.7 PROTECTED AREAS IDENTIFICATION

2.7.1 Nature Conservation Designations

Proposed Natural Heritage Areas (pNHAs), Special Areas of Conservation (SACs), candidate Special Areas of Conservation (cSAC) and Special Protection Areas (SPAs). Ramsar sites are wetlands of international importance designated under the Ramsar Convention (adopted in 1971 and came into force in 1975), providing a framework for the conservation and wise use of wetlands and their resources.

The Proposed Development Site is not located within any designated conservation site.

The nearest designated site is the River Barrow and River Nore SAC (Site Code: 002162) which is located adjacent western boundary of the Proposed Development.

There are downstream hydrological connections with some Natura 2000 sites within the River Barrow surface water catchment. Designated sites that lie downstream of the Proposed Development include:

- Cloghrick Wood pNHA (Site Code: 000806) located ~4.4km south of the Proposed Development;
- Clohastia pNHA (Site Code: 000830) is located downstream and at ~28.7km south (straight line distance) of the Proposed Development; and,
- Barrow River Estuary pNHA (Site Code: 000698) is located downstream and at ~39.5km south (straight line distance) of the Proposed Development.

Other protected sites located within 10km of the Proposed Development Site but are not directly linked via surface water pathways are considered below:

- Oakpark pNHA (Site Code: 000810) located ~4.6km northeast of the Proposed Development Site; and,
- Coan Bogs NHA (Site Code: 002382) located ~9.8km west of the Proposed Development Site.

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 designated bathing waters located in the vicinity of the Proposed Development Site. Duncannon bathing water (IESEBWT100_0100_0100) is the closest designated bathing water downstream of the Proposed Development. This is located ~66.5km to the south (straight line distance).

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.

The River Barrow (Barrow_160 to Barrow_240 SWBs) and the downstream transitional SWBs (Upper Barrow Estuary, Barrow Nore Estuary Upper, New Ross Port, Lower Suir Estuary (Little Island - Cheekpoint)) are the listed as NSAs. The EPA carried out a review of NSAs downstream of large urban wastewater discharges in 2020. Once the regulations are in place, and nutrient sensitive areas have been identified, additional nutrient removal must be applied (if not already applied) to wastewater treatment plants discharging to the sensitive area. If this treatment was in place the objective was deemed to have been met.

2.7.4 Shellfish Areas

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 areas located in the vicinity of the Proposed Development Site. The Waterford Harbour (Cheekpoint/Arthurstown/Creadon) shellfish area (IE_SE_100_0100) is the nearest protected shellfish area, located ~60km to the south (straight line distance).

2.7.5 Salmonid Waters

The Salmonid Regulations (S.I. 293 / 1988) identifies the protected river that are designated as Designated Salmonid Waters under S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations 1988, 14th August 1988. The Council Directive 78/659/EEC of 18th July 1978 on the quality of fresh waters needing protection or improvement in order to support fish life and the Council Directive 92/42/EEC of 21st May 1992 on the conservation of natural habitats and of wild fauna and flora was transposed into Irish law under the Fish Directive S.I. 293/1988 and Habitats Directive S.I. 477/2011.

There are no designated Salmonid Waters downstream of the Proposed Development Site.

2.7.6 Drinking Water

According to the 3rd Cycle Barrow Catchment Report (EPA, 2024) there are 6 no. SWBs that are identified as Drinking Water Protected Areas (DWPAs). However, these DWPAs are not located in the vicinity of the Proposed Development Site.

Meanwhile, all GWBs within the catchment, including the Athy-Bagenelstown Gravels and Bagenelstown Lower GWBs, are listed as DWPAs. The assessment of these GWB DWPAs will be included in the assessment of the Proposed Development on the overall qualitative and quantitative status of these GWBs.

3. WFD SCREENING

As discussed in **Section 2**, there are a total of 9 no. river water bodies that are located in the vicinity or downstream of the Proposed Development Site. In addition, there are 5 no. transitional waterbodies and 2 no. coastal waterbody located downstream of the Proposed Development Site. Furthermore, the Proposed Development is underlain by 2 no. GWBs.

3.1 SURFACE WATER BODIES

With consideration for the construction, operational and decommissioning phases of the Proposed Development, it is considered that the Barrow_160 SWB will be carried through to the WFD Compliance Assessment due to the location of the Proposed Development within this WFD river sub-basin. The WwTP will discharge treated effluent to the Barrow_160 SWB. Furthermore, the Barrow_170 SWB is located directly downstream of the Barrow_160 SWB and will be carried through to the WFD Compliance Assessment. The Proposed Development must not in any way result in a deterioration in the status of these SWBs and/or prevent them from meeting the biological and chemical characteristics for good status in the future.

The Barrow_180 to 240 SWBs have been screened out of further assessment due to the large volumes of water within the Barrow River (associated with the large catchment area) and their distant location from the Proposed Development. Furthermore, all transitional and coastal waterbodies downstream of the Proposed Development have been screened out of further assessment due to the large volumes of water within these SWBs and the saline nature of these waters. The Proposed Development has no potential to cause a deterioration in status of these SWBs and/or jeopardise the attainment of good surface water status in the future.

3.2 GROUNDWATER BODIES

With respect to GWBs, the Athy-Bagenalstown Gravels and Bagenalstown Lower GWBs have been screened in due to their location directly underlying the Proposed Development Site. The Proposed Development works must not in any way result in a deterioration in the status of these GWBs and/or prevent them from meeting their required qualitative and quantitative characteristics in order to achieve good status in the future.

3.3 PROTECTED AREAS

The Proposed Development will discharge treated effluent into the River Barrow which is designated as the River Barrow and River Nore SAC. With consideration for the construction and operational phases of the Proposed Development, it is considered that the River Barrow and River Nore SAC is carried through into the WFD Compliance Assessment.

Cloghristrick Wood pNHA is located ~4.4km south of the Proposed Development and is associated with Barrow_180 SWB. Cloghristrick Wood pNHA has been screened out due to large upstream catchment area (~2,377km²) of the Barrow_180 SWB. Therefore, the Proposed Development has no potential to impact this pNHA.

