



Trinity
Consultants

awnconsulting

Water Framework Directive Assessment

Project Title: Gas to Bord na Móna, Edenderry

CLIENT

Gas Network Ireland

DOCUMENT REFERENCE

247501.0163WR01



DATE

30 April 2026

DOCUMENT CONTROL SHEET

Document Control Sheet	
Our Reference	247501.0163WR01
Original Issue Date	30 April 2026
Client:	Gas Network Ireland
Client Address:	St Margaret's Rd, Finglas, Dublin

Revision	Revision Date	Description

Details	Written by	Approved by
Signature		
Name	Luke Maguire	Marcelo Allende
Title	Environmental Consultant	Principal Hydrological Consultant
Date	30 April 2026	

Disclaimer

This report considers the specific instructions and requirements of our client. It is not intended for third-party use or reliance, and no responsibility is accepted for any third party. The provisions in this report apply solely to this project and should not be assumed applicable to other developments without review and modification.



TABLE OF CONTENTS

1. INTRODUCTION	1
1.1 Background.....	1
1.2 Experience of Authors / Statement of Competency.....	1
1.3 Source of Information.....	2
1.4 Site Setting and WFD General Screening.....	3
1.5 Legislation and Guidance	4
1.6 Methodology	4
1.6.1 WFD Risk Status.....	5
1.6.2 WFD Water Body Status	5
1.6.3 Surface Water No Deterioration Assessment	5
1.6.4 Groundwater No Deterioration Assessment.....	6
1.6.5 Assessment against Future Status Objectives.....	7
2. DESCRIPTION OF HYDROLOGICAL AND HYDROGEOLOGICAL ENVIRONMENT	8
2.1 Hydrology	8
2.1.1 Regional Hydrological Environment.....	8
2.1.2 Hydrological Features and Corresponding / Respective Surface Water Quality	9
2.1.3 Local Hydrological Environment and Surface Water Quality.....	10
2.1.4 Areas of Conservation.....	15
2.1.5 Bathing Waters and Recreational Waterbodies	16
2.1.6 Water Supplies.....	17
2.2 Hydrogeology.....	17
2.2.1 Aquifer Classification, Characteristics, Groundwater Flow and Vulnerability.....	17
2.2.2 Groundwater Supply / Resources.....	21
3. WATERBODIES IDENTIFICATION AND STATUS	23
3.1 The Boyne_040 WFD River Waterbody.....	24
3.2 The Boyne_030 WFD River Waterbody.....	25
3.3 The YELLOW (CASTLEJORDAN)_030 WFD River Waterbody	26
3.4 The Boyne_020 WFD River Waterbody.....	27
3.5 The Figile_030 WFD River Waterbody.....	28
3.6 The Athboy WFD Groundwater Body	30
3.7 The Kilrathmurry Gravels WFD Groundwater Body	31
3.8 The Trim WFD Groundwater Body	32
3.9 The Rhodes WFD Groundwater Body (GWB)	33
3.10 The Cushina WFD Groundwater Body.....	34
4. DESCRIPTION OF THE PROPOSED DEVELOPMENT	35
4.1 Construction Phase	35
4.2 Operational Phase.....	39
5. ASSESSMENT OF SOURCE-PATHWAY-RECEPTOR (SPR) MODEL	40
5.1 Hydrological Connectivity / Pathways	41
5.2 Hydrogeological Connectivity / Pathways.....	42
6. NO-DETERIORATION ASSESSMENT	48
6.1 Hydrological Environment.....	48
6.2 Hydrogeological Environment	49
6.3 Assessment in Terms of Future Good Status	50
7. CONCLUSIONS	51

APPENDIX A. WFD ASSESSMENT MATRIX	52
APPENDIX B. NON-DETERIORATION ASSESSMENT	56

LIST OF FIGURES

Figure 2-1 Designated Areas (SAC, SPA, pNHA) & Hydrological Pathway Connections/Linkages (NPWS/EPA, 2026)	16
Figure 3-1. Surface Water Quality 2019-2024 for the Boyne_040 WFD River Waterbody (Catchments.ie, 2025)	25
Figure 3-2. Surface Water Quality 2019-2024 for the Boyne_030 WFD River Waterbody (Catchments.ie, 2025)	26
Figure 3-3. Surface Water Quality 2019-2024 for the YELLOW (CASTLEJORDAN)_030 WFD River Waterbody (Catchments.ie, 2025)	27
Figure 3-4. Surface Water Quality 2019-2024 for the Boyne_020 WFD River Waterbody (Catchments.ie, 2025)	28
Figure 3-5. Surface Water Quality 2019-2024 for the Figile_030 WFD River Waterbody (Catchments.ie, 2025)	29
Figure 3-6. Groundwater Quality 2019-2024 for Athboy Groundwater Body (Catchments.ie, 2025)	30
Figure 3-7. Groundwater Quality 2019-2024 for Kilrathmurry Gravels Groundwater Body (Catchments.ie, 2025)	31
Figure 3-8. Groundwater Quality 2019-2024 for Trim Groundwater Body (Catchments.ie, 2025)	32
Figure 3-9. Groundwater Quality 2019-2024 for Rhode Groundwater Body (Catchments.ie, 2025)	33
Figure 3-10. Groundwater Quality 2019-2024 for Cushina Groundwater Body (Catchments.ie, 2025)	34

LIST OF TABLES

Table 1-1 Structured Sections to describe the Proposed Development	3
Table 1-2. Surface Water Assessment Matrix	6
Table 1-3 Groundwater Assessment Matrix	6
Table 2-1 EPA Rivers Traversing the Proposed Pipeline	9
Table 2-2 Mapped & Named EPA Watercourse Traversing Pipeline Section 1	10
Table 2-3 Unmapped & Unnamed Watercourses Traversing Pipeline Section 1	10
Table 2-4. EPA/WFD River Waterbodies traversing chainage Section 1 of the pipeline route (EPA, 2025)	11
Table 2-5 Mapped & Named EPA Watercourse Traversing Pipeline Section 2	11
Table 2-6 Unmapped & Unnamed Watercourses Traversing Pipeline Section 2	11
Table 2-7 EPA/WFD River Waterbodies traversing chainage Section 2 of the pipeline route (EPA, 2025)	11
Table 2-8 Mapped and Named EPA Watercourses Traversing Pipeline Section 3	11
Table 2-9 Unmapped & Unnamed Watercourses Traversing Pipeline Section 3	12
Table 2-10 EPA/WFD River Waterbodies traversing chainage Section 3 of the pipeline route (EPA, 2025)	12
Table 2-11 Mapped & Named EPA Watercourse Traversing Pipeline Section 4	12
Table 2-12 Unmapped & Unnamed EPA Watercourse Traversing Pipeline Section 4	12
Table 2-13. EPA/WFD River Waterbodies traversing chainage Section 4 of the pipeline route (EPA, 2025)	13
Table 2-14 Mapped & Named EPA Watercourse Traversing Pipeline Section 5	13
Table 2-15 Unmapped & Unnamed EPA Watercourse Traversing Pipeline Section 5	13
Table 2-16 EPA/WFD River Waterbodies traversing chainage Section 5 of the pipeline route (EPA, 2025)	13
Table 2-17 Mapped & Named EPA Watercourse Traversing Pipeline Section 6	14
Table 2-18 Unmapped & Unnamed EPA Watercourse Traversing Pipeline Section 6	14
Table 2-19 EPA/WFD River Waterbodies traversing chainage Section 6 of the pipeline route (EPA, 2025)	14
Table 3-1. WFD Waterbodies relevant to the Study Area	23

Table 4-1 GNI143 Ballykilleen Pipeline River Crossing Methodology	35
Table 4-2 GNI143 Ballykilleen Pipeline Watercourse Crossing Methodology	35
Table 5-1 Pollutant Linkage (S-P-R) Assessment	45

1. INTRODUCTION

1.1 Background

AWN Consulting Limited (AWN) has prepared this Water Framework Directive (WFD) Screening Assessment to support the competent authority, in determining if there is a likelihood of significant effects on the Water Framework Directive status of the receiving waterbodies as a result of the proposed development. A full description of the proposed development is provided in Chapter 2 of the EIAR, Project Description. In summary, the Proposed Development, comprises the construction, commissioning, and operation of the c. 23.65-kilometre (km) GNI 143 Ballykilleen Pipeline and all ancillary and associated temporary works. The proposed GNI 143 Ballykilleen Pipeline is designed to connect the existing BGE77 pipeline (also known as Pipeline to the West (PTTW)) to the Edenderry Renewable Energy Complex. This WFD Assessment has been prepared in response to the requirements of the Water Framework Directive 2000/60/EC This WFD compliance document should be read in conjunction with Chapter 6 of the Environmental Impact Assessment Report (EIAR).

The objective of the assessment is to address the following:

- ▶ Does the development cause deterioration of a water body from its current status or potential for reaching "Good" status?
- ▶ Does the development impact on any water dependent protected areas, priority species, habitats etc.?
- ▶ Does the development support the achievement of water body objectives and programme of measures?

The surface water assessment and groundwater assessment both examine the potential effects of the proposed development, which includes the construction and operation of the proposed development.

1.2 Experience of Authors / Statement of Competency

This assessment has been prepared by Luke Maguire and Marcelo Allende.

Luke Maguire (B.Sc); is an Environmental Consultant at AWN with over 5 years of experience in Environmental Consulting and water resources. Luke holds a B.Sc. in Geoscience from Trinity College University of Dublin and has worked on a range of developments including large Residential developments, pharmaceutical plants, medical device facilities, ICT facilities and energy projects. Luke has experience in contaminated soil analysis, basement impact assessments, bulk excavations and largescale dewatering processes. Additionally, Luke has gained experience in Environmental Impact Assessment (EIAR), stage 1 & 2 Flood Risk Assessments, Hydrological & Hydrogeological Risk Assessment, and WFD Assessment Reporting and has worked in multiple Environmental monitoring disciplines such as Chemical Wastewater, Ground Gas, Surface Water, and Groundwater Monitoring at numerous sites across Dublin.

Marcelo Allende is a Principal Environmental Consultant (Hydrologist) with AWN Consulting with over 20 years of experience in water resources technical studies, conceptual and numerical hydrological/hydrogeological modelling and environmental consultancy. Marcelo holds a degree in Water Resource Civil Engineering (BEng, Hons) from the University of Chile and a Bachelor of Science in Engineering (BSc, Hons). He has worked on a wide of range of projects including multi-aspect environmental investigations, geo-environmental impact assessments, surface and groundwater resource management, hydrological and hydrogeological conceptual and numerical modelling, strategic and site specific flood risk assessments (Stage 1,2 and 3), Due Diligence reporting, baselines studies, soils, surface water and groundwater monitoring and field sampling programmes on a variety of brownfield and greenfield sites throughout Ireland as well as overseas in Chile, Argentina, Peru and Panama. He also has detailed knowledge of environmental guidance, legislation, regulations & standards and expertise in GIS

(expert level) and MATTE studies at COMAH establishments. He is currently a member of the International Association of Hydrogeologists (IAH, Irish Group) and a member of Engineers Ireland (MIEI).

1.3 Source of Information

Desk-based hydrological and hydrogeological information in the vicinity of the site was obtained through accessing databases and other archives where available. Data was sourced from the following:

- ▶ Geological Survey of Ireland- online mapping (GSI, 2025).
- ▶ GSI - Geological Heritage Sites & Sites of Special Scientific Interest.
- ▶ Ordnance Survey of Ireland (OSI).
- ▶ Teagasc subsoil database.
- ▶ National Parks and Wildlife services (NPWS, 2025).
- ▶ Environmental Protection Agency (EPA) – website mapping and database information. Envision water quality monitoring data for watercourses in the area.
- ▶ WFD Cycle 3 HA 07 Boyne Catchment Report (EPA, May 2024), River Basin Management Plan for Ireland 2018-2021.
- ▶ WFD Cycle 2 Boyne_SC_030 Sub-Catchment Assessment Report (EPA, December 2018)
- ▶ WFD Cycle 3 HA 14 Barrow Catchment Report (EPA, May 2024)
- ▶ WFD Cycle 2 Figile_SC_010 Sub-Catchment Assessment Report (EPA, December 2018)
- ▶ River Basin Management Plan for Ireland 2018-2021.
- ▶ The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW)).
- ▶ Office of Public Works (OPW) flood mapping data (www.floodmaps.ie)
- ▶ South Dublin City Council (2005), Greater Dublin Strategic Drainage Study: Technical Documents of Regional Drainage Policies. Dublin: Dublin City Council.
- ▶ 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001).
- ▶ Water Action Plan 2024 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024).
- ▶ The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW)).
- ▶ Office of Public Works (OPW) flood mapping data (www.floodmaps.ie).

Site specific data was derived from the following sources:

- ▶ Flood Risk Assessment (FRA). Edenderry Gas Pipeline JBA, (2025).
- ▶ Gas to Bord na Mona, Edenderry Construction Methodology. Fingleton White (2025).
- ▶ Site Investigation- Gas to Bord na Mona Power Station at Edenderry, Co.Offaly. IGSL Ltd Ltd (2025);
- ▶ Construction Environmental Management Plan. Gas to Bord na Mona, Edenderry. AWN Consulting (2025);
- ▶ The proposed development design site plans and drawings; and Consultation with the project design engineers.
- ▶ Various design site plans and drawings, as submitted with this planning application.
- ▶ EPA (2025). EPA Map Viewer (accessed in November/December 2025).
- ▶ GSI (2025). GSI Map Viewer (accessed in November/December 2025).

Relevant legislation and guidance is as follows:

- ▶ European Communities 920030, Common Implementation Strategy for the Water Framework Directives (2000/60/EC) Guidance Document No.2.
- ▶ EPA (May 2015), An approach to characterisation as part of the Water Framework Directive V2 revised.
- ▶ EPA (2010) Methodology for Establishing Groundwater Threshold Values, the Assessment of Chemical and Quantitative Status for Groundwater and Groundwater Trends.

- ▶ Common Implementation Strategy (CIS) (2017) Guidance Document No. 36 'Exemptions to the environmental objectives according to Article 4(7) provides comprehensive guidance on the application of Article 4(7).
- ▶ Joint Assistance to Support Projects in European Regions (JASPERS) (2018) Water Framework Directive Project assessment checklist tool.
- ▶ UKTAG (2012) Groundwater Chemical Classification for the Water Framework Directive. Paper 11b(i).
- ▶ UK Technical Advisory Group on the Water Framework Directive.
- ▶ UKTAG (2012) Groundwater Quantitative Classification for the Water Framework Directive. Paper 11b(ii), UK Technical Advisory Group on the Water Framework Directive.
- ▶ Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001).
- ▶ CIRIA C648 Control of Water Pollution from Constructional Sites.
- ▶ Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (NRA 2008); and
- ▶ Inland Fisheries Ireland (IFI) – A Guideline on Planning for Watercourses in the Urban Environment.

This WFD assessment was based on desktop review of the Environmental Protection agency (EPA) and Local Authority Waters Programme water quality records which were obtained from the portal www.catchments.ie (accessed in September 2025). From the aforementioned source of information, the WFD Status classification and Risk score were obtained for the identified water bodies.

The River Waterbody Status have been estimated in accordance with European Communities (Water Policy) Regulations 2003 (SI No. 722/2003), as amended. The regulation objectives include the attainment of good status in waterbodies that are of lesser status at present and retaining good status or better where such status exists.

1.4 Site Setting and WFD General Screening

From the Offtake Installation located in Kilwarden Co. Meath, the pipeline routes south, cross country, through counties Meath and Offaly, and terminates at the new Ballykilleen AGI located within the Edenderry Power Station development site. The route includes several special crossings, notably the Kilwarden River, the Yellow River, M4 motorway, and the Grand Canal.

The current land use is largely agricultural lands, with the exception of multiple roads which the gas transmission pipeline route traverses along its extent. The site extends primarily across greenfield land characterised by a predominant agricultural function or land use.

Given the linear nature of the development, the pipeline has been divided into six sections solely for the purposes of describing the Proposed Development. These sections have been defined on a practical basis, using intervals and identifiable landmark features or crossings along the route. The segmentation does not reflect any environmental or construction rationale, it provides a structure for presenting information of the Proposed Development. Where relevant, this framework also assists in focusing the environmental assessment on specific localised elements of the route. The six sections, defined by key crossing points and chainages along the proposed alignment, are outlined in Table 1-1

Table 1-1 Structured Sections to describe the Proposed Development

Pipeline Section	Start Point (m)	End Point (m)	Length (m)
Pipeline Section 1: Kilwarden Offtake Installation to the L40181 Road (RDX05)	0	3,931	3,931
Pipeline Section 2: L40181 Road (RDX05) to the L4091 (RDX09)	3,931	7,441	3,510
Pipeline Section 3: L4091 Road (RDX09) to the Yellow River (RVX02)	7,441	11,669	4,228

Pipeline Section 4: Yellow River (RVX02) to the R441 (RDX12)	11,669	15,348	3,679
Pipeline Section 5: R441 (RDX12) to the L5003 (RDX15)	15,348	19,494	4,146
Pipeline Section 6: L5003 (RDX15) to the Ballykilleen AGI	19,494	23,650	4,156
GNI 143 Ballykilleen Pipeline	0	23,650	23,650

1.5 Legislation and Guidance

The Water Framework Directive (WFD) 2000/60/EC aims to protect and enhance the quality of the water environment (both surface water and groundwater) across all European Union member states. The WFD was transposed into Irish law by the European Communities (Water Policy) regulations 2003 (S.I. No 722 of 2003). The WFD requires that EU Member States achieve at least “Good” status for all water bodies by the year of 2027 at the latest. Additionally, where Member States assign “High” status objectives to water bodies, the “High” status must be achieved or maintained by 2027.

The concept of ‘deterioration of the status’ of a body of surface water in Article 4(1)(a)(i) of Directive 2000/60 is interpreted as meaning that there is deterioration as soon as the status of at least one of the quality elements, within the meaning of Annex V to the directive, falls by one class, even if that fall does not result in a fall in classification of the body of the surface water as a whole. However, if the quality element concerned, within the meaning of that annex, is already in the lowest class, any deterioration of that element constitutes a ‘deterioration of the status’ of a body of surface water, within the meaning of Article 4(1)(a)(i).

As part of the WFD implementation process the EPA completes a risk assessment and the outcomes are implemented through River Basin Management Plans (RBMPs) in six-year cycles. Ireland is currently in WFD third cycle 2022-2027 i.e. Water Action Plan 2024 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024). Waterbodies are either “At Risk” or “Not at Risk” of meeting WFD environmental objectives. Where a waterbody is “At Risk”, the EPA determines the significant pressures that are placing the water body at risk of meeting its status objective. This determination focuses the Programme of Measures for the relevant subcatchment(s).

The primary aim of the RBMP is that water bodies identified as being ‘At Risk’ of not achieving their WFD environmental objectives need to have targeted measures implemented to achieve objectives under this Plan. The EPA determines the significant pressures that are placing the water body at risk of meeting its status objective. This determination focuses the programme of Measures for the relevant subcatchment(s). The Water Action Plan 2024 has been reviewed in the context of ensuring mitigation measures comply with current and expected future measures required to be implemented for protection of water body status within the context of the proposed development.

As part of its role, the EPA and other stakeholders such as local authorities must consider whether proposals for new developments (other than where exemptions apply Article 4.4 - 4.7 of the WFD) have the potential to:

- ▶ Cause a deterioration of a water body from its current status or potential; and/ or
- ▶ Prevent future attainment of good status or potential where not already achieved.

As a result, new developments that have the potential to impact on current or predicted WFD status are required to assess their compliance against the WFD objectives of the potentially affected water bodies.

1.6 Methodology

This WFD assessment is based on desktop review of the Environmental Protection Agency (EPA) dataset which was obtained from the portal www.catchments.ie (accessed in December 2025).