Clohasia pNHA and the Barrow River Estuary pNHA are located ~28.7km and ~39.5km south of the Proposed Development. These designated sites have been screened out of the WFD Compliance Assessment due to their distant location from the site and large upstream catchment area of the River Barrow. Therefore, the Proposed Development has no potential to impact these pNHA.

Oakpark pNHA and Coan Bogs NHA are located ~4.6km northeast and ~9.8km west of the Proposed Development respectively. These designated sites have been screened out due to

the lack of hydrological and hydrogeological connections with the Proposed Development Site. Therefore, the Proposed Development has no potential to impact these designated sites.

The Proposed Development is located within the Barrow_160 WFD river sub-basin. Therefore, the River Barrow NSA will be included in the WFD Compliance Assessment.

Meanwhile, all transitional waterbodies NSAs has been screened out due to the large volumes of water within these NSAs and their distant location from the Proposed Development. The Proposed Development has no potential to impact the status of these NSA.

The Waterford Harbour (Cheekpoint/Arthurstown/Creadon) shellfish area has been screened out due its distant location from the Proposed Development and the large volumes of water within the estuary at this location.

In terms of DWPAs, the Athy-Bagenalstown Gravels and Bagenalstown Lower DWPAs are included for further assessment due to their location underlying the Proposed Development.

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	River	Barrow_160	Yes	The Proposed Development Site is located within the Barrow_160 WFD river sub-basin. Therefore, an assessment is required to consider the potential impacts of the Proposed Development on this SWB.
	River	Barrow_170	Yes	The Barrow_170 SWB has been screened in as it is located directly downstream of the Barrow_160. Therefore, an assessment is required to consider the potential impacts of the Proposed Development on this SWB.
	River	Barrow_180	No	The Barrow_180 SWB has been screened out due to its large upstream catchment (~2,377km ²), the large volumes of water within this SWB and its distant location from the Proposed Development Site. The Proposed Development has no potential to impact the status of this SWB.
	River	Barrow_190	No	The Barrow_190 SWB has been screened out due to its large upstream catchment (~2,407km ²), the large volumes of water within this SWB and its distant location from the Proposed Development Site. The Proposed Development has no potential to impact the status of this SWB.
	River	Barrow_200	No	The Barrow_200 SWB has been screened out due to its large upstream catchment (~2,420km ²), the large volumes of water within this SWB and its distant location from the Proposed Development Site. The Proposed Development has no potential to impact the status of this SWB.
	River	Barrow_210	No	The Barrow_210 SWB has been screened out due to its large upstream catchment (~2,524km ²), the large volumes of water within this SWB and its distant location from the Proposed Development Site. The Proposed Development has no potential to impact the status of this SWB.
	River	Barrow_220	No	The Barrow_220 SWB has been screened out due to its large upstream catchment (~2,607km ²), the large volumes of water within this SWB and its distant location from the Proposed Development Site. The Proposed Development has no potential to impact the status of this SWB.
	River	Barrow_230	No	The Barrow_230 SWB has been screened out due to its large upstream catchment (~2,805km ²), the large volumes of water within this SWB and its distant location from the Proposed Development Site. The Proposed Development has no potential to impact the status of this SWB.
	River	Barrow_240	No	The Barrow_240 SWB has been screened out due to its large upstream catchment (~2,812km ²), the large volumes of water within this SWB and its distant location from the Proposed Development Site. The Proposed Development has no potential to impact the status of this SWB.

				impact the status of this SWB.
	Transitional	Upper Barrow Estuary	No	The Upper Barrow Estuary has been screened out due to distant location and large volume of saline water associated with this SWB. The Proposed Development has no potential to impact the status of this SWB.
	Transitional	Barrow Nore Estuary Upper	No	The Barrow Nore Estuary Upper has been screened out due to distant location and large volume of saline water within this SWB. The Proposed Development has no potential to impact the status of this SWB.
	Transitional	New Ross Port	No	The New Ross Port has been screened out due to distant location and large volume of saline water within this SWB. The Proposed Development has no potential to impact the status of this SWB.
	Transitional	Lower Suir Estuary (Little Island - Cheekpoint)	No	The Lower Suir Estuary (Little Island - Cheekpoint) has been screened out due to distant location and large volume of saline water within this SWB. The Proposed Development has no potential to impact the status of this SWB.
	Transitional	Barrow Suir Nore Estuary	No	The Barrow Suir Nore Estuary has been screened out due to distant location and large volume of saline water within this SWB. The Proposed Development has no potential to impact the status of this SWB.
	Coastal	Waterford Harbour	No	The Waterford Harbour has been screened out due to distant location, large volume of saline water within this SWB. The Proposed Development has no potential to impact the status of this SWB.
	Coastal	Eastern Celtic Sea (HAs 13;17)	No	The Eastern Celtic Sea (HAs 13;17) has been screened out due to distant location, large volume of saline water within this SWB. The Proposed Development has no potential to impact the status of this SWB.
Groundwater Body	Groundwater	Athy-Bagenelstown Gravels	Yes	The Proposed Development directly overlies the Athy-Bagenelstown Gravels GWB. An assessment is required to consider potential impacts of the Proposed Development on this GWB.
		Bagenelstown Lower	Yes	The Proposed Development directly overlies the Bagenelstown Lower GWB. An assessment is required to consider potential impacts of the Proposed Development on this GWB.
Protected Areas	Nature Conservation Designations	River Barrow and River Nore SAC	Yes	The Proposed Development is hydrologically connected to the River Barrow and River Nore SAC via the River Barrow. An assessment is required to consider the potential impacts of the Proposed Development on this designated site.
		Cloghristrick Wood pNHA	No	Cloghristrick Wood pNHA is associated with Barrow_180 SWB and has been screened out due to large upstream catchment area (~2,377km ²) of the Barrow_180 SWB and its distant location from the Proposed Development Site. Therefore, the Proposed Development has no potential to impact the pNHA.
		Clohashtia pNHA	No	Clohashtia pNHA has been screened out due to distant location and the large volumes of water within the River Barrow. Therefore, the Proposed Development has no potential to impact the pNHA.

		Barrow River Estuary pNHA	No	Barrow River Estuary pNHA has been screened out due to distant location and the large volumes of water within the River Barrow. Therefore, the Proposed Development has no potential to impact the pNHA.
		Oakpark pNHA	No	Oakpark pNHA has been screened out due to the lack of hydrological and hydrogeological connections between the Proposed Development and the pNHA. Therefore, the Proposed Development has no potential to impact the pNHA.
		Coan Bogs NHA	No	Coan Bogs NHA has been screened out due to the lack of hydrological and hydrogeological connections between the Proposed Development and the NHA. Therefore, the Proposed Development has no potential to impact the NHA.
	Nutrient Sensitive Areas	Barrow (River)	Yes	The Barrow (River) NSA includes the Barrow_160 SWB. Therefore, an assessment is required to consider the potential impacts of the Proposed Development on this NSA.
		Upper Barrow Estuary	No	The Upper Barrow Estuary NSA has been screened out due to its distant location and the large volume of saline water. The Proposed Development has no potential to impact the status of this NSA.
		Barrow Nore Estuary Upper	No	The Barrow Nore Estuary Upper NSA has been screened out due to its distant location and the large volume of saline water. The Proposed Development has no potential to impact the status of this NSA.
		New Ross Port	No	The New Ross Port NSA has been screened out due to its distant location and the large volume of saline water. The Proposed Development has no potential to impact the status of this NSA.
		Lower Suir Estuary (Little Island - Cheekpoint)	No	The Lower Suir Estuary (Little Island - Cheekpoint) NSA has been screened out due to its distant location and the large volume of water. The Proposed Development has no potential to impact the status of this NSA.
	Shellfish Areas	The Waterford Harbour (Cheekpoint / Arthurstown / Creadon)	No	The Waterford Harbour (Cheekpoint/Arthurstown/Creadon) shellfish area has been screened out due to its distant location and the large volumes of saline water.

4. WFD COMPLIANCE ASSESSMENT

4.1 PROPOSALS

In summary the Proposed Development will comprise of the decommissioning of the existing Kilkenny Road Pumping Station, the construction of a new pumping station to the west of the existing Mortarstown WwTP and the upgrade of the WwTP. A micro tunnel gravity trunk sewer will be constructed to connect the existing pumping station to the new pumping station. This tunnel will travel from the inlet at the existing Kilkenny Road Pumping Station along the R448 before traversing agricultural land and connecting to the WwTP.

The Proposed Development aims to increase the treatment capacity of the WWTP; replace equipment and electrical control equipment nearing the end of their working design life and address deficiencies related to stormwater storage volumes and shallow walled final settlement tanks. The existing Ø600mm outfall pipe will be replaced by a new Ø900mm outfall pipe discharging via a concrete headwall constructed to UÉ specifications.

The key elements of the Proposed Development that have been considered in terms of potential effects on the water environment include:

- The replacement of natural surface with impermeable surfaces;
- Demolition of certain existing infrastructures;
- During the construction phase there will be ~42,000m³ of cut and fill;
- Shallow earthworks and levelling required for landscaping, building foundations etc;
- Micro tunnelling along the R488;
- Deeper earthworks and excavations required for the construction of the new pump station (14.3mbgl), stormwater tank, settlement tanks (primary and final), RAS/WAS sump (10.5mbgl), sludge blending tank, picket fence thickener, aeration tanks and foul pump sump;
- Provision of a borehole to supply wash water to the Proposed Development;
- Construction of the new outfall and outfall chamber adjacent to the River Barrow. The construction will require a temporary instream cofferdam, open trench and/or trenchless techniques to install the outfall pipe, headwall and associated non-return valve; and,
- The discharge of treated effluent to the River Barrow.

Operational Phase Discharge

During the Operational Phase, the Proposed Development will operate in accordance with its discharge licence.

The Proposed Development will upgrade the existing WwTP from its current design capacity of 36,000PE (population equivalent) to a future forecasted 25-year design horizon loading of 58,500PE. The proposed Dry Weather Flows (DWF) is estimated to be 15,344m³/day whilst the future design flow (1.25*DWP) is 16,416m³/day.

Emission Limit Value (ELV) requirements calculations and assimilative capacity assessments were carried out by Uisce Éireann as part of the plant design. The purpose of carrying out ELV calculations was to determine the effluent discharge conditions required for the receiving watercourse to meet 'Good' WFD status. Existing water quality data show that the BOD, ammonia and orthophosphate background concentrations in the River Barrow exceed 75% of the EQS limit upstream of Mortarstown WwTP discharge point. This means that the waterbody is "at risk" of not achieving "Good" indicative quality at the discharge point for each of these parameters due to upstream pressures in water quality. Therefore, the "Notionally clean" approach has been applied in setting the ELVs for BOD, ammonia and

orthophosphate for Mortarstown WwTP. This approach allows for assessment of the discharge impacts in isolation and ensures that the ELVs are compatible with the achievement of target water quality under WFD following mitigation of other upstream water quality pressures.

The proposed ELVs determined from the assessment are 25mg/l BOD, 1.2 mg/l ammonia and 1mg/l ortho-phosphate.

4.2 POTENTIAL EFFECTS

4.2.1 Construction Phase (Unmitigated)

4.2.1.1 Potential Surface Water Quality/Quantity Effects

Construction phase activities will require earthworks resulting in the removal of vegetation cover and the excavation of soils and subsoils. These activities have the potential to result in the entrainment of suspended solids in surface water runoff.

Several elements of the Proposed Development will also require deep excavations, below the shallow groundwater table in the overburden aquifer and will require temporary dewatering. This will create additional volumes of water to be treated by the construction phase water management system.

Hydrocarbons, chemicals and cement-based compounds will also be used during the construction phase and pose a risk to surface water quality.

The construction of the new outfall involves the replacement of the existing Ø600mm outfall pipe with a new Ø900mm outfall pipe. The construction of the new outfall and associated headwall will involve some instream works which has the potential to effect local surface water quality and flow regimes in the River Barrow. It is proposed that the outfall pipe will enter the river ~1.5m below the low water level. These instream works have the potential to result in elevated concentrations of suspended solids and to alter water levels and flow volumes.