The water bodies identified for this assessment are related to the vicinity of the proposed development and its direct or indirect hydrological or hydrogeological connection. From the aforementioned source of information, the WFD Status classification, and Risk score were obtained.

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

1.6.1 WFD Risk Status

The WFD Risk score is the risk for each waterbody of failing to meet their WFD objectives by 2027. The risk of not meeting WFD objectives has been determined by assessment of monitoring data, data on the pressures and data on the measures that have been implemented. Waterbodies that are At Risk are prioritised for implementation of measures. This assessment was completed in 2020 by the EPA Catchments Unit in conjunction with other public bodies and was primarily based on monitoring data up to the end of 2018.

The three risk categories are:

- ▶ Waterbodies that are 'At Risk' of not meeting their Water Framework Directive objectives. For these waterbodies an evidence-based process was undertaken to identify the significant pressures; once a pressure is designated as 'significant', measures and accompanying resources are needed to mitigate the impact(s) from this pressure. These 'At Risk' waterbodies require not only implementation of the existing measures described in the various regulations, e.g., the Good Agricultural Practices Regulations, but also in many instances more targeted supplementary measures.
- ▶ Waterbodies that are categorised as 'Review' either because additional information is needed to determine their status before resources and more targeted measures are initiated or the measures have been undertaken, e.g., a wastewater treatment plant upgrade, but the outcome hasn't yet been measured/monitored.
- ▶ Waterbodies that are 'Not at Risk' and therefore are meeting their Water Framework Directive objectives. These require maintenance of existing measures to protect the satisfactory status of the water bodies.

1.6.2 WFD Water Body Status

Surface water body status is classified by the EPA on the basis of chemical and ecological status or potential. This system is summarised in Appendix A Figure 1. Under the WFD, groundwater body status is classified on the basis of quantitative and chemical status. This system is summarised in Appendix A Figure 2.

1.6.3 Surface Water No Deterioration Assessment

Table 1-2 below presents the matrix used to assess the effect of the proposed development on surface water status or potential class. It ranges from a major beneficial effect (i.e., a positive change in overall WFD status) through no effect to deterioration in overall status class. The colour coding used in Table 1-2 is applied to the 'No Deterioration Assessment' spreadsheet provided in Appendix B of this report.

Table 1-2. Surface Water Assessment Matrix

Effect	Description/ Criteria	Outcome
Major Beneficial	Impacts that taken on their own or in combination with others have the potential to lead to the improvement in the ecological status or potential of a WFD quality element for the entire waterbody	Increase in status of one or more WFD element giving rise to a predicted rise in status class for that waterbody.
Minor/ localised beneficial	Impacts when taken on their own or in combination with others have the potential to lead to a minor localised or temporary improvement that does not affect the overall WFD status of the waterbody or any quality elements	Localised improvement, no change in status of WFD element
No Impact	No measurable change to any quality elements.	No change
Localised / temporary adverse effect	Impacts when taken on their own or in combination with others have the potential to lead to a minor localised or temporary deterioration that does not affect the overall WFD status of the waterbody or any quality elements. Consideration will be given to habitat creation measures.	Localised deterioration, no change in status of WFD element when balanced against mitigation measures embedded in the project.
Adverse effect on class of WFD element	Impacts when taken on their own or in combination with others have the potential to lead to the deterioration in the WFD status class of one or more biological quality elements, but not in the overall status of the waterbody. Consideration will be given to habitat creation measures.	Decrease in status of WFD element when balanced against positive measures embedded in the project.
Adverse effect on overall WFD class of waterbody	Impacts when taken on their own or in combination with others have the potential to lead to the deterioration in the ecological status or potential of a WFD quality element, which then lead to a deterioration of status/potential of waterbody.	Decrease in status of overall WFD waterbody status when balanced against positive measures embedded in the project.

1.6.4 Groundwater No Deterioration Assessment

Table 1-3 below presents the matrix used to assess the effect of the proposed development on groundwater status class. It ranges from a beneficial effect but no change in status to deterioration in overall status class. The colour coding used in Table 1-3 is applied to the final 'No Deterioration Assessment' spreadsheet in Appendix B of this report.

Table 1-3 Groundwater Assessment Matrix

Magnitude of Impact of the proposed development on WFD Element	Effect on WFD Element within the assessment boundary	Effect on Status of WFD element at the Groundwater Body Scale
Impacts lead to beneficial effect	Combined impacts have the potential to have a beneficial effect on the WFD element.	Improvement but no change to status of WFD element

Magnitude of Impact of the proposed development on WFD Element	Effect on WFD Element within the assessment boundary	Effect on Status of WFD element at the Groundwater Body Scale
No measurable change to groundwater levels or quality.	No measurable change to WFD elements.	No change and no deterioration in status of WFD element
Impacts when taken on their own have the potential to lead to a minor localised or temporary effect	Combined impacts have the potential to lead to a minor localised or temporary adverse effect on the WFD element.	Combined impacts have the potential to lead to a minor localised or temporary effect on the WFD element. No change to status of WFD element and no significant deterioration at groundwater body scale.
Impacts when taken on their own have the potential to lead to a widespread or prolonged effect.	Combined impacts have the potential to have an adverse effect on the WFD element.	Combined impacts have the potential to have an adverse effect on the WFD element, resulting in significant deterioration but no change in status class at groundwater body scale.
Impacts when taken on their own have the potential to lead to a significant effect.	Combined impacts in combination with others have the potential to have a significant adverse effect on the WFD element.	Combined impacts in combination with others have the potential to have an adverse effect on the WFD element AND change its status at the groundwater body scale

1.6.5 Assessment against Future Status Objectives

River Basin Management Plans are used to outline water body pressures and the actions that are required to address them. The future status objective assessment considers the ecological and chemical potential of a surface water body and the mitigation measures stated in the River Basin Management plans that defined the ecological and chemical potential. Assessments are based on the project (including mitigation measures) risks (construction and operation) with regard to the objectives for achieving good status as set out in the 3rd Cycle RBMP 2022-2027 i.e. Water Action Plan 2024. The assessment considers whether the proposed development has the potential to prevent the implementation or impact the effectiveness of the defined measures in these plans.

2. DESCRIPTION OF HYDROLOGICAL AND HYDROGEOLOGICAL ENVIRONMENT

2.1 Hydrology

2.1.1 Regional Hydrological Environment

The proposed development site is located within the former Eastern River Basin District (ERBD) (now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD).

According to the EPA mapping database, the proposed pipeline route (Site) extends across the 2 WFD Catchments. The entire northern and central portions of the site (Sections 1-5) are located within the Boyne Catchment which resides within Hydrometric Area 07(Catchment Id:07). The southernmost portion of the site (Section 6) is located within the Barrow Catchment which is situated within Hydrometric Area 14 (Catchment Id: 14).

According to the EPA maps, the Proposed Development pipeline route spans across 3 WFD subcatchment. The northern (section 1-2), central (Section 3-5) and southern portions (section 6) of the site lie within the Boyne_SC_030 Subcatchment, Boyne_SC_010 Subcatchment and Figile_SC_010 Subcatchment, respectively. The Temporary Construction Compound 03 is located within the Boyne_SC_010 WFD subcatchment and Temporary Construction Compound 04 is located within the Figile_SC_020 WFD Subcatchment (Refer to Volume 4 - Figure 6-3 Hydrological Environment and Figure 6-4 Compound Hydrological Environment Sheet included in this EIAR Application for the mapping of watercourses and WFD subcatchments which traverse the respective chainage sections of the route).

Upon review of the historical 6-inch first edition, 6-inch last edition and 25-inch Cassini map, no springs or river rise/sources were identified within or directly adjacent to the development site boundary.

The two main hydrological features of region include the River Boyne and River Figile.

2.1.1.1 River Boyne

The River Boyne rises from Trinity Well at Newberry Hall to the east of Carbury (Carbury Bog), County Kildare and flows approximately 112 km (70 miles) northeast through counties Offaly, Kildare, and Meath, prior to its' outfall into the Irish Sea between Mornington, County Meath, and Baltray, County Louth at the Boyne Estuary Plume Zone (EU Code: IE_EA_010_0000) coastal waterbody, c. 61km (linear distance) northeast of the site.

In relation to the proposed pipeline, the upper stage course of the River Boyne flows north through adjacent lands located to the east of section 3 and 4 of the proposed pipeline route and at its nearest point is located c. 110m east of Section 3 at RVX02, the river crossing which represents the pipelines intersection with the Yellow [Castlejordan] River.

2.1.1.2 River Figile

The Figile River in Ireland rises at the confluence of the Crabtree and Cushaling rivers near the Kildare-Offaly border. It flows primarily south through County Offaly, passing near Clonbulloge, before merging with the Slate and Cushina rivers, entering County Kildare, and draining into the River Barrow at Passlands, north of Monasterevin. The River Barrow subsequently merges/joins with the River Suir at Cheekpoint and ultimately outfalls to the Eastern Celtic Sea (EU Code: IE_SE_050_0000) coastal waterbody off the southeast coast of Ireland, c. 131km (linear distance) southeast of the site (refer to Section 6.3.2.3.6 below).

In relation to the proposed pipeline, the Ballyleaken and Ballykilleen Streams are secondary/tertiary tributaries to the River Figile. Both of these streams traverse the southern portion of the site (Section 6) and generally flow in a southerly direction before ultimately discharging to the River Figile c. 1.9km and 200m southeast of Section 6, respectively at the point of closest proximity. From here the River Figile subsequently flows south and outfalls to the River Nore & River Barrow SAC at a confluence point located approximately 16.1km south of the site (linear distance at the point of closest proximity).

2.1.2 Hydrological Features and Corresponding / Respective Surface Water Quality

The WFD requires 'Good Water Status' for all European waters to be achieved through a system of river basin management planning and extensive monitoring by 2015 or, at the least, by 2027. 'Good status' means both 'Good Ecological Status' and 'Good Chemical Status'. In 2009 the first River Basin Management Plan (RBMP) 2009-2015 was published. The second cycle river basin management plan was carried out between 2018-2021 with the previous management districts now merged into one Ireland River Basin District (Ireland RBD). The third cycle river basin management plan (2022-2027), i.e. Water Action Plan 2024 - A River Basin Management Plan for Ireland (Dept. of Housing Local Government & Heritage, Sept 2024) has since been published.

In accordance with the WFD, each river catchment within the former RBD was assessed by the EPA and a water management plan detailing the programme of measures was put in place for each. In addition to the biological assessment method outlined above the EPA also classified water bodies in accordance with the WFD water quality status. Rivers, lakes, estuaries and coastal waters can be awarded one of five statuses: High, Good, Moderate, Poor, Bad. Groundwater has just two statuses – Good and Poor.

The third cycle river basin management plan (2022-2027) i.e. "Water Action Plan 2024 - A River Basin Management Plan for Ireland" has been reviewed in the context of ensuring mitigation measures comply with current and expected future measures required to be implemented for protection of water body status within the context of the Proposed Development.

The current EPA watercourse mapping shows that the entire pipeline route is traversed by 30No. watercourses (comprise field drainage ditches / streams / canals) and 2No. rivers.

A distinction is made between rivers and watercourses based primarily on channel size, flow regime, and catchment scale. Rivers are defined as larger, permanent waterbodies with continuous flow, well-defined channels, and established riparian corridors that typically support more complex aquatic and riparian habitats. Watercourses, in contrast, refer to smaller drainage features such as streams, artificial drains, and field ditches, which may have intermittent or seasonal flow and more limited channel development.

Table 2-1 EPA Rivers Traversing the Proposed Pipeline

Section	EPA Waterbody Name	Order Class	Flow Direction	Outfall	Distance to Outfall
1	Kinnegad 07 / Kilwarden	River	Easterly	River Boyne	c. 5.3 km
	AGHNAGILLAGH	Stream	South Easterly	River Boyne	c. 3.5 km
2	KNOCKERSALLY or COLEHILL	Stream	Easterly	River Boyne	c. 1.6 km
	PARK 07	Stream	Easterly	River Boyne	c. 1.4 km
3	BALLYNAKIL 07	Stream	South	River Boyne	c. 1.0 km
	CASTLEJORDAN 07	Stream	Easterly	River Boyne	c. 0.6 km
	RAHIN	Stream	Easterly	CASTLEJORDAN 07 Stream	c. 180m
	Yellow [Castlejordan]	River	Easterly	River Boyne	c. 130m

4	ROOSK 07	Stream	Easterly	River Boyne	c. 1.5 km
5	MOUNTWILSON	Stream	Easterly	KINNAFAD Stream	c. 550m
	KINNAFAD	Stream	Easterly	River Boyne	c. 2.5 km
6	BALLYLEAKEN	Stream	South Easterly	Figile River	c. 3.1 km
	BALLYKILLEEN	Stream	South	Figile River	c. 200m

2.1.3 Local Hydrological Environment and Surface Water Quality

The site predominantly comprises portions of multiple fields with some internal and boundary hedgerows. Currently, there is no artificial drainage infrastructure within the site boundary currently. The site is characterised predominantly as greenfield grassland and hedgerow, therefore at present drainage is predominantly via overland flow to drainage ditches, streams and river watercourses which traverse / flow through / adjacent to the site boundary, coupled with drainage to ground whereby surface water and rainfall, is generally percolated to ground through the site via infiltration to grass and soil under the influence of gravity. Drainage along road crossings within the site typically involves overland flow to roadside ditches or gulleys.

Triturus Environmental Ltd. undertook biological water quality surveys that have been used to inform the baseline assessment of surface water quality for the EIAR. A total of 33 no. riverine survey sites were assessed using Q sampling in July 2025, in accordance with Environmental Protection Agency (EPA) methodology. The full results are provided in Appendix 7.5 (Aquatic baseline report for a proposed Gas Networks Ireland Gas Pipeline, Edenderry, Co. Offaly) of the EIAR.

In addition, targeted site walkover and vantage surveys were undertaken along the proposed development corridor and at key watercourse crossings to establish local drainage flow direction. This information was used in conjunction with desk-based data and inform the baseline understanding of surface water flow and connectivity.

2.1.3.1 Pipeline Section 1: Kilwarden Offtake Installation to the L40181 Road (RDX05)

According to the EPA (Catchments.ie, 2026), this section of the site is located within the Boyne_SC_030 subcatchment. The current EPA watercourse mapping indicates that Section 1 is traversed by 2No. rivers /watercourses (refer to Volume 4 Hydrological Environment Sheet 1 of 6).

Table 2-2 Mapped & Named EPA Watercourse Traversing Pipeline Section 1

EPA Waterbody Name	Water Crossing Reference	Order Class	Flow Direction	Outfall	Distance to Outfall (Linear)
Kinnegad 07 / Kilwarden	RVX01	River	Easterly	River Boyne	c. 5.3 km
AGHNAGILLAGH	WCX02	Stream	South East	River Boyne	c. 3.5 km

Table 2-3 Unmapped & Unnamed Watercourses Traversing Pipeline Section 1

Water Crossing Reference	Chainage/ ITM Coordinates	Inferred Flow Direction	River Q Values, Status*	Final Receptor
WCX01	1900	North-easterly	Q2-3, Poor	River Boyne

Note-*Refer to the Appendix 7.5 for the Aquatic Fisheries Report Baseline (2025)

Table 2-4. EPA/WFD River Waterbodies traversing chainage Section 1 of the pipeline route (EPA, 2025)

EPA Waterbody Name	WFD Waterbody Name	European Code	WFD Status (2021-2024)	WFD Risk Score (3rd Cycle)
Kinnegad 07 / Kilwarden River	Boyne_040	IE_EA_07B040600	Poor	At Risk
AGHNAGILLAGH Stream	Boyne_040	IE_EA_07B040600	Poor	At Risk

2.1.3.2 Pipeline Section 2: L40181 Road (RDX05) to the L4091 (RDX09)

According to the EPA (Catchments.ie, 2026), this section of the site is located within the Boyne_SC_030 subcatchment. At present, the EPA watercourse mapping indicates that Section 2 is traversed by 2 no. river /watercourses (refer to Volume 4 Hydrological Environment Sheet 2 of 6).

Table 2-5 Mapped & Named EPA Watercourse Traversing Pipeline Section 2

EPA Waterbody Name	Water Crossing Reference	Order Class	Flow Direction	Outfall	Distance to Outfall (Linear)
KNOCKERSALLY or COLEHILL Stream	WCX04	Stream	Southeast	River Boyne	c. 1.6 km
PARK 07 Stream	WCX05	Stream	Southeast	River Boyne	c. 1.2 km

Table 2-6 Unmapped & Unnamed Watercourses Traversing Pipeline Section 2

Water Crossing Reference	Chainage/ ITM Coordinates	Inferred Flow Direction	River Q Values, Status*	Final Receptor
WCX03	4893	southeast	Q2-3, Poor	River Boyne
WCX06	7496	south	N/A*	River Boyne

Note-*Refer to Appendix 7.5 of the EIAR for the Aquatic Fisheries Report Baseline (2025)

N/A*- Waterbody was not of fisheries or aquatic value given the dry nature of the channel, hence it was not possible to obtain a biological water quality sample.

Table 2-7 EPA/WFD River Waterbodies traversing chainage Section 2 of the pipeline route (EPA, 2025)

EPA Waterbody Name	WFD Waterbody Name	European Code	WFD Status (2021-2024)	WFD Risk Score (3rd Cycle)
KNOCKERSALLY or COLEHILL Stream	Boyne_030	IE_EA_07B040400	Good	Not At Risk
PARK 07 Stream	Boyne_030	IE_EA_07B040400	Good	Not At Risk

2.1.3.3 Pipeline Section 3: L4091 Road (RDX09) to the Yellow River (RVX02)

According to the EPA (Catchments.ie, 2026), this section of the pipeline is located within the Boyne_SC_010 subcatchment. At present, the EPA watercourse mapping indicates that Section 3 is traversed by 3 no. river /watercourses (refer to Volume 4 Hydrological Environment Sheet 3 of 6).

Table 2-8 Mapped and Named EPA Watercourses Traversing Pipeline Section 3

EPA Waterbody Name	Water Crossing Reference	Order Class	Flow Direction	Outfall	Distance to Outfall (Linear)
BALLYNAKIL 07 Stream	WCX06	Stream	South	River Boyne	c. 1.0 km

CASTLEJORDAN 07 Stream	WCX11	Stream	East	River Boyne	c. 0.7 km
RAHIN Stream	WCX12	Stream	Northeast	River Boyne	c. 0.65 km
Yellow [Castlejordan] Stream	RVX02	River	East	River Boyne	c. 0.1 km

Table 2-9 Unmapped & Unnamed Watercourses Traversing Pipeline Section 3

Water Crossing Reference	Chainage/ ITM Coordinates	Inferred Flow Direction	River Q Values, Status*	Final Receptor
WCX07	8030	South Easterly	Q2, Bad	River Boyne
WCX08	8815	South	Q2-3, Poor	River Boyne
WCX09	9278	South	Q2, Bad	River Boyne
WCX10	9603	South Easterly	Q2-3, Poor	River Boyne

Note-*Refer to Appendix 7.5 of the EIAR for the Aquatic Fisheries Report Baseline (2025)

Table 2-10 EPA/WFD River Waterbodies traversing chainage Section 3 of the pipeline route (EPA, 2025)

EPA Waterbody Name	WFD Waterbody Name	European Code	WFD Status (2021-2024)	WFD Risk Score (3rd Cycle)
BALLYNAKIL 07 Stream	Boyne_030	IE_EA_07B040400	Good	Not At Risk
CASTLEJORDAN 07 Stream	Boyne_030	IE_EA_07B040400	Good	Not At Risk
RAHIN Stream	Boyne_030	IE_EA_07B040400	Good	Not At Risk
Yellow [Castlejordan] Stream	YELLOW (CASTLEJORDAN)_030	IE_EA_07Y020300	Good	Not At Risk

2.1.3.4 Pipeline Section 4: Yellow River (RVX02) to the R441 (RDX12)

According to the EPA (Catchments.ie, 2026), this section of the pipeline is located within the Boyne_SC_010 subcatchment. At present, the EPA watercourse mapping indicates that Section 4 is traversed by 1 no. river waterbody (refer to Volume 4 Hydrological Environment Sheet 4 of 6).