Any effects on surface water quality will be temporary and will only occur whilst the construction works are ongoing. Therefore there is limited potential for the works to change the overall qualitative status of the SWB.

Similarly, the works at the outfall location will be completed over a short time period. A Hydrodynamic Technical Report (IE Consulting, 2025) is included as Appendix 8-2 of the EIAR and found that there will be a minor limited increase in water levels and flow velocities during the construction phase. However, these effects are limited to the immediate construction area and will not result in an increase in erosion, accretion or sediment transport at this location. The sheet piling will be a temporary construction and will only be in place for a short duration whilst the construction works are ongoing.

A summary of potential status change to SWBs arising from surface water quality impacts during the construction phase of the Proposed Development in an unmitigated scenario are outlined in **Table E**.

Table E: Surface Water Quality Effects During the Construction Phase (Unmitigated)

SWB	WFD Code	Current Status	Assessed Potential Status Change
Barrow_160	IE_SE_14B012460	Moderate	Moderate
Barrow_170	IE_SE_14B012600	Moderate	Moderate

4.2.1.2 Potential Groundwater Quality/Quantity Effects

Accidental spillage during refuelling of construction plant with petroleum hydrocarbons is a major pollution risk to groundwater. The accumulation of small spills of fuels and lubricants during routine plant use can also be a pollution risk. Chemicals such as cement-based compounds also pose a threat to the groundwater environment. Runoff from concrete works can impact on groundwater quality. These sources of contamination have the potential to impact on groundwater quality in the underlying groundwater bodies in the area of the Proposed Development.

However, given the scale of the overall Athy-Bagenelstown Gravels GWB (102km²) and Bagenalstown Lower GWB (142km²) in comparison to the scale of the Proposed Development, there is limited potential for the Proposed Development to impact the overall status of this GWB.

A summary of potential status change to GWBs arising from potential groundwater quality/quantity impacts during the construction phase of the Proposed Development in the unmitigated scenario are outlined in **Table F**. There will be no change in status of the GWB due to the small scale of the works in comparison to the GWB size.

Table F: Potential Effects on Groundwater Quality During the Construction Phase (Unmitigated)

GWB	WFD Code	Current Status	Assessed Status Change	Potential
Athy-Bagenelstown Gravels	IE_SE_G_160	Good	Good	
Bagenalstown Lower GWB	IE_SE_G_157	Good	Good	

4.2.1.3 Potential Effects on Protected Areas

The construction of the new headwall and outfall pipe include works within the River Barrow and the River Barrow and River Nore SAC. These works, and all other proposed works, could transfer poor quality surface water to the River that may affect the conservation objectives of the River Barrow and River Nore SAC. However, due to the relatively localised and short-term nature of the works, along with significant volumes of water within the River Barrow, effects on the status of the River Barrow and River Nore SAC and the Barrow NSA are not likely.

Construction phase activities also pose a risk to groundwater and have the potential to impact the Athy-Bangelstown Gravels and Bagenalstown Lower DWPA's.

4.2.2 Operational Phase (Unmitigated)

4.2.2.1 Potential Effects on Surface Water Quality/Quantity

The upgraded WwTP will discharge treated effluent to the River Barrow. While there are obvious benefits for the hydrology environment resulting from the efficient operation of the upgraded WwTP, discharging treated wastewater may also release substances into the receiving environment such as suspended solids and organic compounds (despite compliance of the quality of treated wastewater with the established standards).

During the operation phase of the Proposed Development the upgraded WwTP will be discharging directly into the River Barrow. The proposed discharge rate is 16,416m³/day, which equates to a flow of 0.19m³/s. The 99%ile flow in the River Barrow ~2km upstream of the Proposed Development Site at Barrow New Bridge (EPA Station Code: 14022) is 7.69m³/s. This means that flows in the Barrow exceed 7.69m³/s 99% of the time. Therefore, the proposed discharge volume equates to only 2.3% of the extreme low flow condition in the River Barrow.

Hence, the increase in discharge associated with the Proposed Development is very small in comparison to the existing natural flows within the River Barrow. In reality, when the river is in low flow the WwTP will not be discharging at its maximum.

The outfall is located in the lower reaches of the Barrow_160 SWB, with the lower reaches of this SWB and the Barrow_170 SWB most susceptible to any potential effects. However, the potential for effects is limited due to the reasons detailed above.

The construction of the new outfall and associated headwall have the potential to interfere with the hydrological regime and flows in the River Barrow. The Hydrodynamic Technical Report (IE Consulting, 2025) concluded that the outfall pipe and headwall would not increase in peak fluvial water levels or flow velocities in comparison to the existing baseline scenario. Furthermore, the assessment found that the constructed headwall will not result in an increase in the peak flood water levels in comparison to the existing baseline scenario.

The upgraded WwTP will reduce the occurrence and frequency of stormwater overflows through the new stormwater tanks. This will have a positive effect on surface water quality in the River Barrow.

A summary of potential status change to SWBs arising from surface water quality/quantity impacts during the construction phase of the Proposed Development in an unmitigated scenario are outlined in **Table G**.

Table G: Surface Water Quality Effects During the Operational Phase (Unmitigated)

SWB	WFD Code	Current Status	Assessed Potential Status Change
Barrow_160	IE_SE_14B012460	Moderate	Moderate
Barrow_170	IE_SE_14B012600	Moderate	Moderate

4.2.2.2 Potential Effects On Groundwater Quality

During the operational phase of the Proposed Development, small volumes of oils, fuels and chemicals will be stored on-site. There is the potential for spills/leaks of chemicals resulting in contamination of groundwater.

However, given the scale of the overall Athy-Bagenelstown Gravels GWB (102km²) and Bagenalstown Lower GWB (142km²) in comparison to the scale of the Proposed Development site, there is limited potential for the Proposed Development to impact the overall status of this GWB.

There is no potential for the Proposed Development to impact the status of the underlying GWBs as outlined in **Table H**.

Table H: Potential Groundwater Quality Effects During Operational Phase (Unmitigated)

GWB	WFD Code	Current Status	Assessed Potential Status Change
Athy-Bagenelstown Gravels	IE_SE_G_160	Good	Good
Bagenalstown Lower GWB	IE_SE_G_157	Good	Good

4.2.2.3 Potential Effects on Protected Areas

During the operational phase, the risk that the Proposed Development may affect the conservation objectives of downstream designated sites is limited provided that there is compliance with the discharge conditions.

4.3 MITIGATION MEASURES

In order to mitigate against the potential negative effects on surface and groundwater quality, quantity and flow patterns, mitigation measures will be implemented during the construction and operational phases of the Proposed Development. These are outlined below.

4.3.1 Construction Phase

4.3.1.1 Mitigation Measures to Surface Water Quality during Earthworks Resulting in Suspended Solids Entrainment

Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work as follows:

- Prior to the commencement of earthworks, silt fencing will be placed down-gradient of the construction areas where drains and drainage pathways are present;
- These will be embedded into the local soils to ensure all site water is captured and filtered;
- All surface drains within and down-gradient of the earthworks/ construction area will be blocked temporarily or where there are minor flows silt fencing will be placed within the existing drain;
- No pumped construction water will be discharged directly into the main surface watercourse;
- Pumped water (if necessary) will be discharged via a silt bag which will filter any remaining sediment from the pumped water. If silt bags are required, the entire silt bag discharge area will be enclosed by a perimeter of double silt fencing. Any discharge of pumped water will be onto a vegetated surface, local to the excavation, for infiltration to ground;
- Daily monitoring of the excavation/earthworks and associated water management systems will be completed by a suitably qualified person during the construction phase (Ecological Clerk of Works (ECoW)). All necessary preventative measures (detailed in this section and in Section 4.3.1.2) will be implemented to ensure no entrained sediment, or deleterious matter will enter any downstream spring areas or watercourses;
- If high levels of silt or other contamination is noted, construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied; and,
- Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses. Monitoring of weather forecasts will be completed (by the ECoW) and construction works will be postponed in the event of an orange or red weather warning for rainfall.

In addition, the sands and gravel deposits associated with the Athy-Bagenalstown GWB are excellent filters and will polish treated construction water within a couple of meters of flow.

4.3.1.2 Mitigation Measures to Surface Water Quality during Excavation Dewatering

Management of groundwater seepages and subsequent treatment prior to discharge into the drainage network will be undertaken as follows:

- Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations will be put in place;
- If required, pumping of excavation inflows will prevent build-up of water in the excavation;
- The interceptor drainage will be discharged onto natural vegetated surfaces downgradient of the excavations and not directly to surface waters;
- The pumped water volumes from excavations will be discharged via temporary volume and sediment attenuation ponds adjacent to excavation areas;

- There will be no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination will occur;
- Treated water from excavations will be discharged over vegetative surfaces and will percolate into the ground due to the permeable nature of the local soils and subsoils;
- Daily monitoring of excavations by a suitably qualified person (ECoW) will occur during the construction phase. If high levels of groundwater seepage inflow occur into the excavation, excavation work will immediately be stopped and a geotechnical assessment undertaken; and,
- The sand and gravel subsoils are excellent filters and will polish treated construction water within a couple meters of flow.

4.3.1.3 Mitigation Measures to Protect Against the Release of Hydrocarbons/Chemicals During Construction and Storage

The proposed mitigation measures to prevent the release of hydrocarbons include the following:

- All plant will be inspected and certified to ensure they are leak free and in good working order prior to use on site;
- On-site re-fuelling of machinery will be carried out using a mobile double skinned fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer or truck will be re-filled off site and will be towed/driven around the site to where machinery is located. The 4x4 jeep/fuel truck will also carry fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level area in the construction compound when not in use and only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations;
- Fuels stored on site will be minimised. Any storage areas will be bunded appropriately for the fuel storage volume for the period of the construction;
- The electrical control building will be bunded appropriately to the volume of oils likely to be stored and to prevent leakage of any associated chemicals and to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor;
- The plant used will be regularly inspected for leaks and fitness for purpose;
- An emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction Environmental Management Plan (CEMP). These measures are summarised as follows:
 - The source of the spill will be identified and stopped;
 - The Environmental Manager will be immediately notified of the spill so that they can take appropriate action;
 - The spill will be contained using spill control materials (for example absorbent pads), ensuring not to spread the spill within the wider environment;
 - If possible, cover or isolate vulnerable areas such as surface water drains;
 - The spill will be cleaned using spill control materials which will be disposed of by a fully licenced waste contractor with the appropriate permits;
 - The Environmental manager will inspect the site to ensure that all measures are in place to prevent further spillage from occurring. Any storage areas are to be fully bunded and spill kits available to deal with accidental spillages; and
 - The Environmental Manager will notify the county council of the spillage and the remedial and preventative actions undertaken.

4.3.1.4 Mitigation Measures to Prevent the Release of Cement-Based Products

The proposed mitigation measures to prevent the release of cement-based products include the following:

- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place;

- Where possible pre-cast elements for culverts and concrete works will be used;
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;
- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water is to be isolated in temporary lined wash-out pits located near proposed site compounds. These temporary lined wash-out pits will be removed from the site at the end of the construction phase;
- Will use weather forecasting to plan dry days for pouring concrete; and,
- Will ensure pour site is free of standing water and plastic covers will be ready in case of a sudden rainfall event.

4.3.1.5 Mitigation Measures to Prevent the Wastewater Disposal

- During the construction phase, a self-contained port-a-loo with an integrated waste holding tank will be used at each of the site construction compounds, maintained by the providing contractor, and removed from the site on completion of the construction works;
- Water supply for the site office and other sanitation will be brought to site and removed after use by a licensed contractor to be discharged at a suitable off-site treatment location; and,
- No water or wastewater will be sourced on the site, nor discharged to the site.

4.3.1.6 Mitigation Measures to Groundwater Levels Due to Temporary Dewatering

The proposed excavations will be within the sands and gravels of the Athy-Bagenalstown Gravels GWB. This is classified as a Regionally Important Gravel Aquifer by the GSI, with site investigations revealing a shallow groundwater table, hosted by these sands and gravels. Estimated permeabilities for the subsoil deposits are variable due to the varying amounts of clay.