Table 2-11 Mapped & Named EPA Watercourse Traversing Pipeline Section 4

EPA Waterbody Name	Water Crossing Reference	Order Class	Flow Direction	Outfall	Distance to Outfall
ROOSK 07 Stream	WCX16	Stream	East-northeast	River Boyne	c. 1.3 km

Table 2-12 Unmapped & Unnamed EPA Watercourse Traversing Pipeline Section 4

Water Crossing Reference	Chainage/ ITM Coordinates	Inferred Flow Direction	River Q Values, Status*	Final Receptor
WCX13	12916	East	Q3, Poor	River Boyne
WCX14	13124	East	Q3, Poor	River Boyne
WCX15	13376	Northeast	Q2-3, Poor	River Boyne

Note-*Refer to Appendix 7.5 of the EIAR for the Aquatic Fisheries Report Baseline (2025)

Table 2-13. EPA/WFD River Waterbodies traversing chainage Section 4 of the pipeline route (EPA, 2025)

EPA Waterbody Name	WFD Waterbody Name	European Code	WFD Status (2021-2024)	WFD Risk Score (3rd Cycle)
ROOSK 07 Stream	Boyne_030	IE_EA_07B040400	Good	Not At Risk

2.1.3.5 Pipeline Section 5: R441 (RDX12) to the L5003 (RDX15)

According to the EPA (Catchments.ie, 2026), this section of the pipeline is located within the Boyne_SC_010 subcatchment. Currently, the EPA watercourse mapping indicates that Section 4 is traversed by 2 no. river waterbodies (refer to Volume 4 Hydrological Environment Sheet 5 of 6).

Table 2-14 Mapped & Named EPA Watercourse Traversing Pipeline Section 5

EPA Waterbody Name	Water Crossing Reference	Order Class	Flow Direction	Outfall	Distance to Outfall (Linear)
MOUNTWILSON STREAM	N/A*	Stream	East	River Boyne	c. 2.2 km
KINNAFAD Stream	WCX19	Stream	Northeast	River Boyne	c. 2.4 km

Table 2-15 Unmapped & Unnamed EPA Watercourse Traversing Pipeline Section 5

Water Crossing Reference	Chainage/ ITM Coordinates	Inferred Flow Direction	River Q Values, Status*	Final Receptor
WCX17	15543	Southwest then Northeast	Q3, Poor	River Boyne
WCX18	16054	Southwest then Northeast	N/A*	River Boyne
WCX20	16706	Northeast	Q3, Poor	River Boyne
WCX21	16882	Southwest	Q3, Poor	River Boyne
WCX22	17204	West	N/A*	River Boyne
WCX23 (Grand Canal)	18090	East		Liffey Lower Estuary Transitional Waterbody & Dublin Bay Coastal Waterbody

Note-*Refer to Appendix 7.5 of the EIAR for the Aquatic Fisheries Report Baseline (2025)

N/A*- Waterbody was not of fisheries or aquatic value given the dry nature of the channel, hence it was not possible to obtain biological water quality sample.

Table 2-16 EPA/WFD River Waterbodies traversing chainage Section 5 of the pipeline route (EPA, 2025)

EPA Waterbody Name	WFD Waterbody Name	European Code	WFD Status (2021-2024)	WFD Risk Score (3rd Cycle)
MOUNTWILSON STREAM	Boyne_020	IE_EA_07B040300	Moderate	At Risk
KINNAFAD Stream	Boyne_020	IE_EA_07B040300	Moderate	At Risk

2.1.3.6 Pipeline Section 6: L5003 (RDX15) to the Ballykilleen AGI

According to the EPA (Catchments.ie, 2026), this section of the pipeline is located within the Figile_SC_010 subcatchment. At present, the EPA watercourse mapping indicates that Section 6 is traversed by 2No. river waterbodies. The BALLYKILLEEN Stream traverses through the section 6 of the site at No.2 separate locations (refer to Volume 4 Hydrological Environment Sheet 6 of 6).

Table 2-17 Mapped & Named EPA Watercourse Traversing Pipeline Section 6

EPA Waterbody Name	Water Crossing Reference	Order Class	Flow Direction	Outfall	Distance to Outfall
BALLYLEAKEN	WCX24	Stream	Southeast	River Figile	c. 1.7 km
BALLYKILLEEN Stream	WCX29	Stream	South	River Figile	c. 0.6 km
BALLYKILLEEN Stream	WCX30	Stream	Southeast	River Figile	c. 0.2 km

Table 2-18 Unmapped & Unnamed EPA Watercourse Traversing Pipeline Section 6

Water Crossing Reference	Chainage/ ITM Coordinates	Inferred Flow Direction	River Q Values, Status*	Final Receptor
WCX25	20679	Southeast	Q3, Poor	River Figile
WCX26	21034	Southeast	Q3, Poor	River Figile
WCX27	22459	East	Q3, Poor	River Figile
WCX28	22617	East	Q2-3, Poor	River Figile

Note-*Refer to the Appendix 7.5 for the Aquatic Fisheries Report Baseline (2025).

Table 2-19 EPA/WFD River Waterbodies traversing chainage Section 6 of the pipeline route (EPA, 2025)

EPA Waterbody Name	WFD Waterbody Name	European Code	WFD Status (2021-2024)	WFD Risk Score (3rd Cycle)
BALLYLEAKEN Stream	FIGILE_030	IE_SE_14F010200	Moderate	At Risk
BALLYKILLEEN Stream	FIGILE_030	IE_SE_14F010200	Moderate	At Risk

2.1.3.7 Temporary Construction Compound 03

The Temporary Construction Compound 03 is located within the Boyne_SC_010 WFD subcatchment. There are no river waterbodies traversing the compound boundary area. The waterbody / watercourse is closest proximity to this storage area is the Edenderry Stream (EPA Code: IE_EA_07B040300) which is a secondary tributary to the River Boyne and belongs to the Boyne_020 WFD river waterbody. This source of the stream is located in the eastern side of Edenderry Town centre and flows north where it is located c. 360m to the east of this Temporary Construction Compound 03 at the point of closest proximity. The Edenderry Stream merges/joins with the Monasteroris Stream at a confluence point located c. 410m northeast of this storage compound. From here the Monasteroris Stream continues to flow north for c. 740m before discharging to the River Boyne.

The Kinnafad Stream (Boyne_020), which is a primary tributary of the Boyne River and is located approximately 0.9km to the northwest of this storage area at the point of closest proximity. The Kinnafad Stream flows east/northeast across lands to the north of this storage area before it discharges/outfalls to the Boyne River (Boyne_020) at a confluence point located approximately 1.2km north of the temporary

Construction Compound 03, at the point of closest proximity. From here, the Boyne River flows in a general northern direction.

The Edenderry Stream, Monasteroris Stream and Kinnefad Stream all belong both belong to the Boyne_020 WFD river waterbody. According to Catchments.ie (2026) the Boyne_20 most recent WFD river waterbody status (WFD Period: 2019-2024) is classified as 'Moderate' and its current WFD risk score (3rd risk cycle) is currently 'At Risk' of not achieving good status. This status is related and attributed to its 'Moderate' ecological status or potential, in particular it 'Moderate' biological and invertebrate status or potential and 'Moderate' supporting chemistry and nutrient conditions, in particular elevated Nitrate and Ophosphosphate.

2.1.3.8 Temporary Construction Compound 04

Temporary Construction Compound 04 is located within the Figile_SC_020 WFD Subcatchment. According to the EPA River waterbody mapping database, there are no river waterbodies traversing the Temporary Construction Compound 04 boundary area. The nearest river waterbody is the Rathvilla_or_Rathclonbrackan Stream (EPA Code: IE_SE_14F010300), which rises in a bog c. 550m to the south of the storage compound, prior to flowing north towards the site where it is located c. 75m to the south of the storage compound 4 at the point of closest proximity. The In turn, the Rathvilla_or_Rathclonbrackan Stream (Figile_040) subsequently flows west for c. 1.1km prior to its confluence with the Philipstown River (EPA Name / Code: Daingean / IE_SE_14F010300). From here, the Philipstown River flows in an alternation south and east direction (respectively) prior to discharging to the Figile River (Figile_050) at a confluence point located c. 5.1 km south-east of Temporary Construction Compound 04. Therefore, the Rathvilla_or_Rathclonbrackan Stream and Philipstown (Daingean) River are secondary and primary tributaries of the Figile River.

The Rathvilla_or_Rathclonbrackan Stream and Daingean Stream both belong to the FIGILE_040 WFD river waterbody. According to Catchments.ie (2026) the FIGILE_030 most recent WFD river waterbody status (WFD Period: 2019-2024) is classified as 'Poor' and its current WFD risk score (3rd risk cycle) is currently 'At Risk' of not achieving good status. This status is related and attributed to its 'Moderate' ecological status or potential, in particular it 'Poor' biological and invertebrate status or potential.

2.1.4 Areas of Conservation

The NPWS (2026) on-line database have been reviewed to determine the location of areas of conservation within proximity to the Proposed Development site, and there are no Special Protected Areas (SPA) established under the EU Birds Directive (79/409/EEC), or Special Areas of Conservation (SAC) established under the Habitats Directive within the boundary of the site. Furthermore, with the exception of the fully lined Grand Canal pNHA, there are no Natural Heritage Areas (NHA), or proposed Natural Heritage Areas (pNHA) established under the Wildlife Acts, 1976 and 2000 (as amended) located within the site boundary or vicinity. The lands in which the development is located have no formal designations.

The Areas of Conservation or European Designated Natura 2000 sites in closest proximity of the site are as follows:

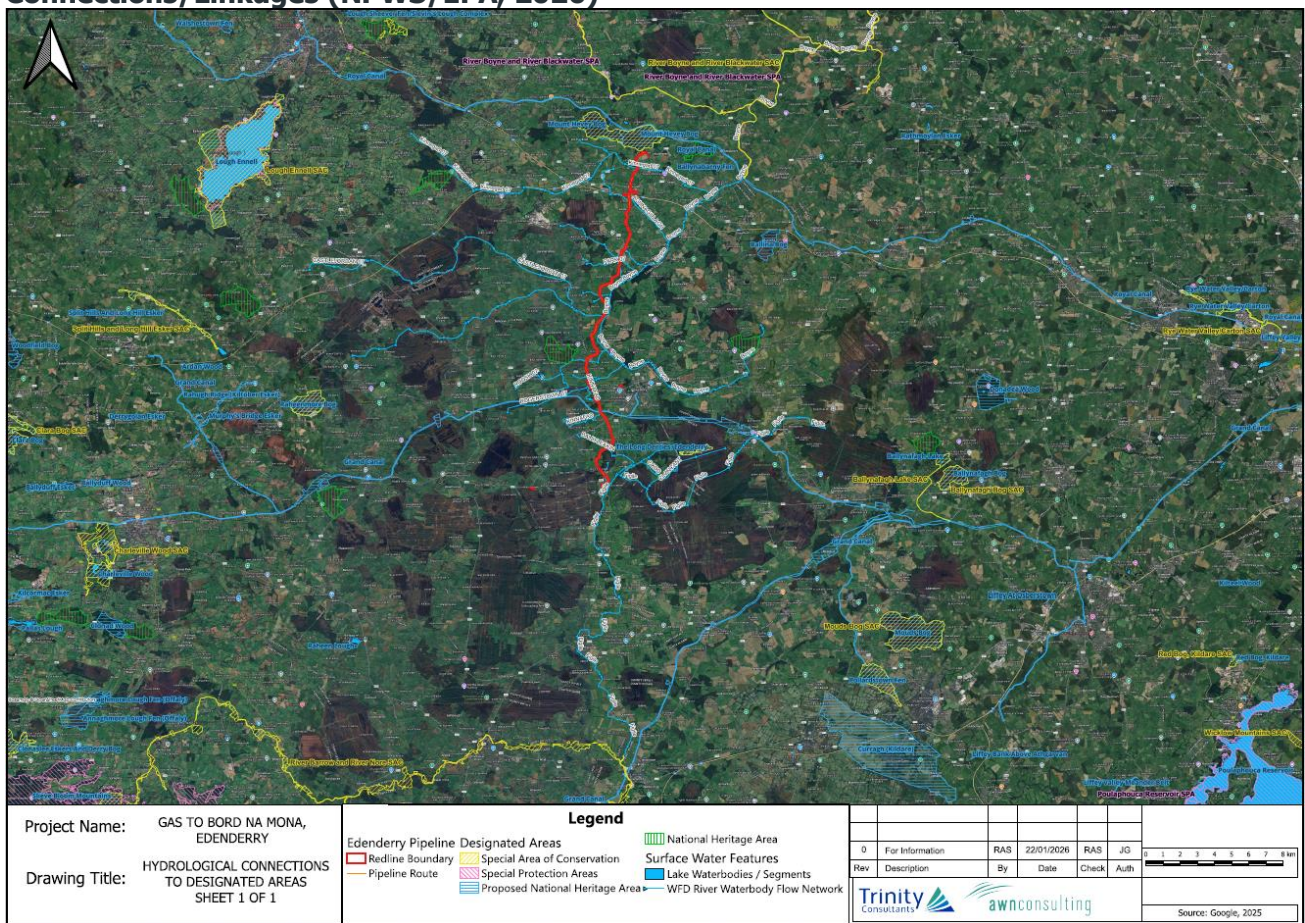
- ▶ The Mount Hevey Bog SAC (Site Code: 002342), located c. 20m north (linear distance) of the Kilwarden Offtake Installation Pipeline Section 1.
- ▶ The River Boyne & River Blackwater SAC (Site Code: 002299), located c. 6.2km east (linear distance) of Pipeline Section 1 at the point of closest proximity.
- ▶ The River Boyne & River Blackwater SPA (Site Code: 004232), located c. 6.2km east (linear distance) of Pipeline Section 1 at the point of closest proximity.
- ▶ The River Nore & River Barrow SAC (Site Code: 002162), located c. 16.1km south (linear distance) at of Pipeline Section 6 the point of closest proximity.

- ▶ The Long Derries, Edenderry SAC (Site Code: 000925), located c. 3.8 km east of Pipeline Section 6 of the site at the point of closest proximity.

The Proposed National Heritage Areas Natural Parks and Wildlife Service (NPWS, 2026) in the context of the site are as follows:

- ▶ The Mount Hevey Bog pNHA (Site Code: 001584), located c. 20m north (linear distance) of the Kilwarden Offtake Installation Pipeline Section 1.
- ▶ The Grand Canal pNHA (Site Code: 002104), traverses / intersects the site at Pipeline Section 5.

Figure 2-1 Designated Areas (SAC, SPA, pNHA) & Hydrological Pathway Connections/Linkages (NPWS/EPA, 2026)



2.1.5 Bathing Waters and Recreational Waterbodies

The local environment also includes areas of natural resources that relate to populations and human health that may be impacted by the Proposed Development, this includes economic resources, recreational and bathing waters, and drinking water resources.

A review of the Environmental Protection Agency's (EPA) online mapping that includes the Register of Protected Areas (RPA) under the Water Framework Directive (WFD) has indicated that there are no Recreational Waters or Bathing Waterbodies located in the immediate vicinity of the site or downstream in any of the watercourses or rivers through which the pipeline route traverses / crosses.

2.1.6 Water Supplies

A review of the Environmental Protection Agency's (EPA) online mapping, which includes the Register of Protected Areas (RPA) established under the Water Framework Directive (WFD), indicates the river waterbodies that traverse the site which are listed above in section 6.3.2.1 are not located within a designated Surface Water Drinking RPA. This classification of drinking water river lines has been delineated in accordance with the European Communities (Drinking Water) (No. 2) Regulations 2007 (SI No. 278/2007). This regulatory framework aims to ensure the protection of water resources utilised for human consumption, thus safeguarding public health and the environment.

A review of the EPA's surface water (river) abstraction register (January 2026) identified no abstraction points located within a 20km radius of the site. The river abstraction pressure location in closest proximity to the site is located within the 'Clodiagh (Tullamore)_050' river waterbody (EPA Code: IE_SH_25C060500), which is situated approximately 31km to the west of the pipeline route. This location is hydrologically upgradient of the site and no hydrological connectivity / pathway to this location exists.

2.2 Hydrogeology

2.2.1 Aquifer Classification, Characteristics, Groundwater Flow and Vulnerability

The Proposed Pipeline Route traverses through 5No. Groundwater Bodies. The description and characteristics and typical flow paths of these groundwater bodies are outlined in Section 6.3.3.2 of Chapter 6.

2.2.1.1 Pipeline Section 1: Kilwarden Offtake Installation to the L40181 Road (RDX05)

The bedrock aquifer underlying the Proposed Development site along Section 1, according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map presented in Volume 4 (Aquifer Classification, Sheets 1 of 6) of the EIAR, Pages 1-2, is classified as a "*LI – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones*", and "*Lm – Locally Important Aquifer – Bedrock which is Generally Moderately Productive*". The GSI aquifer mapping database does not indicate/identify any gravel aquifers underlying this section the site.

The site is underlain by the Athboy groundwater body (GWB) (European Code: IE_EA_G_001).

The flow direction in the overburden generally follows no fixed pattern or trend. Flows of this nature are typical of low permeability clay strata with intermittent fill areas, where often the water level measures represent pore water seepages into the overburden monitoring well (opposed to bedrock wells) or perched groundwater conditions (not bedrock aquifer water). The clay is not considered to be a contamination pathway based on the discontinuous perched/pore water table meaning there is no continuous connectivity of shallow groundwater. These aquifer types are characterised by discrete local fracturing with little connectivity rather than large, connected fractures which are more indicative of Regional Aquifers. As such, flow paths (<750m) are generally local to short distances.

Therefore, given the low permeability subsoils limiting lateral and vertical migration, the established groundwater flow directions from northwest to southeast based on groundwater monitoring undertaken for the scheme and the upgradient/upstream location of the bog relative to the site, there is low potential for a hydrogeological connection/linkage to the Natura 2000/conservation/protection area located at the Mount Hevey Bog SAC, located c. 20 m north of the site at the point of closest proximity (linear distance).

The GSI presently classifies the predominant aquifer vulnerability classification for this section is 'Moderate', while some areas of the central and northern portion of this section have been classified as 'High' and 'Extreme' vulnerability, respectively. Refer to Appendix 5.6 of the EIAR (page 1 & 2) for the

Aquifer Vulnerability mapping for this section. Based on the subsoil type and description, the expected depth to bedrock is expected to be greater than or within the range of 5-10m. However, the northwest portion of the site is depicted as having an aquifer vulnerability which ranges from 'High', 'Extreme', and 'Rock at or near surface (subcrop)', thereby indicating a low permeability subsoil thickness of 3-5m, 0-3m and subcrop/outcrop, respectively.

2.2.1.2 Pipeline Section 2: L40181 Road (RDX05) to the L4091 (RDX09)

The bedrock aquifer underlying the Proposed Development site along Section 2, according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map presented in Volume 4 (Aquifer Classification, Sheets 2 of 6) of this EIAR, is classified predominantly as a "*LI – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones*", and a minor portion in the southern end of this section is classified as "*Lm – Locally Important Aquifer – Bedrock which is Generally Moderately Productive*".

This pipeline section is primarily underlain by the Athboy groundwater body (GWB) (European Code: IE_EA_G_001), the characteristics of which are described in Section 1 above. The GSI database indicates/identifies that a minor localised area of the southern portion of Section 2 is underlain by Kilrathmurry Gravels GWB (European Code: IE_EA_G_044).

The predominant aquifer vulnerability classification for this section is 'Moderate', while some localised areas of the northern and southern portion of this section have been classified as 'High' vulnerability. Refer to Volume 4 (Aquifer Vulnerability Sheet 2 of 6) of this EIAR for the Aquifer Vulnerability mapping for this section. Based on the subsoil type and description, the expected depth to bedrock is expected to be greater than or within the range of 5-10m of low permeability till derived from limestone which is dominant in this section. However, the southern portion of the site associated with the gravels is depicted as 'High' vulnerability, thereby indicating a high permeability subsoil overburden thickness of >3m, respectively.

Despite the presence of a gravel aquifer, this particular area of the gravel aquifer is classified as *LI* and *Lm* aquifer types, which are characterised by discrete local fracturing with little connectivity rather than large, connected fractures which are more indicative of Regional Aquifers. As such, flow paths are generally local to short distances. Therefore, given the local flow paths and little connectivity, there is a low potential for a hydrogeological connection/linkage to the Natura 2000/conservation/protection area located the Mount Hevey Bog SAC, located at circa 3.5km+ north of the site at the point of closest proximity (linear distance).

2.2.1.3 Pipeline Section 3: L4091 Road (RDX09) to the Yellow River (RVX02)

The bedrock aquifer underlying the Proposed Development site, according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map presented in Volume 4 (Aquifer Classification, Sheet 3 of 6) of this EIAR, is classified as a predominantly "*Lm – Locally Important Aquifer – Bedrock which is Generally Moderately Productive*", with smaller localised zones classified as "*LI – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones*".

The northern portion of this section is partially underlain by the Athboy groundwater body (GWB) and Kilrathmurry Gravels GWB. The southern and central portion of Section 3 is overlying the Trim GWB.

The predominant aquifer vulnerability classification for this section is 'Moderate', which are associated with areas underlain by Tills derived from limestone, whereby an overburden thickness of 5-10m of low permeability Clay/Till is expected. Some localised (less extensive) zones of the northern, central and southern portion of this section have been classified as 'High' vulnerability, which are generally associated with the 'Gravels derived from Limestones' with a thickness of 3m+ of high permeability subsoils. Refer to Volume 4 (Aquifer Vulnerability Sheet 3 of 6) of this EIAR for the aquifer/groundwater vulnerability mapping for this section of the site.

Despite the presence of a gravel aquifer and the Trim GWB having areas of karstification, this particular area of the gravel aquifer is classified as *LI* and *Lm* aquifer types, which are characterised by discrete local fracturing with little connectivity rather than large, connected fractures which are more indicative of Regional Aquifers. According to the GSI database, this area does not host karstification or karstic underground traced flow paths and as such, flow paths are generally local to short distances. Therefore, given the local flow paths and little connectivity, there is a low potential for a hydrogeological connection/linkage to the Natura 2000/conservation/protection area located the Mount Hevey Bog SAC, located at circa 7km+ north of the site at the point of closest proximity (linear distance).

2.2.1.4 Pipeline Section 4: Yellow River (RVX02) to the R441 (RDX12)

The bedrock aquifer underlying the Proposed Development site, according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map presented in Volume 4 (Aquifer Classification, Sheets 4 of 6) of this EIAR, is classified entirely as a predominantly "*Lm – Locally Important Aquifer – Bedrock which is Generally Moderately Productive*". This section is not underlain by any gravel aquifer.

There are no recorded groundwater resource protection zones in the immediate area of the proposed site, i.e., zones surrounding a groundwater abstraction area. In addition, groundwater source protection zones, which are zones defined by the GSI within which development is limited in order to protect groundwater from potential pollution, are not identified by the GSI under / beneath the site or in the immediate adjacent lands / vicinity.

This entire section of the site is overlying the Trim GWB (European Code: IE_EA_G_002).

The predominant aquifer vulnerability classification for this section is 'Moderate', while some localised (less extensive) zones of the northern portion of this section has been classified as 'High' vulnerability. Refer to Volume 4 (Aquifer Vulnerability Sheet 4 of 6) for the aquifer/groundwater vulnerability mapping for the Aquifer Vulnerability mapping for this section, whereby an overburden thickness of 5-10m of low permeability Clay/Till is expected. Some localised (less extensive) zones of this section have been classified as 'High' vulnerability, which are generally associated with the 'Gravels derived from Limestones' and 'Alluvium' deposits which are associated with the fluvial / river watercourses which traverse this section, which are expected to have a thickness of 3m+ of high permeability subsoils.

Despite the Trim GWB having areas of karstification, this particular area of the Trim GWB is classified as a locally important (*Lm*) aquifer types, which are characterised by discrete local fracturing with little connectivity rather than large, connected fractures which are more indicative of Regional Aquifers. According to the GSI database, this area does not host karstification or karstic underground traced flowpaths and as such, flow paths are generally local to short distances. Therefore, given the local flow paths and little connectivity, there is a low potential for a hydrogeological connection/linkage to the Natura 2000/conservation/protection area located the Mount Hevey Bog SAC, located at circa 11km+ north of the site at the point of closest proximity (linear distance).

2.2.1.5 Pipeline Section 5: R441 (RDX12) to the L5003 (RDX15)

The bedrock aquifer underlying the Proposed Development site, according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map presented in Volume 4 (Aquifer Classification, Sheets 5 of 6) of this EIAR, is classified entirely as a predominantly "*Lm – Locally Important Aquifer – Bedrock which is Generally Moderately Productive*".

This entire section of the site is overlying the the Trim GWB, the characteristics and flow paths of which are described above in 6.3.8.1 of Chapter 6 of the EIAR: Section 3.

The predominant aquifer vulnerability classification for this section is 'Moderate', while some localised (less extensive) zones of the northern portion of this section has been classified as 'High' vulnerability. Refer to

Volume 4 (Aquifer Vulnerability Sheet 3 of 6) of this EIAR for the Aquifer Vulnerability mapping for this section. An overburden thickness of 5-10m of low permeability 'Cut over raised Peat' and 'Clay/Till derived from limestone' is expected.

Despite the presence of a gravel aquifer and the Trim GWB having areas of karstification, this particular area of the Trim GWB is classified as a locally important (*Lm*) aquifer types, which are characterised by discrete local fracturing with little connectivity rather than large, connected fractures which are more indicative of Regional Aquifers. According to the GSI database, this area does not host karstification or karstic underground traced flow paths and as such, flow paths are generally local to short distances. Therefore, given the local flow paths, little connectivity and overburden thickness of low permeability subsoils there is a low potential for a hydrogeological connection/linkage to the Natura 2000/conservation/protection area located at the Long Derries, Edenderry SAC (Site Code: 000925), located c. 4.1 km east of Section 5 of the site at the point of closest proximity (linear distance).

2.2.1.6 Pipeline Section 6: L5003 (RDX15) to the Ballykilleen AGI

The bedrock aquifer underlying the Proposed Development site, according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map presented in Volume 4 (Aquifer Classification, Sheets 6 of 6) of this EIAR, is classified as a "*LI – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones*", and "*Lm – Locally Important Aquifer – Bedrock which is Generally Moderately Productive*". The GSI aquifer mapping database does not indicate/identify any gravel aquifers underlying this section of the site.

The approximate northern (partial) and central portion of this section of the site is underlain by the Rhodes groundwater body (GWB) (European Code: IE_SE_G_116), which corresponds to a "*LI – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones*".

The approximate northern (partial) and southern portion of this section of the site is underlain by the Cushina groundwater body (GWB) (European Code: IE_SE_G_048), which corresponds to a "*Lm – Locally Important Aquifer – Bedrock which is Moderately Productive*".

The northern and southern parts of this section have been widely classified with 'Moderate' Vulnerability. The central portion of this section displays varied vulnerability, ranging / alternating between 'Low', 'Moderate', 'High' and 'Extreme' vulnerability. Refer to Volume 4 (Aquifer Vulnerability Sheet 6 of 6) of the EIAR for the Aquifer Vulnerability mapping for this section. An overburden thickness of 5-10m of low permeability 'Cut over raised Peat' and 'Clay/Till derived from limestone' is expected throughout the vast majority of this section.

Given that the Rhode GWB is classified as a "*LI – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones*", this groundwater body characterised by discrete local fracturing with little connectivity and local flow paths rather than large, connected fractures which are more indicative of Regional Aquifers. Therefore, given the local flow paths, little connectivity and overburden thickness of low permeability subsoils there is a low potential for a hydrogeological connection/linkage to the Natura 2000/conservation/protection area located at the The Long Derries, Edenderry SAC (Site Code: 000925), located c. 3.8 km east of Section 6 of the site at the point of closest proximity (linear distance).

While the Cushina GWB contains areas of karstification, such zones are confined / limited to the southern parts of this GWB and are not expected to feature in the northernmost portion of this GWB, in which this section of the site is situated. This particular area of the Cushina GWB is classified as a locally important (*LI*) aquifer types, which are characterised by discrete local fracturing with little connectivity rather than large, connected fractures which are more indicative of Regional Aquifers. According to the GSI database, this area does not host karstification or karstic underground traced flow paths and as such, flow paths are generally local to short distances. Therefore, given the local flow paths, little connectivity and overburden thickness of low permeability subsoils there is a low potential for a hydrogeological connection/linkage to

the nearest protection area located at The Long Derries, Edenderry SAC (Site Code: 000925), located c. 3.8 km east of chainage Section 6 of the site at the point of closest proximity (linear distance).

2.2.1.7 Temporary Construction Compound 03

The bedrock aquifer underlying the Proposed Development site, according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map presented in Volume 4 (Compound Aquifer Classification), is classified entirely as a predominantly "*Lm – Locally Important Aquifer – Bedrock which is Generally Moderately Productive*".

This entire section of the site is overlying the Trim GWB.

The aquifer vulnerability classification for this area is 'Moderate'. Refer to Volume 4 (Compound Aquifer Classification), for the Aquifer Vulnerability mapping for this area / section of the site. An overburden thickness of 5-10m of low permeability 'Cut over raised Peat' and 'Clay/Till derived from limestone' is expected.

2.2.1.8 Temporary Construction Compound 04

The bedrock aquifer underlying the Proposed Development site, according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map presented in Volume 4 (Compound Aquifer Classification), is classified as a "*Lm – Locally Important Aquifer – Bedrock which is Generally Moderately Productive*". The GSI aquifer mapping database does not indicate/identify any gravel aquifers underlying this section the site.

The approximate northern (partial) and central portion of this site is underlain by the Rhodes groundwater body (GWB) (European Code: IE_SE_G_116), which corresponds to a "*LI – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones*".

The approximate northern (partial) and southern portion of this site is underlain by the Cushina groundwater body (GWB) (European Code: IE_SE_G_048), which corresponds to a "*Lm – Locally Important Aquifer – Bedrock which is Moderately Productive*".

The aquifer vulnerability classification for this area is 'High'. Refer to Volume 4 (Compound Aquifer Classification), for the Aquifer Vulnerability mapping for this area / section of the site. An overburden thickness of 3-5m of low permeability 'Cut over raised Peat' and 'Clay/Till derived from limestone' is expected.

2.2.2 Groundwater Supply / Resources

The GSI Well Card Index is a record of wells drilled in Ireland, water supply and site investigation boreholes. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in the Republic of Ireland. The current well index shows multiple boreholes are located within a 2km radius of the site. Volume 4 (Groundwater Wells Sheet 1 to 6, corresponding to Sections 1 to 6) of the EIAR presents the GSI well search for the area surrounding the Proposed Development site.

There are no recorded groundwater resource protection zones in the immediate area of the proposed site, i.e., zones surrounding a groundwater abstraction area. In addition, groundwater source protection zones, which are zones defined by the GSI within which development is limited in order to protect groundwater from potential pollution, are not identified by the GSI under / beneath the site or in the immediate adjacent lands / vicinity. Additionally, there are no recorded Public Supply Source Protection Area or Group Scheme Preliminary Source Protection Areas in the vicinity of the proposed development site. There are no recorded source protection areas / Zones (SPZs, which are zones defined by the GSI within which development is limited in order to protect groundwater from potential pollution) or recorded groundwater resource protection zones.

The nearest Group Water Scheme (Preliminary Source Protection Area Zone of Contribution) to the site is Ballykilleen (Zone of Contribution Unique ID IE_GSI_ZOC_37), which is located c. 600m to the east of the subject development site at the point of closest proximity. The subject development site is outside the zone of contribution for this supply.

In addition, groundwater source protection zones, which are zones defined by the GSI within which development is limited in order to protect groundwater from potential pollution, are not identified by the GSI under / beneath the site or in the immediate adjacent lands / vicinity. The Public Water Supply / Public Supply Source Protection Area / Zone (SPZ) / drinking water protection area in closest proximity to the Proposed Development site is the EDENDERRY PWS (Source Protection Area Unique ID: IE_GSI_SPA_269), which is located c. 2.7 km east of the pipeline route beneath the townland of Edenderry (linear distance at the point of closest proximity). The subject development site is outside the zone of contribution for this supply.

Neither of these areas share a hydrological or hydrogeological connection to the site and are located hydrologically upgradient / upstream of the development site.

Refer to Volume 4 (Groundwater Wells Pages 1 to 6) presents the GSI well search for the area surrounding the Proposed Development site.

3. WATERBODIES IDENTIFICATION AND STATUS

This section presents the water bodies identified for assessment, reasoning and water body status.

The Water Framework Directive (WFD) 2000/60/EC was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater, transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of 'Good Status' in water bodies that are of lesser status at present and retaining 'Good Status' or better where such status exists at present. 'Good Status' was to be achieved in all waters by 2015 or at least by 2027, as well as maintaining 'high status' where the status already exists. The EPA co-ordinates the activities of the River Basin Districts, local authorities and state agencies in implementing the directive, and operates a groundwater quality monitoring programme undertaking surveys and studies across the Republic of Ireland.

As presented in Sections 2.1.2 and 2.2.1 above, this WFD Screening has identified five (5) no. WFD surface water bodies (river and stream) and five (5) no. WFD groundwater bodies of relevance due to the close proximity and connection of these waterbodies with the Proposed Development facilities / elements. There are no adverse effects anticipated on the aforementioned waterbodies, or the Natura 2000 site listed above in section 2.1.3 during construction or operation of the proposed development, due to the proposed design and mitigation measures, the length of pathway from the proposed development site, the potential loading of contaminant from the site, the lack of direct hydrological connectivity and significant dilution factor that will occur through its hydrological pathway to receptors.

The Proposed Development will temporarily increase the aquifer vulnerability during construction prior to paving and installation of stormwater drainage and services. However, there is no potential for change in groundwater levels as a result of local changes in the groundwater regime at the site due to the unlikely occurrence of dewatering activities and the natural recharge capacity of the underlying 'Locally Important Aquifer', which allows for the maintenance of groundwater levels. This ensures that the aquifer's integrity and functionality remain unaffected by any temporary minor dewatering measures.

The aforementioned surface and groundwater bodies are listed in Table 3-1 below. For each waterbody, the most recent WFD status (Period: 2019-2024), risk score and location in relation to the proposed development site are provided (EPA, 2025).

Table 3-1. WFD Waterbodies relevant to the Study Area

Type	WFD Classification	WFD Name/ID	WFD Status (2019-2024)	WFD Risk Score	Location
Surface Water	River Waterbody	Boyne_040 (IE_EA_07B040600)	'Poor'	'At Risk of not achieving Good Status'	Traverses Section 1 of the proposed pipeline route (Site).
	River Waterbody	Boyne_030 (IE_EA_07B040400)	'Good'	'Not at Risk'	Traverses Section 2, 3 & 4 and of the proposed pipeline route (Site).
	River Waterbody	YELLOW (CASTLEJORDAN)_030 (IE_EA_07Y020300)	'Good'	'Not at Risk'	Traverses Section 4 of the proposed pipeline route (Site).
	River Waterbody	Boyne_020 (IE_EA_07B040300)	'Moderate'	'At Risk of not achieving Good Status'	Traverses Section 5 of the proposed pipeline route (Site).

Type	WFD Classification	WFD Name/ID	WFD Status (2019-2024)	WFD Risk Score	Location
	River Waterbody	FIGILE_030 (IE_SE_14F010200)	'Moderate'	'At Risk of not achieving Good Status'	Traverses Section 6 of the proposed pipeline route (Site).
Groundwater	Groundwater Body	Athboy Groundwater Body (GWB) (IE_EA_G_001)	'Good'	'Not at Risk'	Located immediately underlying Section 1, 2 & 3 of the proposed development site.
	Groundwater Body	Kilrathmurry Gravels Groundwater Body (GWB) (IE_EA_G_044)	'Good'	'Not at Risk'	Located immediately underlying Section 2 of the proposed development site.
	Groundwater Body	Trim Groundwater Body (GWB) (IE_EA_G_002)	'Good'	'At Risk of not achieving Good Status'	Located immediately underlying Section 3, 4 & 5 of the proposed development site.
	Groundwater Body	Rhode Groundwater Body (GWB) (IE_SE_G_116)	'Good'	'Not at Risk'	Located immediately underlying Section 6 of the proposed development site.
	Groundwater Body	Cushina groundwater body (GWB) (IE_SE_G_048)	'Good'	'Not at Risk'	Located immediately underlying Section 6 of the proposed development site.

Figures 3-1 to 3-5 below summarise the surface water and groundwater quality of the aforementioned surface (river) waterbodies which traverse the proposed pipeline (Site); Figures 3-6 to 3-10 below summarise the groundwater quality of the aforementioned groundwater bodies which are located beneath the respective sections of the site.




3.1 The Boyne_040 WFD River Waterbody

The Kilwarden River (Kinnegad 07), AGHNAGILLAGH Stream, The BALLYNAKIL 07 Stream, the CASTLEJORDAN 07 Stream and the RAHIN Stream all belong to the Boyne_040 WFD surface waterbody. According to Catchments.ie (2025) the Boyne_040 most recent WFD surface water status (WFD Period: 2019-2024) is classified as 'Poor' and its current WFD risk score (3rd risk cycle) is currently 'At Risk'. This status is related and attributed to its 'Poor' ecological status or potential, in particular its 'Poor' biological and invertebrate status or potential (refer to Figure 3-1 below). This status (as we can see in Figure 3-1 below) has medium confidence, according to the EPA.

According to the Cycle 3 HA 07 Boyne Catchment Report (May 2024), the main pressures identified on the Boyne_040 river waterbody are associated with issues related to Morphological, Organic Hydromorphology, resulting from sources such as Mines, Quarries, peat Drainage & extraction.

The most recent Sub-Catchment Assessment (December 2018) carried out by the EPA on the Boyne_SC_030 Sub-Catchment states the main pressure identified on the Boyne_040 WFD surface/river waterbody is from hydromorphology through channelization, coupled with extractive industry, specifically peat harvesting and quarries.

Figure 3-1. Surface Water Quality 2019-2024 for the Boyne_040 WFD River Waterbody (Catchments.ie, 2025)

Waterbody: BOYNE_040			
Name:	BOYNE_040	Code:	IE_EA_07B040600
Subcatchments:	07_16_Boyne_SC_020 07_2_Boyne_SC_030	Catchments:	07_Boyne
Latitude:	53.4287177	Longitude:	-7.0268402
Cycle 1 RBD:	Eastern	Local Authority:	Meath County Council
Waterbody Category:	River	WFD Risk:	At risk
Protected Area:	Yes	High Status Objective:	No
Heavily Modified:	Unknown	Artificial:	Unknown
Area (Km ²):	N/A	Length (Km):	36.77
Transboundary:	No	Canal:	No
SW 2019-2024			
Status	Assessment Technique	Status Confidence	Value
▼ Ecological Status or Potential	Monitoring	medium confidence	Poor 
▼ Biological Status or Potential			Poor 
Invertebrate Status or Potential			Poor 

3.2 The Boyne_030 WFD River Waterbody

The KNOCKERSALLY (COLEHILL) Stream, PARK 07 Stream, BALLYNAKIL 07 Stream, the CASTLEJORDAN 07 Stream, RAHIN Stream and ROOSK 07 Stream all belong to the Boyne_030 river waterbody. According to Catchments.ie (2025) the Boyne_030 most recent WFD surface water status (WFD Period: 2019-2024) is classified as 'Good' and its current WFD risk score (3rd risk cycle) is currently 'Not At Risk'. This status is related and attributed to its 'Good' ecological status or potential, in particular its 'Good' biological and invertebrate status or potential (refer to Figure 3-2 below).