The water from excavations will be pumped a short distance to settlement ponds where it will recharge to ground. There will be no net change in groundwater volume, other than its displacement by a short distance during temporary dewatering works.

4.3.1.7 Mitigation Measures to Construction of New Outfall

A cofferdam/temporary shoring will be required to construct the headwall on the riverbank.

The use of a cofferdam during the construction will significantly reduce the time during which the riverbank and riverbed will be disturbed. The installation and removal of the cofferdam over a short period of time will ensure that any effect relating to elevated concentrations of suspended solids arising from the disturbance of the riverbed will be brief.

These works will require instream works and will be carried out in line with Inland Fisheries Ireland (2016) – Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters. Inland Fisheries Ireland. These instream works will be carried out between July and September with a dry working area being created using a sheet-piled cofferdam to allow for construction within the river. The works area will be dewatered using a pump and the water will be discharged to the adjacent grassland. The flow in the river will continue around the installed cofferdam. The proposed works shall only take place during favourable dry weather conditions. All material will be stockpiled as far from the riverbank as practicable and will be covered during the construction phase to avoid sediment entrainment in surface water runoff.

Prior to the Construction Phase, an CEMP will be agreed with both the NPWS and IFI to ensure that the requirements of both bodies are satisfied in advance of any works being undertaken.

Furthermore, IE Consulting completed a Hydrodynamic Assessment of the Proposed Outfall Pipe and Headwall to assess and quantify the potential short-term (construction stage) impacts to the existing hydrodynamic and hydrological regime of the River Barrow. Modelling revealed that the proposed outfall pipe and headwall are not predicted to result in an adverse impact to the existing baseline water levels and flow velocities. The assessment recommended that the sheet piling used in the construction is to be built to a level of 46.25m which is 0.68m above the 50% AEP plus Climate Change (1 in 2 year flood event plus climate change) and 2.52m above the 5%tile plus climate change fluvial flood level. The assessment also includes the following additional mitigation for the construction phase:

- The contractor shall ultimately determine the level of exceedance they deem to be acceptable. They must also consider the time required to remove the equipment from the channel if a flood event requires that the works are to be abandoned.
- It is recommended that a designated person monitors and records rainfall data from Met Éireann within the River Barrow catchment before construction and every 2 hours during constructions.
- Water levels immediately upstream of the proposed WwTP outfall will also be monitored and recorded before construction begins, and then every hour whilst construction is ongoing.

4.3.1.8 Mitigation Measures for Micro Tunnelling

- The works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance;
- Before any ground works are undertaken, silt fencing will be embedded into the local soils to ensure all site water is captured and filtered;
- The area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages;
- Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area. A closed-loop system will be used to reduce the overall waste by separating the spoil/returns from the fluid which can be recirculated and reused;
- Spills of drilling fluid will be cleaned up immediately and contained in an adequately sized skip before being taken off-site;
- If rainfall events occur during the works, there will be a requirement to collect and treat small volumes of surface water from areas of disturbed ground (i.e. soil and subsoil exposures created during site preparation works);
- This will be completed using a shallow swale and sump down slope of the disturbed ground; and water will be pumped to a proposed settlement pond area at least 50m from a watercourse;
- The discharge of water onto vegetated ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire percolation area will be enclosed by a perimeter of double silt fencing;
- Any sediment laden water from the works area will not be discharged directly to a watercourse or drain;
- Works shall be suspended in the event of an orange or red weather warning for rainfall;
- Daily monitoring of the compound works area, the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter is discharged to the watercourse;

- If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied;
- On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits will be carefully reinstated and re-seeded at the soonest opportunity to prevent soil erosion;
- There will be no batching of cement;
- All plant will be checked and inspected for purpose of use prior to mobilisation.

Fracture Blow-out (Frac-out) Prevention and Contingency Plan:

- The drilling fluid will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used);
- The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage;
- One or more lines of silt fencing will be placed between the works area and the adjacent river;
- Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility;
- Adequately sized skips will be used where temporary storage of arisings are required;
- The drilling process / pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;
- This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped;
- Any frac-out material will be contained and removed off-site;
- The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and,
- If the risk of further frac-out is high, a new drilling alignment will be sought.

4.3.1.9 Mitigation Measures for Protected Areas

Even in the absence of mitigation measures the Proposed Development is considered to have a long term positive effect on local water quality due to the efficient operation of the upgraded WwTP. There is the potential for short-term negative effects on surface water quality during construction, however, these effects will be of a short duration and will be limited given the volume of water within the River Barrow. Nevertheless, detailed, tried and tested, best practice mitigation measures for the protection of surface and groundwater quality during the construction phase will ensure that there is no significant negative effect on the River Barrow and River Nore SAC and other downstream designated sites. With respect to the mitigation measures:

- Mitigation measures for sediment control are detailed in Section 4.3.1.1 and 4.3.1.2.
- Mitigation measures for the control of hydrocarbons during construction works are detailed in Section 4.3.1.3.
- Mitigation measures for the control of cement-based products during construction works are detailed in Section 4.3.1.4.
- Mitigation measures in relation to wastewater are prescribed in Section 4.3.1.5.
- Mitigation measures in relation to the construction of the new outfall are prescribed in Section 4.3.1.7.
- Mitigation measures in relation to micro tunnelling are detailed in Section 4.3.1.8.
- Implementation of these mitigation measures will ensure the protection of surface water quality in receiving waters.

4.3.2 Operational Phase

4.3.2.1 Mitigation Measures against Effluent Discharge on Surface Water Quality

Emission Limit Value (EVL) requirements calculations and assimilative capacity assessments were carried out by Uisce Éireann as part of the plant design. The purpose of carrying out ELV

calculations was to determine the effluent discharge conditions required for the receiving watercourse to meet "Good" status as per guidelines specified by the Water Framework Directive (WFD).

By adhering to the ELVs as calculated, it can be ensured that the quality of the receiving river water body downstream of the discharge point will meet the necessary standard for the River Barrow to maintain at least "Good" status under the WFD and Surface Water Regulations, following mitigation of the current pressures on upstream water quality which cause the status of the River Barrow to be less than "Good" upstream of the discharge point.