According to the Cycle 3 HA 07 Boyne Catchment Report (May 2024) and the most recent Sub-Catchment Assessment (December, 2018) carried out by the EPA on the Boyne_SC_010 Sub-Catchment, there are no pressures identified on this waterbody.

Figure 3-2. Surface Water Quality 2019-2024 for the Boyne_030 WFD River Waterbody (Catchments.ie, 2025)

Waterbody: BOYNE_030			
Name:	BOYNE_030	Code:	IE_EA_07B040400
Subcatchments:	07_4 Boyne_SC_010	Catchments:	07 Boyne
Latitude:	53.38241	Longitude:	-7.0867124
Cycle 1 RBD:	Eastern	Local Authority:	Meath County Council
Waterbody Category:	River	WFD Risk:	Not at risk
Protected Area:	Yes	High Status Objective:	No
Heavily Modified:	Unknown	Artificial:	Unknown
Area (Km ²):	N/A	Length (Km):	42.51
Transboundary:	No	Canal:	No

SW 2019-2024

Status	Assessment Technique	Status Confidence	Value
▼ Ecological Status or Potential	Monitoring	high confidence	Good
▼ Biological Status or Potential			Good
Invertebrate Status or Potential			Good
▼ Supporting Chemistry Conditions			Pass
▼ General Conditions			Pass
▼ Oxygenation Conditions			Pass
Dissolved Oxygen (% Sat)			Pass
Other determinand for oxygenation conditions			High
▼ Acidification Conditions			Pass
pH			Pass
▼ Nutrient Conditions			Pass
▼ Nitrogen Conditions			Moderate
Nitrate			Moderate
Ammonium			High
▼ Phosphorous Conditions			High
Orthophosphate			High

3.3 The YELLOW (CASTLEJORDAN)_030 WFD River Waterbody

The Yellow [Castlejordan] Stream belong to the YELLOW (CASTLEJORDAN)_030 WFD river waterbody. According to Catchments.ie (2025) the YELLOW (CASTLEJORDAN)_030 most recent WFD surface water status (WFD Period: 2019-2024) is classified as 'Good' and its current WFD risk score (3rd risk cycle) is currently 'Not At Risk'. This status is related and attributed to its 'Good' ecological status or potential, in particular it 'Good' biological and invertebrate status or potential (refer to Figure 3-3 below). This status (as we can see in Figure 3-3 below) has medium confidence, according to the EPA.

According to the Cycle 3 HA 07 Boyne Catchment Report (May 2024) and the most recent Sub-Catchment Assessment (December, 2018) carried out by the EPA on the Boyne_SC_010 Sub-Catchment, there are no pressures categories identified on this waterbody.

Figure 3-3. Surface Water Quality 2019-2024 for the YELLOW (CASTLEJORDAN)_030 WFD River Waterbody (Catchments.ie, 2025)

Waterbody: YELLOW (CASTLEJORDAN)_030			
Name:	YELLOW (CASTLEJORDAN)_030	Code:	IE_EA_07Y020300
Subcatchments:	07_11 Yellow(CastleJordan)_SC_010	Catchments:	07 Boyne
Latitude:	53.3797549	Longitude:	-7.1623685
Cycle 1 RBD:	Eastern	Local Authority:	Offaly County Council
Waterbody Category:	River	WFD Risk:	Not at risk
Protected Area:	No	High Status Objective:	No
Heavily Modified:	Unknown	Artificial:	Unknown
Area (Km ²):	N/A	Length (Km):	29.10
Transboundary:	No	Canal:	No
SW 2019-2024			
Status	Assessment Technique	Status Confidence	Value
▼ Ecological Status or Potential	Monitoring	medium confidence	Good
▼ Biological Status or Potential			Good
Invertebrate Status or Potential			Good
▼ Supporting Chemistry Conditions			Pass
▼ General Conditions			Pass
▼ Oxygenation Conditions			Pass
Dissolved Oxygen (% Sat)			Pass
Other determinand for oxygenation conditions			High
▼ Acidification Conditions			Pass
pH			Pass
▼ Nutrient Conditions			Pass
▼ Nitrogen Conditions			Moderate
Nitrate			Moderate
Ammonium			High
▼ Phosphorous Conditions			High
Orthophosphate			High

3.4 The Boyne_020 WFD River Waterbody

The MOUNTWILSON Stream and KINNAFAD Stream both belong to the Boyne_020 WFD river waterbody. According to Catchments.ie (2025) the Boyne_020 most recent WFD river waterbody status (WFD Period: 2019-2024) is classified as 'Moderate' and its current WFD risk score (3rd risk cycle) is currently 'At Risk'. This status is related and attributed to its 'Moderate' ecological status or potential, in particular its 'Moderate' biological and invertebrate status or potential and 'Moderate' supporting chemistry and nutrient conditions, in particular elevated Ammonium (refer to Figure 3-4 below).

According to the Cycle 3 HA 07 Boyne Catchment Report (May 2024), the main pressure identified on the Boyne_040 river waterbody are attributed to the issues (categories) related to of Hydrological, Morphological, Nutrients, and Organic, which is associated with Hydromorphology, Agriculture and Urban Runoff.

The most recent Sub-Catchment Assessment (December, 2018) carried out by the EPA on the Boyne_SC_010 Sub-Catchment states the main pressure identified on the Boyne_020 WFD surface/river waterbody is from hydromorphology through land drainage, urban wastewater (Agglomeration PE of 2,001 to 10,000) and urban run-off (diffuse sources).

Figure 3-4. Surface Water Quality 2019-2024 for the Boyne_020 WFD River Waterbody (Catchments.ie, 2025)

Waterbody: BOYNE_020			
Name:	BOYNE_020	Code:	IE_EA_07B040300
Subcatchments:	07_4 Boyne_SC_010	Catchments:	07 Boyne
Latitude:	53.3433837	Longitude:	-7.1080762
Cycle 1 RBD:	Eastern	Local Authority:	Offaly County Council
Waterbody Category:	River	WFD Risk:	At risk
Protected Area:	Yes	High Status Objective:	No
Heavily Modified:	Unknown	Artificial:	Unknown
Area (Km ²):	N/A	Length (Km):	23.93
Transboundary:	No	Canal:	No
SW 2019-2024			
Status	Assessment Technique	Status Confidence	Value
▼ Ecological Status or Potential	Monitoring	high confidence	Moderate
▼ Biological Status or Potential			Moderate
Invertebrate Status or Potential			Moderate
▼ Supporting Chemistry Conditions			Moderate
▼ General Conditions			Moderate
▼ Oxygenation Conditions			Pass
Dissolved Oxygen (% Sat)			Pass
Other determinand for oxygenation conditions			High
▼ Acidification Conditions			Pass
pH			Pass
▼ Nutrient Conditions			Moderate
▼ Nitrogen Conditions			Moderate
Nitrate			Moderate
Ammonium			High
▼ Phosphorous Conditions			Moderate
Orthophosphate			Moderate

3.5 The Figile_030 WFD River Waterbody

The BALLYLEAKEN Stream and BALLYKILLEEN Stream both belong to the FIGILE_030 WFD river waterbody. According to Catchments.ie (2025) the FIGILE_030 most recent WFD river waterbody status (WFD Period: 2019-2024) is classified as 'Moderate' and its current WFD risk score (3rd risk cycle) is currently 'At Risk'. This status is related and attributed to its 'Moderate' ecological status or potential, in particular it 'Moderate' biological and invertebrate status or potential and 'Moderate' supporting chemistry and nutrient conditions, in particular elevated Ammonium (refer to Figure 3-5 below).

According to the Cycle 3 HA 14 Barrow Catchment Report (May 2024), the main pressure identified on the FIGILE_030 river waterbody are attributed to issues related to of Sediment, Hydrological and Organic, which is associated with Peat Drainage and Extraction.

The most recent Sub-Catchment Assessment (December 2018) carried out by the EPA on the Figile_SC_010 Sub-Catchment states the main pressure identified on the FIGILE_030 WFD surface/river waterbody is from extractive industry, specifically related to peat extraction.

Figure 3-5. Surface Water Quality 2019-2024 for the Figile_030 WFD River Waterbody (Catchments.ie, 2025)













Waterbody: FIGILE_030			
Name:	FIGILE_030	Code:	IE_SE_14F010200
Subcatchments:	14_3 Figile_SC_010	Catchments:	14 Barrow
Latitude:	53.2888039	Longitude:	-7.0471754
Cycle 1 RBD:	South Eastern	Local Authority:	Offaly County Council
Waterbody Category:	River	WFD Risk:	At risk
Protected Area:	No	High Status Objective:	No
Heavily Modified:	Unknown	Artificial:	Unknown
Area (Km ²):	N/A	Length (Km):	36.40
Transboundary:	No	Canal:	No
SW 2019-2024			
Status	Assessment Technique	Status Confidence	Value
▼ Ecological Status or Potential	Monitoring	high confidence	Moderate
▼ Biological Status or Potential			Moderate
Invertebrate Status or Potential			Moderate
▼ Supporting Chemistry Conditions			Pass
▼ General Conditions			Pass
▼ Oxygenation Conditions			Pass
Dissolved Oxygen (% Sat)			Pass
Other determinand for oxygenation conditions			High
▼ Acidification Conditions			Pass
pH			Pass
▼ Nutrient Conditions			Pass
▼ Nitrogen Conditions			Good
Nitrate			Good
Ammonium			High
▼ Phosphorous Conditions			High
Orthophosphate			High

3.6 The Athboy WFD Groundwater Body

Based on the most recent data (www.epa.ie), the Athboy GWB for which the Section 1 of the site is located entirely within, has a WFD status of "Good" (WFD Period: 2019-2024) and a WFD risk score (3rd Cycle) of "Not at Risk" of not achieving good status. This status and rating is driven by and attributed to the "Good" Quantitative Groundwater Body Status and "Good" Chemical Groundwater Body Status. Therefore, the overall groundwater status is considered Good (refer to Figure 3-6 below).

According to the Cycle 3 HA 07 Boyne Catchment Report (May 2024) there are no main pressure categories identified on or associated with the Athboy GWB.

Figure 3-6. Groundwater Quality 2019-2024 for Athboy Groundwater Body (Catchments.ie, 2025)













Waterbody: Athboy			
Name:	Athboy	Code:	IE_EA_G_001
Catchments:	07 Boyne 14 Barrow 25A Lower Shannon 26F Upper Shannon		
Latitude:	-7.0751911	Longitude:	53.5576275
Cycle 1 RBD:	Eastern	Local Authority:	Westmeath County Council
Waterbody Category:	Groundwater	WFD Risk:	Not at risk
Protected Area:	N/A	High Status Objective:	No
Heavily Modified:	N/A	Artificial:	N/A
Area (Km ²):	N/A	Length (Km):	N/A
Transboundary:	No	Canal:	No
GW 2019-2024			
Status	Assessment Technique	Status Confidence	Value
▼ Overall Groundwater Status			Good 
▼ Quantitative Groundwater Status			Good 
Saline (or Other) Intrusions Test			Good 
Impact of Groundwater on Surface Water Ecological/Quantitative Status Test			Good 
Groundwater Dependent Ecosystems (GWDTE) - Quantitative Assessment Test			Good 
Water Balance Test			Good 
▼ Chemical Groundwater Status			Good 
Saline (or Other) Intrusions Test			Good 
Impact of Groundwater on Surface Water Ecological/Chemical Status Test			Good 
Groundwater Dependent Ecosystems (GWDTE) - Chemical Assessment Test			Good 
Drinking Water Protected Area Test			Good 
General Chemical Assessment Test			Good 

3.7 The Kilrathmurry Gravels WFD Groundwater Body

Based on the most recent data (www.epa.ie), the Kilrathmurry Gravels GWB for which the site is located entirely within, has a WFD status of “Good” (WFD Period: 2019-2024) and a WFD risk score (3rd Cycle) of “Not at Risk” of not achieving good status. This status is driven by and attributed to the “Good” Quantitative Groundwater Body Status and “Good” Chemical Groundwater Body Status. Therefore, the overall groundwater status is considered Good (refer to Figure 3-7 below).

According to the Cycle 3 HA 07 Boyne Catchment Report (May 2024) there are no main pressure categories identified on or associated with the Kilrathmurry Gravels GWB.

Figure 3-7. Groundwater Quality 2019-2024 for Kilrathmurry Gravels Groundwater Body (Catchments.ie, 2025)

Waterbody: Kilrathmurry Gravels			
Name:	Kilrathmurry Gravels	Code:	IE_EA_G_044
Catchments:	07 Boyne		
Latitude:	-7.0179323	Longitude:	53.4151008
Cycle 1 RBD:	Eastern	Local Authority:	Kildare County Council
Waterbody Category:	Groundwater	WFD Risk:	Not at risk
Protected Area:	N/A	High Status Objective:	No
Heavily Modified:	N/A	Artificial:	N/A
Area (Km ²):	N/A	Length (Km):	N/A
Transboundary:	No	Canal:	No
GW 2019-2024			
Status	Assessment Technique	Status Confidence	Value
▼ Overall Groundwater Status			Good 
▼ Quantitative Groundwater Status			Good 
Saline (or Other) Intrusions Test			Good 
Impact of Groundwater on Surface Water Ecological/Quantitative Status Test			Good 
Groundwater Dependent Ecosystems (GWDTE) - Quantitative Assessment Test			Good 
Water Balance Test			Good 
▼ Chemical Groundwater Status			Good 
Saline (or Other) Intrusions Test			Good 
Impact of Groundwater on Surface Water Ecological/Chemical Status Test			Good 
Groundwater Dependent Ecosystems (GWDTE) - Chemical Assessment Test			Good 
Drinking Water Protected Area Test			Good 
General Chemical Assessment Test			Good 

3.8 The Trim WFD Groundwater Body

Based on the most recent data (www.epa.ie), the Trim GWB for which the site is located entirely within, has a WFD status of "Good" (WFD Period: 2019-2024) and a WFD risk score (3rd Cycle) of "At Risk" of not achieving good status. This current 'Good' status is driven by and attributed to the "Good" Quantitative Groundwater Body Status and "Good" Chemical Groundwater Body Status. Therefore, the overall groundwater status is considered Good (refer to Figure 3-8 below).

According to the Cycle 3 HA 07 Boyne Catchment Report (May 2024), the main pressures identified on the Boyne_040 river waterbody are attributed to the issues related to 'Chemical Quality Diminution of SW' and Nutrients, which arise from pressures sources such as Domestic Wastewater Treatment Systems (DWTS) and Agriculture (runoff).

Figure 3-8. Groundwater Quality 2019-2024 for Trim Groundwater Body (Catchments.ie, 2025)

Waterbody: Trim			
Name:	Trim	Code:	IE_EA_G_002
Catchments:	07 Boyne 08 Nanny-Delvin 09 Liffey and Dublin Bay 14 Barrow		
Latitude:	-6.8508601	Longitude:	53.38294
Cycle 1 RBD:	Eastern	Local Authority:	Meath County Council
Waterbody Category:	Groundwater	WFD Risk:	At risk
Protected Area:	N/A	High Status Objective:	No
Heavily Modified:	N/A	Artificial:	N/A
Area (Km ²):	N/A	Length (Km):	N/A
Transboundary:	No	Canal:	No
GW 2019-2024			
Status	Assessment Technique	Status Confidence	Value
▼ Overall Groundwater Status			Good
▼ Quantitative Groundwater Status			Good
Saline (or Other) Intrusions Test			Good
Impact of Groundwater on Surface Water Ecological/Quantitative Status Test			Good
Groundwater Dependent Ecosystems (GWDTE) - Quantitative Assessment Test			Good
Water Balance Test			Good
▼ Chemical Groundwater Status			Good
Saline (or Other) Intrusions Test			Good
Impact of Groundwater on Surface Water Ecological/Chemical Status Test			Good
Groundwater Dependent Ecosystems (GWDTE) - Chemical Assessment Test			Good
Drinking Water Protected Area Test			Good
General Chemical Assessment Test			Good

3.9 The Rhodes WFD Groundwater Body (GWB)

Based on the most recent data (www.epa.ie), the Rhode GWB has a WFD status of "Good" (WFD Period: 2019-2024) and a WFD risk score (3rd Cycle) of "Not at Risk" of not achieving good status. This status is driven by and attributed to the "Good" Quantitative Groundwater Body Status and "Good" Chemical Groundwater Body Status. Therefore, the overall groundwater status is considered Good (refer to Figure 3-9 below).

According to the Cycle 3 HA 07 Boyne Catchment Report (May 2024) there are no main pressure categories or issues identified on or associated with Rhode GWB.

Figure 3-9. Groundwater Quality 2019-2024 for Rhode Groundwater Body (Catchments.ie, 2025)













Waterbody: Rhode			
Name:	Rhode	Code:	IE_SE_G_116
Catchments:	07 Boyne 14 Barrow 25A Lower Shannon		
Latitude:	-7.1780462	Longitude:	53.2840676
Cycle 1 RBD:	South Eastern	Local Authority:	Offaly County Council
Waterbody Category:	Groundwater	WFD Risk:	Not at risk
Protected Area:	N/A	High Status Objective:	No
Heavily Modified:	N/A	Artificial:	N/A
Area (Km ²):	N/A	Length (Km):	N/A
Transboundary:	No	Canal:	No
GW 2019-2024			
Status	Assessment Technique	Status Confidence	Value
▼ Overall Groundwater Status			Good
▼ Quantitative Groundwater Status			Good
Saline (or Other) Intrusions Test			Good
Impact of Groundwater on Surface Water Ecological/Quantitative Status Test			Good
Groundwater Dependent Ecosystems (GWDTE) - Quantitative Assessment Test			Good
Water Balance Test			Good
▼ Chemical Groundwater Status			Good
Saline (or Other) Intrusions Test			Good
Impact of Groundwater on Surface Water Ecological/Chemical Status Test			Good
Groundwater Dependent Ecosystems (GWDTE) - Chemical Assessment Test			Good
Drinking Water Protected Area Test			Good
General Chemical Assessment Test			Good

3.10 The Cushina WFD Groundwater Body

Based on the most recent data (www.epa.ie), the Cushina GWB for which the site is located entirely within, has a WFD status of "Good" (WFD Period: 2019-2024) and a WFD risk score (3rd Cycle) of "Not at Risk" of not achieving good status. This status is driven by and attributed to the "Good" Quantitative Groundwater Body Status and "Good" Chemical Groundwater Body Status. Therefore, the overall groundwater status is considered Good (refer to Figure 3-10 below).

According to the Cycle 3 HA 07 Boyne Catchment Report (May 2024) there are no main pressure categories or issues identified on or associated with the Cushina GWB.