As the increase in flows will be within the maximum permit limits and standards, there is no need to appraise the impacts of water quality as these impacts were considered during the ELV assessment and hence plant design.

Given the high level of treatment of the proposed upgraded WwTP, the overall impact of the proposed discharge will be imperceptible. Mitigation has been provided by design and as such no further mitigation is required, other than appropriate monitoring and maintenance of the operation of the WwTP.

The Proposed Development will also operate under discharge licence conditions which include:

- Complying with the Emission Limit Values (ELVs) and ensuring that no specified discharge from the wastewater works exceed these ELVs;
- Ensuring that there is no deterioration in the quality of the receiving waters as a result of the discharge;
- Ongoing maintenance of all plant and equipment to ensure that no unauthorised wastewater discharge takes place;
- Continued sampling, analyses and measurement of key water quality parameters in the discharged effluent;
- Continued sampling, analyses and measurement of key water quality parameters in the ambient environment (i.e. River Barrow upstream and downstream of the Proposed Development Site);
- Ongoing maintenance and calibration of all instrumentation;
- Maintain corrective action procedures and undertake corrective action in the unlikely event that the specific requirements of the licence not be fulfilled;
- Continued monitoring of the influent stream in order to measure mass loadings to the WwTP;
- In the case of an incident the EPA will be notified as soon as practicable and where the incident relates to discharge to water the Inland Fisheries Ireland (IFI) will be notified; and,
- All complaints of an environmental nature will be recorded.

No additional mitigation measures beyond those outlined in the discharge licence are deemed necessary.

4.3.2.2 Mitigation Measures to Effluent Discharge on Surface Water Quality

During this time all on-site procedures will be completed under licence from the EPA with IW reporting to the EPA until the discharge licence is surrendered. No additional mitigation measures beyond those outlined in the discharge licence are deemed necessary.

4.3.2.3 Mitigation Measures to Leaks or Plant Failure

During the operational phase of the proposed development the facility will continue to operate under the discharge licence conditions. All incidents, or failures will be reported to the EPA and dealt with in accordance with best practice UÉ guidelines.

4.3.2.4 Mitigation Measures against the Replacement of Natural Surfaces with Lower Permeability Surfaces

The drainage design for the Proposed Development includes the capture of any surface water runoff and recharge of this water back to ground. This will replicate the current hydrological/hydrogeological regime at the Proposed Development Site. In doing so, all rainfall which falls on the site will still infiltrate to ground and there will be no net increase in surface water runoff.

No additional mitigation measures are required.

4.3.2.5 Mitigation for Protected Areas

The WwTP has been designed with ELV calculated to ensure that the discharge of treated effluent will not have an impact the ability of the receiving watercourse to achieve “Good” status as per guidelines specified by the Water Framework Directive (WFD), following mitigation of upstream pressures on water quality.

Given the high level of treatment of the proposed upgraded WwTP, the overall impact of the proposed discharge will be imperceptible. Therefore, there will be no potential for effects on water quality within the SAC adjacent to the outfall location or any other downstream designated site.

4.3.3 Potential Effects with the Implementation of Mitigation

In all instances, the mitigation measures described in **Section 4.3** are sufficient to meet the WFD Objectives. The assessment of WFD elements for the WFD waterbodies is summarised in **Table I** below.

Table I: Summary of WFD Status for Unmitigated and Mitigated Scenarios

WFD Waterbody	WFD Code	WFD Status (2019-2024)	Assessed Potential Status Change- Unmitigated	Assessed Potential Status Change
Surface Water Bodies				
Barrow_160	IE_SE_14B012600	Moderate	Moderate	Moderate
Barrow_170	IE_SE_14B012600	Moderate	Moderate	Moderate
Groundwater Body				
Athy-Bagnelstown Gravels	IE_SE_G_160	Good	Good	Good
Bagenalstown Lower GWB	IE_SE_G_157	Good	Good	Good

4.4 CUMULATIVE EFFECTS

Indirect cumulative effects can occur with the Proposed Development and other developments via surface water and groundwater flowpaths, but these are restricted by connectivity and proximity.

A screening assessment has been completed on other projects and developments using connectivity for hydrology and groundwater flow directions and proximity for hydrogeology.

Given the nature of the Proposed Development consisting of a direct discharge of effluent to the River Barrow and the Proposed Development Sites proximity to the River Barrow, the

primary potential for cumulative effects will be from interactions with other activities within the Barrow River catchment which can affect surface water quality and surface water quantity.

The assessment of cumulative effects is divided as follows:

- Cumulative effect assessment with other wastewater treatment plants within the Barrow Catchment;
- Cumulative effect assessment with existing IPC Licences; and,
- Cumulative effect assessment with other land uses within the Barrow Catchment.

4.4.1 Cumulative Effects with other Urban Wastewater Treatment Plants

Urban wastewater treatment plants (urban WwTPs) located both upstream and downstream of the Proposed Development Site within the Barrow Catchment are presented in **Table J** below.

The Proposed Development has the potential to interact with the discharges from other urban WwTPs upstream and downstream of the Proposed Development Site.

The 3rd Cycle Barrow Catchment Report (EPA, 2024) states that Urban WwTPs are a significant pressure in 15 at risk waterbodies. None of these at risk SWBs are located downstream of the Proposed Development Site.

Table J: WwTPs listed as significant pressures in at risk waterbodies

Facility Name	At risk waterbody	4 th WFD Cycle Status
Portarlinton D0158	Barrow_080	Moderate
Portlaoise D0001	Triogue_020	Poor
Daingean D0226	Daingean_020	Poor
Mountmellick D0152	Owenass_020	Moderate
Coill Dubh D0242	Slate_020	Poor
Rathangan D0175	Slate_070	Moderate
Derrinturn D0244	Figile_010	Poor
Nurney A0080	Ballynaboley Stream_010	Poor
Monasterevin D0177	Barrow_100	Moderate
Tinryland WWTP A0099	Burren_050	Moderate
Ballinkillen WWTP A0094	Black(Borris)_020	Good
Cloneygowan A0167	Cushina_020	Good
Kileen A0153	Douglas(Laois)_030	Good
Coolanagh A0136	Douglas(Laois)_030	Good
Ballitore A0129	Greese_030	Moderate
Castleroe West A0127	Greese_060	Moderate

Furthermore, the EPA (EPA, 2021) states that five previously impacted waterbodies are no longer at risk from urban wastewater pressures with the following agglomerations no longer being considered as pressures since Cycle 2:

- Athy (D0003)
- Borris (D0248)
- Stradbally (D0292)
- Goresbridge (D0529)
- Muinebheag and Leighlinbridge (D0090)
- Old Leighlin (A0096)

Several of these agglomerations (Borris, Goresbridge, Muinebheag and Leighlinbridge) are located downstream of the Proposed Development Site. Therefore, the treatment of urban wastewaters downstream of the Proposed Development Site is improving and there is an associated improvement in water quality in the Barrow River. The proposed upgrade works will likely contribute to further improvements in surface water quality.

4.4.2 Cumulative Effects with IPC Licence Emissions

The Proposed Development Site is located in the Barrow River catchment and Table K lists all active IPC licences in the Barrow catchment directly upstream and downstream on the Proposed Development Site.

Effluent discharged from the Proposed Development may interact with industrial emissions. Cumulative effects may include elevated concentrations of suspended solids and nutrients (ammonia and orthophosphate) in the River Barrow and an associated deterioration in surface water quality.

There is only 1 no. active IPC licence located within 10km of the Proposed Development. Approximately 2.4km to the northeast the Irish Sugar Company are operating under IPC licence conditions (Licence No: P0222). All emissions to surface waters are treated and monitored to ensure that the industrial activities do not impact the local water quality. With the ongoing mitigation measures designed for the protection of surface waters under the IPC Licence no cumulative effects will occur.

All other IPC licences in the River Barrow catchment are significant distances (>15km) from the Proposed Development and due to the large volumes of flow within the Barrow River, no cumulative effects will occur.

No cumulative impacts on hydrogeology will occur due to the local hydrology with groundwater discharging as baseflow into the Barrow River. Therefore, cumulative effects on groundwater are negligible.

Table K: IPC Licences within the Barrow Catchment

Active IPC Licence No:	Name	Category	~Distance from the Proposed Development Site
P0261	Peerless Rug Europe	Industry (emissions to sewer)	~18km NW and upstream of the Proposed Development Site
P0222	Irish Sugar Limited (Carlow)	Industry (emissions to water)	~2.4km NE and upstream of the Proposed Development Site
P0555	Alltech Farming Solutions Ltd	Industry (emissions to water)	~23km S and downstream of the Proposed Development Site

4.4.3 Cumulative Effects Associated with the Wider Landuse in the Barrow Catchment

The Proposed Development Site lies within the largely agricultural River Barrow surface water catchment, and any discharge has the potential to interact with the agricultural practices in the surrounding lands and could contribute to a deterioration of downstream surface water quality.

Agriculture is the most significant pressure on river waterbodies in the Barrow Catchment. Common issues in relation to agriculture relate to diffuse phosphorous loss to surface waters from runoff from yards, roadways or other compacted surfaces or runoff from poorly draining soils. The entrainment of sediment in surface watercourses is also a problem which results from land drainage works and bank erosion.

Any discharge/effluent being released into the River Barrow has the potential to interact with the agricultural facilities and could contribute to a deterioration of downstream surface water quality.

However, the River Barrow already receives discharge from Mortarstown WwTP. Surface water quality monitoring completed in accordance with discharge licence requirements does not show a significant change in water quality upstream and downstream of the discharge location. The current discharge is having no impact on water quality in the river.

The WAC assessment proves the ability of the River Barrow to receive this treated wastewater without deleterious effects and without damaging aquatic life and ecosystems. Therefore no cumulative effects will occur with agricultural activities in the Barrow Catchment.

5. WFD ASSESSMENT CONCLUSION

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

The quantitative status of the underlying groundwater body (i.e., the available quantity (volume) of groundwater) will remain unaltered during the construction and operational phase of the Proposed Development. The temporary dewatering required during the construction phase will only result in short-term, temporary effects which will not impact the WFD status of the Athy-Bagenelstown Gravels GWB. During the operational phase, the existing potable water supply to the WwTP will be retained.

The Proposed Development is underlain by the Athy-Bagenelstown Gravels and Bagenelstown Lower GWBs. Due to the scale of the Proposed Development in comparison to the overall scale of the underlying GWB, there is no potential for a change in the qualitative status of the underlying GWB. Nevertheless, mitigation measures for the protection of groundwater quality will be implemented during the construction and operation phases of the Proposed Development.

The Proposed Development will involve a direct discharge of treated wastewater to the River Barrow. However, the discharge will comply with Emission Limit Values (ELV) which have been set following assimilation capacity assessments as part of the plant design. Compliance with the discharge conditions will ensure that the Proposed Development does not impact the ability of the receiving surface waterbody to achieve 'Good' status.

Furthermore, mitigation for the protection of surface water during the construction and operation phases of the Proposed Development will ensure the qualitative status of the receiving waters will not be altered by the Proposed Development.

There will be no change in GWB or SWB status in the underlying GWB or downstream SWBs resulting from the Proposed Development. There will be no change in quantitative (volume) or qualitative (chemical) status, and the underlying GWB and downstream SWBs are protected from any potential deterioration.

As such, the Proposed Development will not impact upon any surface water or groundwater body as it will not cause a deterioration of the status of the body and/or it will not jeopardise the attainment of good status.

As such, the Proposed Development:

- will not cause a deterioration in the status of all surface and groundwater bodies assessed;
- will not jeopardise the objectives to achieve 'Good' surface water/groundwater status;
- does not jeopardise the attainment of 'Good' surface water/groundwater chemical status;
- does not jeopardise the attainment of 'Good' surface water/groundwater quantity status;
- does not permanently exclude or compromise the achievement of the objectives of the WFD in other waterbodies within the same river basin district;
- is compliant with the requirements of the Water Framework Directive (2000/60/EC); and,
- is 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 8.1.4 of the EIAR).

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