Figure 3-10. Groundwater Quality 2019-2024 for Cushina Groundwater Body (Catchments.ie, 2025)

Waterbody: Cushina			
Name:	Cushina	Code:	IE_SE_G_048
Catchments:	07 Boyne 14 Barrow		
Latitude:	-7.1087579	Longitude:	53.1946249
Cycle 1 RBD:	South Eastern	Local Authority:	Offaly County Council
Waterbody Category:	Groundwater	WFD Risk:	Not at risk
Protected Area:	N/A	High Status Objective:	No
Heavily Modified:	N/A	Artificial:	N/A
Area (Km ²):	N/A	Length (Km):	N/A
Transboundary:	No	Canal:	No
GW 2019-2024			
Status	Assessment Technique	Status Confidence	Value
▼ Overall Groundwater Status			Good 
▼ Quantitative Groundwater Status			Good 
Saline (or Other) Intrusions Test			Good 
Impact of Groundwater on Surface Water Ecological/Quantitative Status Test			Good 
Groundwater Dependent Ecosystems (GWDTE) - Quantitative Assessment Test			Good 
Water Balance Test			Good 
▼ Chemical Groundwater Status			Good 
Saline (or Other) Intrusions Test			Good 
Impact of Groundwater on Surface Water Ecological/Chemical Status Test			Good 
Groundwater Dependent Ecosystems (GWDTE) - Chemical Assessment Test			Good 
Drinking Water Protected Area Test			Good 
General Chemical Assessment Test			Good 

4. DESCRIPTION OF THE PROPOSED DEVELOPMENT

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the Proposed Development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development package.

For a more comprehensive understanding of the Proposed Development, please refer to Chapter 2 'Description of the Proposed Development' of the EIA Report. Chapter 2 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant document in order to define the Proposed Development.

4.1 Construction Phase

The activities required for the construction phase of the Proposed Development represents the greatest risk of potential impact on the hydrological and hydrogeological environment. These activities primarily pertain to site enabling works, preparation, excavation and infilling activities required to facilitate construction of the Proposed Development.

Construction laydown areas will be established during the earthworks and site preparation phase which will be used by the main follow-on contractors to accommodate temporary construction facilities such as site offices, parking, storage of construction materials and temporary sheds/workshops.

4.1.1.1 Watercourse Crossings – Overview

The Proposed Development intersects a total of 32 watercourses (river/stream/ditch/canal), the majority of which will be crossed using open cut trenches. Table 4-1 and Table 4-2 details the location and crossing method of each water course crossing (WCX). These crossings are associated with tertiary ditches that ultimately discharge into the watercourses described above.

Table 4-1 GNI143 Ballykilleen Pipeline River Crossing Methodology

RVX No.	River	Pipeline Chainage (m)	Approximate Crossing Span/Length (m)	Anticipated Crossing Construction Technique ^[1]
RVX01	Kilwarden River	1230	272	Trenchless
RVX02	Yellow River	11414	509	Trenchless

Table 4-2 GNI143 Ballykilleen Pipeline Watercourse Crossing Methodology

Water Crossing	Stream	Chainage/ ITM Coordinates	Crossing Span (m)	Anticipated Crossing Technique
WCX01	Unmapped channel	1900	3	Open Cut
WCX02	Aghinahillagh Stream	3187	6	Open Cut
WCX03	Unmapped channel	4893	3	Open Cut
WCX04	Knockerasally or Colehill River	6666	7	Open Cut
WCX05	Park River	7303	6	Open Cut
WCX06	Ballynakill Stream	7496	20	Open Cut
WCX07	Unmapped channel	8030	5	Open Cut
WCX08	Unmapped channel	8815	5	Open Cut
WCX09	Unmapped channel	9278	6	Open Cut
WCX10	Unmapped channel	9603	7	Open Cut
WCX11	Castlejordan River	10036	6	Open Cut
WCX12	Rahin Stream	10125	6	Open Cut

WCX13	Unmapped channel	12916	6	Open Cut
WCX14	Unmapped stream	13124	8	Open Cut
WCX15	Unmapped channel	13376	5	Open Cut
WCX16	Rosk River	14871	10	Open Cut
WCX17	Unmapped channel	15543	6	Open Cut
WCX18	Unmapped channel	16054	3	Open Cut
WCX19	Kinnafad River	16366	7	Open Cut
WCX20	Unmapped stream	16706	9	Open Cut
WCX21	Unmapped channel	16882	5	Open Cut
WCX22	Unmapped channel	17204	6	Open Cut
WCX23	Grand Canal	18090	192	Trenchless
WCX24	Ballyleakin River	20522	4	Open Cut
WCX25	Unmapped channel	20679	6	Open Cut
WCX26	Unmapped channel	21034	5	Open Cut
WCX27	Unmapped channel	22459	5	Open Cut
WCX28	Unmapped channel	22617	5	Open Cut
WCX29	Ballykilleen Stream	22753	4	Trenchless
WCX30	Ballykilleen Stream	23151	5	Open Cut

4.1.1.1.1 Open Cut - Watercourse Crossings

Open-cut watercourse crossings represent a key interaction pathway between construction activities and surface waters. The contractor may opt for a trenchless crossing method if they deem it more suitable for ease of construction. At these locations, construction activities may involve:

- ▶ Temporary diversion of flow using flume pipes;
- ▶ Short-term isolation of the working area from flowing water;
- ▶ Excavation of the channel bed to the required depth; and
- ▶ Reinstatement of the watercourse bed and banks following pipe installation.

Open cut water crossings are carried out as quickly as possible (typically 3-4 days) to minimise their potential environmental impact. The methodology for open-cut watercourse crossings, including the use of temporary flumes, sediment control measures, and reinstatement requirements, is described in Chapter 2, Section 2.4.2.3.

4.1.1.1.2 Trenchless - River / Watercourse / Road Crossings

Trenchless construction techniques will be employed at key sensitive crossings along the route to minimise disturbance to soils, geology and surface features. Confirmed trenchless crossings include:

- ▶ Kilwarden River (RVX01)
 - The indicative planning design provides for an HDD crossing length of approximately 271.13 m (c. 272 m), gas transmission pipeline installed entirely underground. The HDD reaches a maximum depth of approximately 50 mOD below ground, corresponding to a depth of approximately 14.46 m beneath the bed of the Kilwarden River (RVX01) at its deepest point. See application drawing GNI143-GNI-PL-CRI-0001
- ▶ Yellow River (RVX02)
 - The indicative planning design provides for an HDD crossing length of approximately 508.7 m (c. 508 m), gas transmission pipeline installed entirely underground. The HDD reaches a maximum depth of approximately 40 mOD below ground, corresponding to a depth of approximately 21.73 m beneath the Yellow River (RDX02) at its deepest point. See application drawing GNI143-GNI-PL-CRI-0002.

- ▶ M4 Motorway (RDX04)
 - The indicative planning design provides for an HDD crossing length of approximately 349.65 m (c. 350 m), gas transmission pipeline installed entirely underground. The HDD reaches a maximum depth of approximately 50 m mOD below ground, corresponding to a depth of approximately 20 m beneath the existing M4 Motorway (RVX01) at its deepest point, and 6.85m below the Aghinahillagh Stream (WCX02). See application drawing GNI143-GNI-PL-CRD-0003.
- ▶ Grand Canal (WCX23)
 - The indicative planning design provides for an HDD crossing length of approximately 191.59 m (c. 192 m), gas transmission pipeline installed entirely underground. The HDD reaches a maximum depth of approximately 66 m mOD below ground, corresponding to a depth of approximately 9.2m beneath the Grand Canal (WCX23) at its deepest point. See application drawing GNI143-GNI-PL-CWC-0001.

It is also anticipated that up to four additional regional road crossings may be constructed using trenchless techniques; however, the final construction methodology at these locations will be confirmed by the appointed contractor during the construction phase, who may elect to use open-cut methods subject to site-specific conditions.

4.1.1.2 Temporary Construction Infrastructure

A full description of the location, layout and construction of temporary infrastructure is provided in Chapter 2 (Description of the Proposed Development) Section 2.4.4.

4.1.1.2.1 Construction Compounds and Haul Roads

Temporary construction compounds, and material laydown areas will be established (refer to Chapter 2, Section 2.4.4.4). Temporary haul roads (also referred to as running tracks) will be established within the pipeline working width to facilitate the movement of construction vehicles, plant and materials along the route (see Chapter 2, Section 2.4.4.1). These works in general include:

- ▶ Temporary stripping and stockpiling of topsoil and subsoil;
- ▶ Creation of temporary areas of compacted ground or stone surfacing;
- ▶ Formation of compacted stone or temporary surfacing over geotextile membrane where required;
- ▶ Localised compaction of soils, with potential short-term effects on infiltration rates;
- ▶ Interaction with existing agricultural field drainage systems and minor drainage ditches;
- ▶ Use of bog mats or similar measures in soft ground or flood-prone areas to limit ground disturbance;
- ▶ Storage of fuels, oils and chemicals within designated, bunded areas; and
- ▶ Generation and management of surface water runoff from disturbed or compacted surfaces.

Construction compounds will be reinstated following completion of construction works, with topsoil replaced and land restored to preconstruction condition, thereby ensuring no permanent alteration to drainage or infiltration characteristics. Haul roads are fully temporary and will be removed following pipeline installation, with ground regraded and reinstated using stored topsoil. -construction condition, thereby ensuring no permanent alteration to drainage or infiltration characteristics.

4.1.1.2.2 Temporary Watercourse Structures

Temporary watercourse structures will be installed along the pipeline route to facilitate construction access. These will be temporary bridge installations and temporary culverts at watercourse crossings. A detailed description of their design and installation is provided in Chapter 2 (Description of the Proposed Development) Sections 2.4.4.2.

A temporary bridge structure will be installed over the Kilwarden River (RVX01) to facilitate construction access across the watercourse without in-channel working. Temporary bridges may also be used at other

watercourse crossings where required. All temporary bridge installations will be subject to approval under OPW Section 50 and will be removed following completion of construction works, with adjacent banks and lands reinstated to their pre-construction condition.

At watercourse crossings, temporary culverts will be installed to allow for an uninterrupted construction running track during pipeline installation. These culverts will temporarily convey flows through the watercourse beneath the running track. All temporary culverts will be removed once construction works in the vicinity have been completed, and watercourse beds and banks will be reinstated to their original profiles. The installation and removal of temporary culverts will also be subject to OPW Section 50 approval.

4.1.1.3 Earthworks, Excavation and Material Management

Open cut trenches are excavated to the required minimum 1.65 m depth (to base of trench), ensuring depth of cover to the top of the pipe is not less than 1.2 m. All concrete surface areas (AGI, Hot Tap & Pigging Compound) will be excavated to 0.45m below ground plus additional for hot tap area & topsoil stripping. During the construction process, there will be a need for localised stockpiling of this soil, soil, tarmac and hardcore in certain areas.

The stockpiling of the soil component allows for the efficient reuse of excavated material on site, rather than importing fill material from off-site. This approach reduces the environmental impact of the construction project by minimizing the amount of waste that needs to be disposed of and reducing the need for transportation of materials. It is anticipated that the majority (80-90%) of the excavated soil will be reinstated as backfill.

4.1.1.4 Construction Water Use and Hydrostatic Testing

Following installation, the pipeline will undergo hydrostatic pressure testing using approximately 6,667,655 litres of clean potable water. There are no chemical additives to this water. The required water will be sourced from an existing supply either from nearby municipal supply point (mains water supply, local authority fire hydrants) or alternatively, abstraction from another water supply in private ownership from groundwater / surface water that is permitted and registered with the EPA under the European Union (Water Policy) (Abstractions Registration) Regulations 2018 (S.I. No. 261 of 2018).

Following hydrostatic testing (6,667,655 litres) this water will be discharged to nearby surface water or to ground, alternatively, it may be removed via tankering. There shall not be discharge of untreated, silty, or contaminated water from the works to any watercourse. The discharge of hydrostatic testing water from the site will be managed and controlled for the duration of the works. All water discharges associated with hydrostatic testing and commissioning will be controlled in terms of timing and flow rate to ensure they do not cause localised flooding, erosion, or mobilisation of sediments. Appropriate mitigation measures will be implemented as required, including attenuation or phased discharge where necessary.

4.1.1.5 Dewatering

Dewatering may be required within the pipe trench to create a dry working environment. Dewatering from the excavations will be managed as required to assist with creating a dry working environment and prevent water flooding the construction site. Construction water will also come from localised pumping of surface water run-off, rainfall, and groundwater ingress in the pipeline trench and launch/receiver shafts during and after heavy rainfall events.

4.1.1.6 Interaction with Flood Zones

Sections of the pipeline route intersect areas identified as being within Flood Zones A and B, most notably at the Yellow River (RVX02) crossing. Construction characteristics relevant to flood risk management include:

- ▶ Avoidance of topsoil stripping within designated flood zones where practicable;
- ▶ Use of trenchless construction beneath river channels in flood-sensitive areas;
- ▶ Use of bog mats and temporary haul roads where required to maintain ground stability; and
- ▶ Programming of works to minimise flood risk exposure.

The implications of these characteristics for flood risk, surface water flow and sediment transport are assessed in the following sections of this chapter.

4.2 Operational Phase

The Proposed Development characteristics which relate to the hydrological and hydrogeological environment during operation are summarised below:

- ▶ Currently, there is no artificial drainage infrastructure within the length of the pipeline route. The site is characterized predominantly as greenfield grassland and hedgerow, therefore at present drainage is predominantly via overland flow to drainage ditches, streams and river watercourses which flow adjacent to or traverse to the site boundary, coupled with drainage to ground whereby surface water and rainfall, is generally percolated to ground through the site via infiltration to grass and soil under the influence of gravity. Drainage along road crossings within the site typically involves overland flow to roadside ditches or gulleys. Given that all trenches established throughout the pipeline to facilitate the proposed pipeline will be fully backfilled and reinstated, drainage along the bulk of the route during the operational phase will persist as it currently/presently does.
- ▶ The proposed underground gas transmission pipeline does not require an operational surface water drainage design, water supply, or wastewater demand.
- ▶ There are no new connections potable water or foul water proposed.
- ▶ The GNI 143 Ballykilleen Pipeline will not alter the existing hardstanding areas, as all trenches established through roads to facilitate the proposed pipeline will be fully backfilled and reinstated).
- ▶ There will be additional hardstanding at the Ballykilleen AGI compound located at the southern end of the pipeline and the Kilwarden Offtake Installation at the northern end of the pipeline. This addition of hardstanding will result in minor localised increased in surface water generation and runoff rate which will drain to the adjacent land and to ground.
- ▶ There incorporation of additional hardstand areas at the Ballykilleen AGI and Kilwarden Offtake Installation will lead to a resultant minor localised decrease in recharge to the aquifer due to the Proposed Development.
- ▶ The Kilwarden Offtake Installation drainage system will allow for removal of surface water from areas of hardstand. A 7.2 m × 3.25 m × 1.6 m soakaway pit will be constructed in the southeastern corner of the compound to facilitate infiltration and manage surface water runoff, this soakaway overflows to an existing drainage ditch along the laneway used to access the site.
- ▶ The proposed Ballykilleen AGI will include a concrete standing area, internal access routes, and a site drainage system connected to the existing Edenderry Renewable Energy Complex stormwater drainage network, in line with agreement between GNI and Bord na Móna. This system will drain stormwater through the existing stormwater drainage network and discharge to the Figile River.
- ▶ There is no required bulk diesel store on site.
- ▶ There is no requirement for abstraction of groundwater during operational phase.
- ▶ Given the nature of the pipeline itself and its purpose for gas transmission, it does not involve foul effluent.
- ▶ There is no abstraction of surface water and no new connections potable water proposed, therefore no potential impacts on surface water resources.

5. ASSESSMENT OF SOURCE-PATHWAY-RECEPTOR (SPR) MODEL

A conceptual site model is developed based on a good understanding of the hydrological and hydrogeological environment, plausible sources of impact and knowledge of receptor requirements. This in turn allows possible Source Pathway Receptor (S-P-R) linkages to be identified. If no S-P-R linkages are identified, then there is no risk to identified receptors.

According to the EPA mapping database, the proposed pipeline route (Site) extends across the 2 WFD Catchments. The entire northern and central portions of the site (Sections 1-5) are located within the Boyne Catchment which resides within Hydrometric Area 07(Catchment Id:07). The southernmost portion of the site (Section 6) is located within the Barrow Catchment which is situated within Hydrometric Area 14 (Catchment Id: 14).

According to the EPA maps, the Proposed Development pipeline route spans across 3 WFD Subcatchment. The northern (Section 1-2), central (Section 3-5) and southern portions (Section 6) of the site lie within the Boyne_SC_030 Subcatchment, Boyne_SC_010 Subcatchment and Figile_SC_010 Subcatchment, respectively. The proposed Temporary Construction Compound 04 is located to the southwest of the pipeline route within the Figile_SC_020 Subcatchment

No significant dewatering is expected. However, depending on the time of year development works are carried out, local minor dewatering may be required during excavation works and groundworks at the proposed development site. This will slightly and temporarily increase the aquifer vulnerability, prior to paving and installation of stormwater drainage and services. However, there is no potential for change in groundwater levels as a result of local changes in the groundwater regime at the site due to the limited extent of the unlikely dewatering activities and the natural recharge capacity of the underlying "Locally Important Aquifer", which allows for the maintenance of groundwater levels. In addition, the mitigation measures that will be implemented during construction (as set out in the CEMP) and operational design measures (SuDS) will ensure there are no potential impacts on the hydrogeological and hydrological environment.

The site is hydrologically connected to the Boyne_040, Boyne_030, YELLOW (CASTLEJORDAN)_030, Boyne_020 and the Figile_030 river waterbodies (all of which traverse the site). The hydrological connectivity to SPA/SAC protected conservation sites via these river waterbodies is outlined / discussed below in Section 5.1.

There are no Recreational Waters or Bathing Waterbodies located in the vicinity of the site.

As stated in Section 2.2 above, the site is underlain by the Athboy GWB, Kilrathmurry Gravels GWB, Trim GWB, Rhodes GWB and Cushina GWB, which has been investigated by the GSI and are described as a which has been investigated by the GSI and as a 'Locally Important Aquifers (LI & Lm)'. The majority of groundwater flow in this aquifer will occur in the top few metres, through the weathered zone in a lateral direction towards rivers and springs, as well as through, joints and fractures, rather than through the rock mass. The hydrogeological connectivity to SPA/SAC protected conservation sites via these groundwater waterbodies is outlined / discussed below in Section 5.2.

If not mitigated, contaminated water can pose a temporary risk to the local drainage network connected to the Boyne_040, Boyne_030, YELLOW (CASTLEJORDAN)_030, Boyne_020, the Figile_030 and the underlying 'Locally Important Aquifers' i.e. Athboy GWB, Kilrathmurry Gravels GWB, Trim GWB, Rhodes GWB and Cushina GWB. However, no impacts on these waterbodies are foreseen based on the low expected loading of any potential contaminant, the expected low interaction between the proposed development and these waterbodies, natural attenuation in the subsoils, and the high level of dilution in the downstream waterbodies.

The proposed development has no foul loading / effluent generation, therefore the Proposed Development will have no connectivity to receptors (surface waterbodies, groundwater bodies or Natura 2000 site) or no potential impact on the overall water quality are anticipated as a result of foul drainage within the local surface water network or the underlying aquifers as defined within the Water Framework Directive.

5.1 Hydrological Connectivity / Pathways

The hydrological Source-Pathway-Receptor (S-P-R) Linkages to sensitive receptors are outlined below:

River Boyne & River Blackwater SAC/SPA

The site currently has a hydrological connection/pathway linkage to River Boyne & River Blackwater SPA / SAC via the following river waterbodies:

- ▶ Boyne_040 (Kinnegad 07 Stream & AGHNAGILLAGH Stream).
- ▶ Boyne_030 (KNOCKERSALLY or COLEHILL Stream / PARK 07 Stream / BALLYNAKIL 07 Stream / CASTLEJORDAN 07 Stream / RAHIN Stream / ROOSK 07 Stream).
- ▶ YELLOW (CASTLEJORDAN)_030 (Yellow [Castlejordan] Stream).
- ▶ Boyne_020 (MOUNTWILSON Stream & Kinnafad Stream).

These waterbodies are primary/secondary tributaries to the River Boyne. They traverse the northern and central portions of the site (Section 1-5) and flow in an alternating east to northeast direction before ultimately merging/joining with the River Boyne, which subsequently discharges to the River Boyne & River Blackwater SPA at a confluence point located approximately 6.2km northeast of the site (linear distance at the point of closest proximity). Such a pathway involves significant mixing and dilution with the named tributaries downstream in the catchment.

The site currently has a **hydrological** linkage / connection to the **downstream / downgradient** River Boyne & River Blackwater SPA (minimum 6.2 km east/northeast of the site) via overland flow, direct runoff and baseflow contributions to the numerous river waterbodies / streams / drainage ditches which traverse the site (mentioned / listed above) and convey flow to the Boyne River waterbody which in turn, ultimately discharges / outfalls The River Boyne & River Blackwater SPA. Albeit this source pathway linkage exists, it involves a significant pathway distance allowing for significant attenuation and a large dilution factor (mixing) downstream in the catchment (multiple tributaries traversing the site and feeding into the Boyne River).

The River Barrow & River Nore SAC

At present, the site has a direct hydrological connection/pathway linkage to The River Barrow & River Nore SAC via the following river waterbodies:

- ▶ BALLYLEAKEN Stream (FIGILE_030).
- ▶ BALLYKILLEEN Stream (FIGILE_030).

These two streams are secondary/tertiary tributaries to the River Figile. They traverse the southern portion of the site (Section 6) and generally flow in a southerly direction before ultimately discharging to the River Figile, which subsequently flows south and outfalls to the River Barrow & River Nore SAC at a confluence point located approximately 16.1km south of the site (linear distance at the point of closest proximity). Such a pathway involves significant mixing and dilution with multiple tributaries downstream in the catchment.

The site also currently has **hydrological** pathway linkage to the **downstream / downgradient** River Barrow & River Nore SAC (16.1km south) via the BallyKilleen Stream which traversed the pipeline route

and joins / merges with the Figile river which subsequently flows south for 16.1km prior to discharge to the SAC.

The AGI located at the southern end of the site – the AGI. The stormwater drainage will connect to an attenuation pond located within the BnM facility. This pond subsequently discharges at a controlled rate into the Figile River post treatment and attenuation at a controlled rate. This represents an indirect **hydrological** Source-Pathway-Receptor linkage to River Barrow & River Nore SAC, albeit via a lengthy pathway distance allowing for significant attenuation and significant level of dilution within the attenuation (drainage design) and downstream in the catchment of the Figile River.

Mount Hevey Bog SAC

The current EPA watercourse mapping indicates that this northern portion of the pipeline which is in close proximity to the Mount Hevey Bog is traversed by 1No. river waterbody. The Kilwarden River (EPA Name: Kinnegad 07) represents the main hydrological feature of this area. The Aghamore 07 Stream flows southwards from its source located in the central portion of the Mount Hevey Bog before it joins / merges with and discharges to the Kilwarden River at a confluence point located c. 1.1km east of the site at the point of closest proximity. From here, the Kilwarden River flows in an easterly direction, traversing the southern portion of this subject section of the pipeline route, to the south of R161. In turn, the Kilwarden River flows in an alternating eastern-southeastern direction prior to discharging to the River Boyne, at a confluence point located c. 4.9km southeast of the site.

The site has no **hydrological** pathway linkage / connection to the Mount Hevey Bog SAC, as this natura 2000 conservation site is located **hydrologically upgradient / upstream** of the proposed development site.

The Long Derries, Edenderry SAC

The Long Derries, Edenderry SAC is located c. 3.8 km east of Section 6 of the site at the point of closest proximity. However, the site shares no hydrological pathway linkage / connection to this SAC, as this Natura 2000 conservation site is located hydrologically upgradient / upstream of the subject development site and thus no potential to be impacted by the proposed development.

The Grand Canal pNHA (proposed National Heritage Area)

The Grand Canal pNHA, traverses / intersects the site at chainage Section 5, however the canal is a fully lined feature, therefore negating any **hydrological** connectivity or pathway to this waterbody.

5.2 Hydrogeological Connectivity / Pathways

The hydrogeological Source-Pathway-Receptor (S-P-R) Linkages to sensitive receptors are outlined below:

River Boyne & River Blackwater SAC/SPA

Currently, the site has a no potential for a **hydrogeological** (groundwater) connection to **downstream / downgradient** River Boyne & River Blackwater SPA, due to the distance of separation (minimum 6.2km east) being greater/larger than the distance of local underground flow paths within the multiple aquifers beneath the site. The vertical migration to the underlying bedrock is minimised due to the low permeability nature of the majority of overburden, which is characteristic of cohesive glacial clays, thereby further reducing/decreasing the potential for a hydrogeological linkage pathway to the sensitive receptors. While some higher permeability granular deposits (e.g. Gravels and alluvium) exist, these are discontinuous and confined by the surrounding cohesive Till deposits which, combined with the predominant moderate vulnerability (5-10m+ overburden thickness) negates the potential of offsite vertical and lateral migration.

The River Barrow & River Nore SAC

At present, the site has a no potential for a **hydrogeological** (groundwater) connection to the **downstream / downgradient** River Barrow & River Nore SAC, due to the distance of separation (minimum 16.1km south) being greater/larger than the distance of local underground flow paths within the multiple aquifers beneath the site. The vertical migration to the underlying bedrock is minimised due to the low permeability nature of the majority of overburden, which is characteristic of cohesive glacial clays, thereby further negating the potential for a hydrogeological linkage pathway to the sensitive receptors. While some higher permeability granular deposits (e.g. Gravels and alluvium) exist, these are discontinuous and confined by the surrounding cohesive Til deposits which, combined with the predominant moderate vulnerability (5-10m+ overburden thickness) negates the potential of offsite vertical and lateral migration.

Mount Hevey Bog SAC

The Mount Hevey Bog SAC occupies a topographically elevated position relative to the works area, and both groundwater and surface water flow direction are likely away from the SAC. A Source-Pathway Receptor (SPR) risk assessment was undertaken for the construction phase. Risks to the Mount Hevey Bog SAC was assessed as negligible to low risk, due to limited aquifer productivity, cohesive overburden, short groundwater flow paths and likely absence of hydraulic connectivity with the SAC (Minerex Environmental Limited (MEL), 2026)

The proposed development site has a low potential for a hydrogeological connection / linkage with the nearby upstream / upgradient Mount Hevey Bog SAC (20m north) designated sites, due to underground flow path distances in the locally important aquifer, which is characterised by low fracture connectivity, discrete local fracturing with little connectivity rather than large, well-connected fractures which are more indicative of Regional Aquifers. Such a hydrogeological linkage / connection does involve a significant dilution factor downgradient in the aquifer (Athboy GWB, Section 1 Chainage of the site pipeline route). Additionally, vertical migration to the underlying bedrock is minimised where overburden soil cover in Section 1 has low permeability, typical of the Tils derived from Limestone and Cut over raised Bog which is present in this area of the site, resulting in good natural aquifer protection from any localised diesel/fuel oil spills during either construction or operational phases thereby further negating the potential for a hydrogeological linkage pathway to this sensitive receptors. There are no groundwater dependent wetlands within the downstream zone of influence of the proposed development.

The Long Derries, Edenderry SAC

The Long Derries, Edenderry SAC is located c. 3.8 km east of Section 6 of the site at the point of closest proximity. At present, the site has a no potential for a **hydrogeological** (groundwater) connection to the **downstream / downgradient** Long Derries, Edenderry SAC, due to the distance of separation (minimum 3.8 km east) being greater/larger than the distance of local underground flow paths typical of the aquifers beneath the site. The vertical migration to the underlying bedrock is minimised due to the low permeability nature of the majority of overburden, which is characteristic of cohesive glacial clays, thereby further negating the potential for a hydrogeological linkage pathway to the sensitive receptors.

The Grand Canal pNHA (proposed National Heritage Area)

The Grand Canal pNHA, traverses / intersects the site at chainage Section 5, however the canal is a fully lined feature, therefore negating any **hydrogeological** connectivity or pathway to this waterbody. Table 5-1 below describes the S-P-R model for the proposed development site and includes the robust mitigation and design measures which will be incorporated into the proposed development throughout the construction phases.

Table 5-1 Pollutant Linkage (S-P-R) Assessment

Source	Pathway	Receptor	Risk of Impact	Mitigation/Design Measures
Construction Impacts (summary)				
<p>Unmitigated leak from an oil tank to ground (1,000 litres worst case scenario).</p> <p>Discharge of runoff water with:</p> <ul style="list-style-type: none"> • High pH from cement process. • Hydrocarbons from construction vehicles. • Run-off containing a high concentration of suspended solids during excavation and open cut trenching. • Drilling fluid from trenchless drilling • Run-off from potentially contaminated stockpile soils 	<p>Vertical migration through contaminated overburden to underlying "Locally Important Aquifer" (LI & Lm), classified by the GSI as having predominantly 'Moderate' to 'High' vulnerability, and some minor localised areas of 'Low' and 'Extreme' vulnerability.</p> <p>Excavations will temporarily increase the aquifer vulnerability.</p> <p>Lateral migration via groundwater within the underlying bedrock aquifers to the hydrological and hydrogeological environment i.e. Boyne_040, Boyne_030, YELLOW (CASTLEJORDAN)_030, Boyne_020 and the Figile_030</p>	<p>Underlying 'Locally Important Aquifer' Bedrock (and Gravel) Aquifer' (Athboy GWB, Kilrathmurry Gravels GWB, Trim GWB, Rhodes GWB and Cushina GWB).</p> <p>The river waterbodies which traverse the site; Boyne_040, Boyne_030, YELLOW (CASTLEJORDAN)_030, Boyne_020 and the Figile_030.</p> <p>The River Boyne & River Blackwater SPA / SAC, The River Barrow & River Nore SAC, & Mount Hevey Bog SAC.</p>	<p>No likely impact on the status of the multiple GWB's (Locally Important Aquifer) due to low potential loading, shallow depth of excavations, reinstatement and mitigation measures during construction (refer to CEMP).</p> <p>No likely impacts on the status of the Surface Waterbodies (rivers and streams) due to low potential loading, natural attenuation in the subsoils, and the high level of dilution in the downstream waterbodies, in addition to mitigation measures in place (refer to CEMP).</p>	<p>Only potential for temporary impacts due to accidental releases. Mitigation measures outlined in a CEMP which will be a live document. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the CEMP and any subsequent conditions relevant to the proposed development. These include management of soils, re-fuelling of machinery and chemical handling, control of water during the construction phase and treatment of discharge water where required.</p>

Source	Pathway	Receptor	Risk of Impact	Mitigation/Design Measures
Operational Impacts (summary)				
<p>Discharge to ground of hydrocarbons from roads, car parking, and hardstanding areas and maintenance related works.</p>	<p>Indirect pathway through stormwater drainage to the Boyne_040 (near offtake installation) and Figile_030 (near AGI compound).</p> <p>Direct pathway to Boyne_040, Boyne_030, YELLOW (CASTLEJORDAN)_030, Boyne_020 (maintenance related works)</p> <p>Lateral migration via groundwater within the underlying 'Locally Important' Bedrock (and gravel) Aquifer to the hydrological environment i.e. river waterbodies including the Boyne_040, Boyne_030, YELLOW (CASTLEJORDAN)_030, Boyne_020 and the Figile_030.</p>	<p>Underlying 'Locally Important Aquifer' Bedrock (and Gravel) Aquifer' (Athboy GWB, Kilrathmurry Gravels GWB, Trim GWB, Rhodes GWB and Cushina GWB).</p> <p>The river waterbodies which traverse the site; Boyne_040, Boyne_030, YELLOW (CASTLEJORDAN)_030, Boyne_020 and the Figile_030</p> <p>The River Boyne & River Blackwater SPA / SAC, The River Barrow & River Nore SAC, & Mount Hevey Bog SAC.</p>	<p>No perceptible risk due to the implementation of the design measures which includes SuDS and the use of interceptors (at AGI compound) along the drainage system. Furthermore, the extent of loading of potential contaminant, distance between the source and the receptors along with significant dilution downstream in the drainage network / catchment will ensure any released hydrocarbons and other contaminants are at background levels (i.e., with no likely impact above water quality objectives as outlined in S.I. No. 272 of 2009, S.I. No. 386 of 2015 and S.I. No. 77 of 2019).</p>	<p>The proposed development is designed to ensure the protection of the hydrological and hydrogeological environment by incorporating SuDS measures in design at the proposed hardstanding locations (refer to Section 4.2 above).</p>

Source	Pathway	Receptor	Risk of Impact	Mitigation/Design Measures
<p>The proposed development has no foul loading / effluent generation or discharge, therefore the Proposed Development will have no impact on the overall water quality as a result of foul drainage within the local surface water network or the underlying aquifer as defined within the Water Framework Directive.</p>	<p>No pathway associated with foul / wastewater.</p>	<p>No receptor are identified in association with foul/wastewater in the absence of a pathway.</p>	<p>No perceptible risk to the hydrological or hydrogeological environment given the proposed development has no foul loading / effluent generation or discharge, therefore the Proposed Development will have no impact on the overall water quality as a result of foul drainage within the local surface water network or the underlying aquifer as defined within the Water Framework Directive.</p>	<p>No mitigations or design measures required in relation to foul/wastewater given the proposed development has no foul loading / effluent generation or discharge</p>

6. NO-DETERIORATION ASSESSMENT

6.1 Hydrological Environment

As stated in Section 5 above, the site currently has a direct hydrological connection to the Boyne_040, Boyne_030, YELLOW (CASTLEJORDAN)_030, Boyne_020 and the Figile_030, all of which traverse the site.

This is a lengthy hydrological pathway to protected natura 2000 European Sites, thereby allowing significant time for settlement and dilution, should an accidental release (even without mitigation) to surface water occur. Therefore, no potential impacts are anticipated during construction and operation in the receiving waterbodies.

There is no hydrological connection/pathway with any WFD waterbodies via foul effluent as the site is not anticipated to connect to any foul sewers or WWTP facilities, subsequently no potential impacts are anticipated on the local waterbodies.

During construction, there are mitigation and design measures which will be implemented to protect the hydrological (and hydrogeological) environment. There is a potential of accidental discharges should mitigation fail during the construction phase, however these are temporary short-lived events that will not impact on the water status of waterbodies long-term and as such will not impact on trends in water quality and over all status assessment. This is based on the low expected loading of any potential contaminant, natural attenuation in the subsoils, the expected low interaction between the proposed development and these waterbodies and the high level of dilution in the downstream waterbodies / catchment. As such, there is no potential for any accidental release into the aforementioned river waterbodies and the Proposed Development will not cause any significant deterioration or change in water quality status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the third cycle river basin management plan (2022-2027) i.e. Water Action Plan 2025 - A River Basin Management Plan for Ireland

Nevertheless, the project-specific Construction and Environmental Management Plan (CEMP) which the works contractor will develop will implement strict mitigation measures to ensure the protection of the hydrological (and hydrogeological) environment during construction which will ensure that there will be no negative impact on the quantitative or qualitative or morphology of the nearby watercourses.

During the operational phase, the proposed Development would have an indirect hydrological connection with the Figile_030 River Waterbody. The proposed stormwater system for the AGI is discharging to the existing stormwater and attenuation system for the Edenderry Renewable Energy Complex, ultimately discharging to the Figile river. The proposed development following reinstatement has no surface water discharge or hydrological connection to the Boyne_040, Boyne_030, YELLOW (CASTLEJORDAN)_030, or the Boyne_020 during the operational phase.

During operation, in the scenario of an unmitigated leak of fuel from car park areas and roads, these are temporary short-lived events that will not impact on the status of the waterbodies mentioned above in the long-term. This is based on the low expected loading of any potential contaminant, natural attenuation in the subsoils, and the high level of dilution in the downstream waterbodies.

However, to mitigate potential contamination from surface water runoff, which may originate from roads, car parks and hardstanding areas, a sustainable urban drainage system (SuDS) will be implemented at hardstand areas (refer to Section 4.2 above, which details such proposed design measures). This system is designed to minimize the risk of contaminants, such as hydrocarbons, entering the stormwater drainage network and subsequently impacting surface waterbodies downstream (the Boyne_040, Boyne_030, YELLOW (CASTLEJORDAN)_030, Boyne_020 and the Figile_030); as well as groundwater bodies underlying the site i.e. Athboy GWB, Kilrathmurry Gravels GWB, Trim GWB, Rhodes GWB and Cushina GWB

In relation to the minor hardstanding areas at the offtake installation and AGI locations, the surface water drainage strategy integrates various SuDS measures, including permeable paving, attenuation system, and petrol interceptors. These features will effectively manage surface water flows, directing them to the attenuation system / soakaway to maximize their storage potential.

The SuDS and proposed measures have been designed in detail with the ultimate aim of protecting the hydrological (& hydrogeological) environment.

There are no proposed diversions of any drainage ditches or waterbodies as part of the proposed development.

Overall, the potential effects on the current status of the surface waterbodies are considered *no impact i.e. no change to the WFD status or elements in terms of the hydrological environment.*

6.2 Hydrogeological Environment

No significant dewatering is expected. However, depending on the time of year development works are carried out, local minor dewatering may be required during excavation of topsoil materials associated and groundworks at the proposed development site. This will slightly and temporarily increase the aquifer vulnerability, which is classified by the GSI as having predominantly 'Moderate' to 'High' vulnerability and some minor localised areas of 'Low' and 'Extreme' vulnerability, prior to paving and installation of stormwater drainage and services.

This minor dewatering would be perched water within the overburden layer composed of low permeable glacial tills. Therefore, groundwater is not anticipated to be encountered during the minor shallow excavation works projected at this location.

There is no potential for change in groundwater levels as a result of local changes in the groundwater regime at the site due to the limited extent of the unlikely dewatering activities and the natural recharge capacity of the underlying 'Locally Important Aquifer (LI & Lm)', which allows for the maintenance of groundwater levels. In addition, the mitigation measures that will be implemented during construction (as set out in the CEMP) and operational design measures (SuDS) will ensure there are no potential impacts on the hydrogeological and hydrological environment.

Therefore, there is no potential for change in water quality or levels as a result of local changes in the groundwater regime at the site. There are no planned discharges to groundwater during the operational phase and no long-term groundwater dewatering for the project. The proposed development design includes hardstand cover across the site.

During construction, there is limited potential of accidental discharges. However, should these occur they are temporary short-lived events that will not impact on the water status of the underlying bedrock aquifers long-term and as such will not impact on trends in water quality and over all status assessment. The project-specific Construction and Environmental Management Plan (CEMP), which the works contractor will develop will implement strict mitigation measures to ensure the protection of the hydrogeological environment during construction which will ensure that there will be no negative impact on the quantitative or qualitative of the underlying gravel and bedrock aquifers.

In terms of the operational phase, the risk to the aquifer is considered to be low due to the presence of handstand and a drainage system incorporating use of hydrocarbon / petrol interceptors (or equivalent) on the stormwater drainage system prior to discharge from the site.

Overall, the potential effects on the WFD status to the groundwater bodies are considered no impact *i.e., no change to the current status or elements in terms of the underlying hydrogeological environment.*

6.3 Assessment in Terms of Future Good Status

Refer to Section 3 (Section 3.1-3.10) for the respective WFD status (2019-2024), Risk Scores (3rd Cycle) and main pressures identified on the corresponding Surface (River) Waterbodies and Groundwater Bodies according to the EPA (2025) and corresponding/respective Subcatchment reports.

At present there are no local targeted measures within the catchment to maintain or achieve improvements to the status of the water bodies. However, the following are some pressures associated with waterbody catchments:

- ▶ Physical Modifications.
- ▶ Management of pollution from agricultural activities.
- ▶ Management of pollution from sewage and waste water.
- ▶ Management of pollution from urban environments.
- ▶ Changes to natural flow and levels of water.
- ▶ Managing invasive non-native species.

The proposed development will incorporate SuDs measures within the landscape and drainage design in order to manage run-off quality and foul sewers management will be in compliance with UÉ specifications. No dewatering is required during operation. All discharges will be adequately treated through the proposed SuDs measures as outlined in Section 0 above. As such there will be no change to the existing status as a result of the proposed development.

Based on the above information it is *not* considered that any aspects of the proposed development will prevent the WFD objectives from being achieved or to meet the requirements and/or objectives in the Water Action Plan 2024 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024).

7. CONCLUSIONS

Appendix A contains the background information and the WFD classification elements for surface water and groundwater body status. The colour coded system referred to in Appendix A, is used in Appendix B – Table 1 and Table 2 to give a visual impression of the surface water and groundwater assessment, respectively

The WFD assessment indicates that, based on the current understanding of the proposed development, there is no potential for adverse or minor temporary/ long-term or localised effects on the Boyne_040, Boyne_030, YELLOW (CASTLEJORDAN)_030, Boyne_020 or the Figile_030.

Therefore, it has been assessed that the proposed development will not cause any significant deterioration or change in water body status or prevent attainment, or potential to achieve, future good status or to meet the requirements and/or objectives in the Water Action Plan 2024 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024).

The WFD assessment indicates that there is no potential for adverse or minor temporary or localised effects on the Athboy GWB, Kilrathmurry Gravels GWB, Trim GWB, Rhodes GWB or Cushina GWB. Therefore, it has been assessed that it is unlikely that the proposed development will cause any significant deterioration or change on its water body status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the Water Action Plan 2024 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024).

No further assessment of WFD is recommended given that no significant deterioration or change in water body status is expected based on the current understanding of the proposed development during construction and operation.

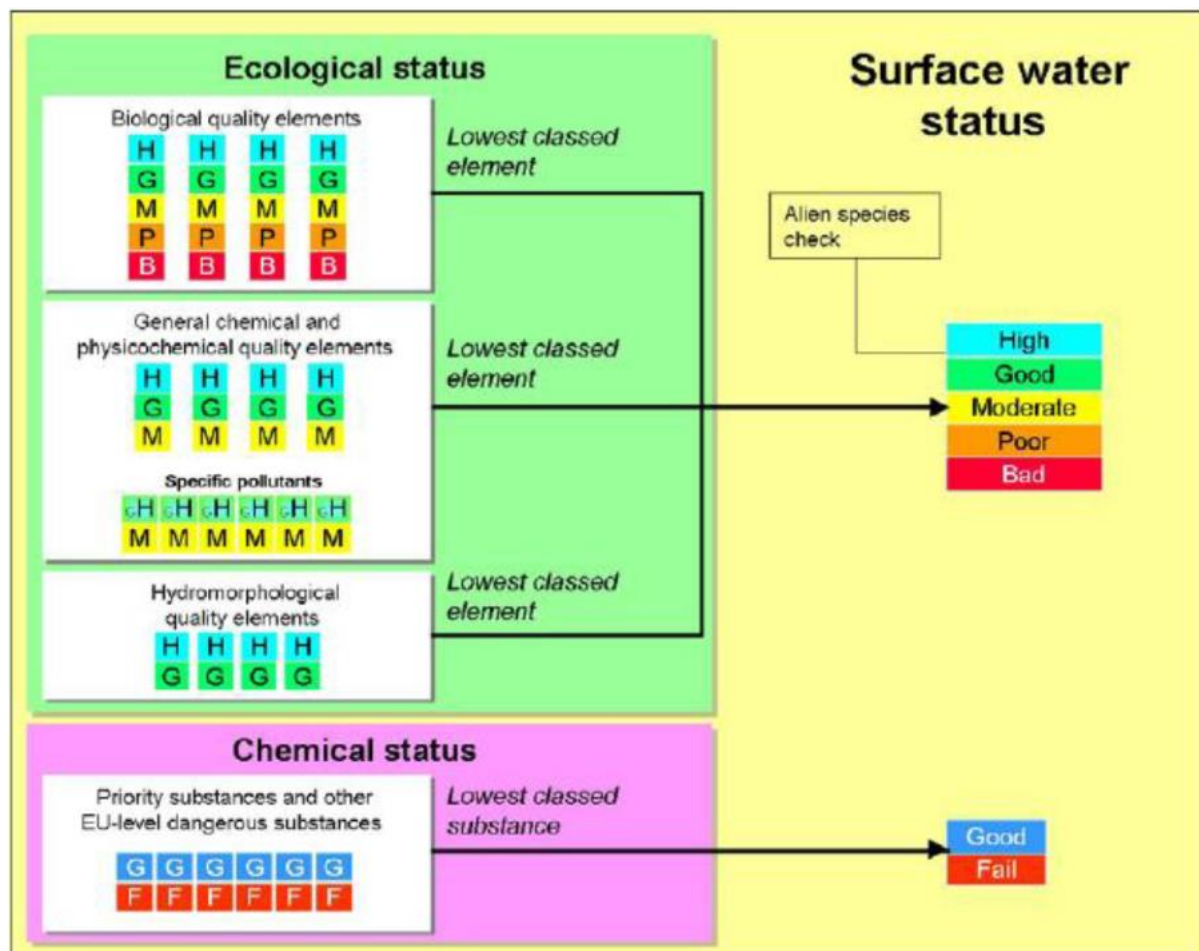
APPENDIX A. WFD ASSESSMENT MATRIX

WATER FRAMEWORK DIRECTIVE ASSESSMENT MATRIX

1.1 Background to Surface Water Body Status & Groundwater Body Status

Under the WFD, surface water body status is classified on the basis of chemical and ecological status or potential. Ecological status is assigned to surface water bodies that are natural and considered by the EPA not to have been significantly modified for anthropogenic purposes (i.e., culverting). Ecological potential is assigned to artificial and man-made water bodies (such as canals), or natural water bodies that have undergone significant modification. The term 'ecological potential' is used as it may be impossible to achieve good ecological status because of modification for a specific use, such as navigation or flood protection. The ecological potential represents the degree to which the quality of the water body approaches the maximum it could achieve. The worst-case classification is assigned as the overall surface water body status, in a 'one-out all-out' system (i.e., by taking the worst case of all the combined risk outcomes). This system is summarised below in Figure 1.

Figure 1. WFD classification elements for surface water body status (Environmental Agency, 2015)



1.1.2 Chemical Status

Chemical status is defined by compliance with environmental standards for chemicals that are priority substances and/or priority hazardous substances, in accordance with the Environmental Quality Standards Directive (2008/105/EC). This is assigned on a scale of good or fail. Surface water bodies are

only monitored for priority substances where there are known discharges of these pollutants; otherwise, surface water bodies are reported as being at good chemical status.

1.1.3 Ecological Status

Ecological status or potential is defined by the overall health or condition of the watercourse. This is assigned on a scale of High, Good, Moderate, Poor or Bad, and on the basis of four classification elements or 'tests', as follows:

- **Biological:** This test is designed to assess the status indicated by a biological quality element such as the abundance of fish, invertebrates or algae and by the presence of invasive species. The biological quality elements can influence an overall water body status from Bad through to High.
- **Physico-chemical:** This test is designed to assess compliance with environmental standards for supporting physicochemical conditions, such as dissolved oxygen, phosphorus and ammonia. The physicochemical elements can only influence an overall water body status from Moderate through to High.
- **Specific pollutants:** This test is designed to assess compliance with environmental standards for concentrations of specific pollutants, such as zinc, cypermethrin or arsenic. As with the physico-chemical test, the specific pollutant assessment can only influence an overall water body status from Moderate through to High.
- **Hydromorphology:** For natural waterbodies, this test is undertaken when the biological and physicochemical tests indicate that a water body may be of High status. It specifically assesses elements such as water flow, sediment composition and movement, continuity, and structure of the habitat against reference or 'largely undisturbed' conditions. If the hydromorphological elements do not support High status, then the status of the water body is limited to Good overall status. For artificial or highly modified waterbodies, hydromorphological elements are assessed initially to determine which of the biological and physico-chemical elements should be used in the classification of ecological potential. In all cases, assessment of baseline hydromorphological conditions are an important factor in determining possible reasons for classifying biological and physicochemical elements of a water body as less than Good, and hence in determining what mitigation measures may be required to address these failing water bodies.

1.2 Background to Groundwater Body Status

Under the WFD, groundwater body status is classified on the basis of quantitative and chemical status. Status is assessed primarily using data collected from the EPA monitoring network; therefore, the scale of assessment means that groundwater status is mainly influenced by larger scale effects such as significant abstraction or widespread/ diffuse pollution. The worst-case classification is assigned as the overall groundwater body status, in a 'one-out all-out' system. This system is summarised in Figure 2 below.

1.2.1 Quantitative Status

Quantitative status is defined by the quantity of groundwater available as baseflow to watercourses and water-dependent ecosystems, and as 'resource' available for use as drinking water and other consumptive purposes. This is assigned on a scale of Good or Poor, and on the basis of four classification elements or 'tests' as follows:

- **Saline or other intrusions:** This test is designed to identify groundwater bodies where the intrusion of poor quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.
- **Surface water:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the ecological status of associated surface water bodies.

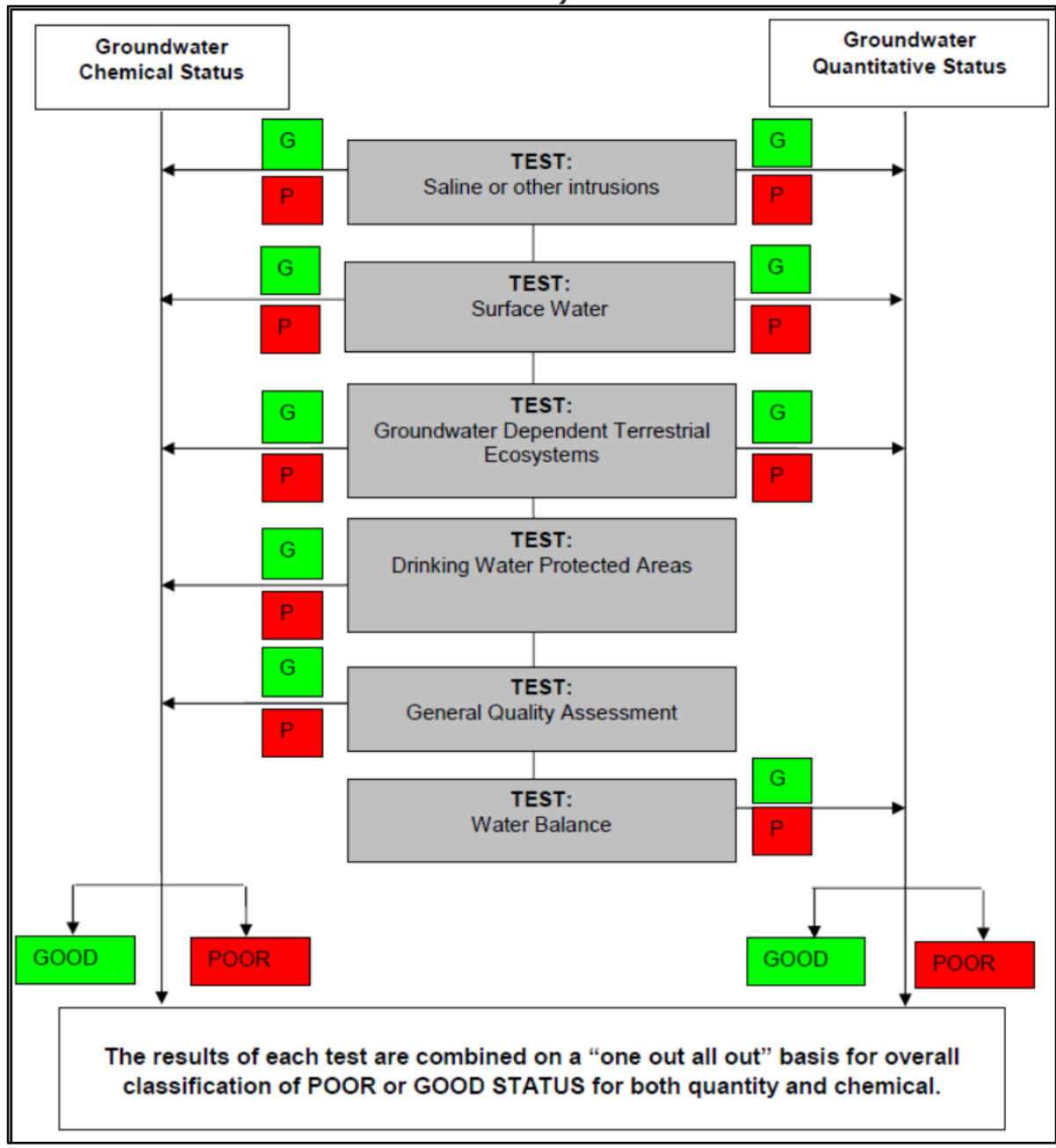
- **Groundwater Dependent Terrestrial Ecosystems (GWDTEs):** This test is designed to identify groundwater bodies where groundwater abstraction is leading to “significant damage” to associated GWDTEs (with respect to water quantity).
- **Water balance:** This test is designed to identify groundwater bodies where groundwater abstraction exceeds the “available groundwater resource”, defined as the rate of overall recharge to the groundwater body itself, as well as the rate of flow required to meet the ecological needs of associated surface water bodies and GWDTEs.

1.2.2 Chemical Status

Chemical status is defined by the concentrations of a range of key pollutants, by the quality of groundwater feeding into watercourses and water-dependent ecosystems and by the quality of groundwater available for drinking water purposes. This is assigned on a scale of Good or Poor, and on the basis of five classification elements or ‘tests’ as follows:

- **Saline or other intrusions:** This test is designed to identify groundwater bodies where the intrusion of poor-quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.
- **Surface water:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the chemical status of associated surface water bodies.
- **GWDTEs:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to “significant damage” to associated GWDTE’s (with respect to water quality).
- **Drinking Water Protected Areas (DrWPAs):** This test is designed to identify groundwater bodies failing to meet the DrWPA objectives defined in Article 7 of the WFD or at risk of failing in the future.
- **General quality assessment:** This test is designed to identify groundwater bodies where widespread deterioration in quality has or will compromise the strategic use of groundwater.

Figure 2. WFD classification elements for groundwater body status (Environmental Agency, 2015)



APPENDIX B. NON-DETERIORATION ASSESSMENT

Table 1 - Risk screening of potential to cause deterioration of current WFD status										
	Surface Water	Scheme Elements	Proposed Development						Mitigation Measures	Overall Impact with mitigation measures
	Boyne_040 (IE_EA_07B040600) Boyne_030 (IE_EA_07B040400) YELLOW (CASTLEJORDAN)_030 (IE_EA_07Y020300) Boyne_020 (IE_EA_07B040300) Figile_030 (IE_SE_14F010200)		Phase (Construction/ Operation)	Construction	Construction	Construction	Construction	Operation		
		Identified Quantitative Impacts	Increased run-off and sediment loading	Temporary land-take during the construction phase	Pollution due to accidental discharges or spillages during the construction phase	Release of sediments, pollutants and construction material during Bridge construction.	Increase in Hardstanding	Pollution due to accidental discharges or spillages from car parks and hardstanding areas during the operation phase		
WFD Status	Macrophytes and phytoplankton - combined	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	Construction: The project-specific CEMP will include robust mitigation measures to protect the hydrological environment. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent conditions relevant to the proposed development. These include management of soils, re-fuelling machinery and chemical handling and control of water during the construction phase.	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Macroinvertebrates		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Fish		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
Physio-Chemical Status	Total Ammonia	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	Operation: The proposed development is designed to ensure the protection of the hydrological environment such as delivery and distribution and use of oil interceptors on the stormwater system and the use of SuDS techniques. In order to limit the surface water discharge from the site to pre-development, greenfield rates, and to ensure improvement in the overall surface water quality before ultimate discharge the principles of Sustainable Drainage Systems, (SuDS) are to be implemented. There is no generation of foul / wastewater effluent associated with the development	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Total Nitrogen		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Ortho-Phosphate		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
Hydromorphological Elements	Quantity and dynamics of river flow	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	Operation: The proposed development is designed to ensure the protection of the hydrological environment such as delivery and distribution and use of oil interceptors on the stormwater system and the use of SuDS techniques. In order to limit the surface water discharge from the site to pre-development, greenfield rates, and to ensure improvement in the overall surface water quality before ultimate discharge the principles of Sustainable Drainage Systems, (SuDS) are to be implemented. There is no generation of foul / wastewater effluent associated with the development	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Connection to Groundwater		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	River continuity		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	River depth and width variation bed		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Structure and substrate of river bed		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Structure of riparian zone		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status

Table 2 – Risk screening of potential to cause deterioration of current WFD status

	Groundwater Atkley GWB (IE_EA_G_001) Kilrathmerry Gravel GWB (IE_EA_G_044) Trim GWB (IE_EA_G_002) Rhufo GWB (IE_SE_G_116) Corkina GWB (IE_SE_G_048)	Scheme Elements	Proposed Development				Mitigation Measures	Overall Impact	
		Phase (Construction/ Operation)	Construction	Construction	Construction	Operation			Operation
		Identified Quantitative Impacts	Increased run-off and sediment loading	Release of sediments, pollutants and construction material during Bridge construction.	Pollution due to accidental discharges or spillages during the construction phase	Increase in Hardstanding			Pollution due to accidental discharges or spillages from car parks and hardstanding areas during the operation
Quantitative Elements	Saline or other intrusions. To identify groundwater bodies where the intrusion of poor quality water as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	<p>Construction: The project-specific CEMP will include robust mitigation measures to protect the underlying hydrogeological environment. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent conditions relevant to the proposed development. These include management of soils, re-fuelling machinery and chemical handling and control of water during the construction phase. No significant dewatering is required which could impact on quantitative status.</p> <p>Operation: The proposed development is designed to ensure the protection of the underlying hydrogeological environment such as use of hydrocarbon interceptors on the stormwater system and prior to discharge from the site and the use of SuDS techniques. In order to limit the surface water discharge from the site to pre-development, greenfield rates, and to ensure improvement in the overall surface water quality before ultimate discharge the principles of Sustainable Drainage Systems, (SuDS) are to be implemented. The proposed development does not include foul / wastewater loading / effluent generation therefore no connection to any WWT facility is required.</p>	
	Surface water. To assess the impact of groundwater abstractions on the ecological status of surface water bodies.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		
	Groundwater Dependent Terrestrial Ecosystems (GWDTE's) To assess the impact of groundwater abstractions on the condition of GWDTE'S.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		
	Water balance To identify groundwater bodies where abstractions exceed the available resource.		Not Applicable (no dewatering anticipated)	Not Applicable (no dewatering anticipated)	Not Applicable (no dewatering anticipated)	Not Applicable (no water supply from borehole anticipated)	Not Applicable (no water supply from borehole anticipated)		
Chemical Elements	Saline or other intrusions. To identify groundwater bodies where the intrusion of poor quality water as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	<p>No anticipated impacts to the hydrological environment with no deterioration to the WFD Status</p> <p>No anticipated impacts to the hydrological environment with no deterioration to the WFD Status</p> <p>No anticipated impacts to the hydrological environment with no deterioration to the WFD Status</p> <p>No anticipated impacts to the hydrological environment with no deterioration to the WFD Status</p> <p>No anticipated impacts to the hydrological environment with no deterioration to the WFD Status</p>	
	Surface water. To assess the impact of groundwater abstractions on the ecological status of surface water bodies.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		
	Groundwater Dependent Terrestrial Ecosystems (GWDTE's) To assess the impact of nutrient concentrations in groundwater (primarily phosphates) on GWDTE's.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		
	Drinking Water Protected Areas (DrWPAs) To identify groundwater bodies failing to meet the DrWPA objectives defined in Article 7 of the WFD or at risk of failing in the future.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		
	General quality assessment To identify groundwater bodies where widespread deterioration in quality has or will compromise the strategic use of groundwater.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		