LARGE-SCALE RESIDENTIAL DEVELOPMENT AT GLENAMUCK NORTH, KILTERNAN, DUBLIN 18

Water Framework Directive Assessment

Durkan Carrickmines Developments Limited

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Water Framework Directive Assessment

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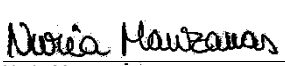	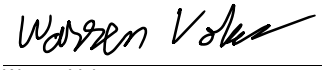	
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1 INTRODUCTION

DNV was commissioned by Thornton O' Connor, on behalf of Durkan Carrickmines Developments Limited (the Applicant) to undertake a Water Framework Directive (WFD) Assessment in support of a proposed Large-scale Residential Development (LRD) (hereafter referred to as the 'Proposed Development') at Glenamuck North, Kilternan, Dublin 18 (hereafter referred to as the 'site').

This report presents the findings of the WFD Assessment for the site and Proposed Development.

1.1 Project Objective

The overall objective of this WFD assessment is to determine if any specific components or activities associated with the Proposed Development will compromise WFD Article 4 objectives, cause a deterioration in the status of any surface water or groundwater body and/or jeopardise the attainment of good surface water or groundwater status.

This assessment also aims to identify any waterbodies with the potential to be impacted, describe the proposed mitigation measures if required and define any residual potential impacts.

1.2 Project Scope of Work

The scope of this WFD assessment included the following tasks in line with WFD Common Implementation Strategy (CIS) Guidance:

- Screening for Potential Effects - Determine whether the Proposed Development could have any direct or indirect effect on the different quality elements relevant to the WFD;
- Scoping of Further Investigations - Outline the information required to determine the significance of any effect on the relevant quality elements; and,
- Data Collection and Assessment - Assess whether any effect could cause deterioration or compromise the status/potential status of a water body.

This assessment is reliant on the design information for the Proposed Development provided by the Applicant.

1.3 Professional Competency

The report was prepared by Nuria Manzanas, a Principal Consultant of DNV. Nuria is a Chartered Geologist (PGeo) with the Institute of Geologists Ireland (IGI) with 12 years' experience in preparing environmental and hydrogeological assessments for a range of project types and geological and hydrogeological site settings.

The report was reviewed by Warren Vokes, Ba MSc MCIWEM C.WEM, a Senior Consultant of DNV. Warren is a Chartered Water and Environmental Manager with over 10 years' experience in preparing environmental and hydrological assessments.

The report was approved by Patrick Higgins BSc MSc, MIEnvSc CEnv, a Technical Director at DNV. Patrick is a Chartered Environmentalist (CEnv) with the Institute of Environmental Sciences (IES) with over 21 years' experience in preparing environmental and hydrogeological assessments for a range of project types and geological and hydrogeological site settings.

2 METHODOLOGY

2.1 Legislative Context

The EU Water Framework Directive (2000/60/EC), as amended by Directives 2008/105/EC, 2013/39/EU, and 2014/101/EU ("WFD"), was established to ensure the protection of the water environment. The Directive was transposed in Ireland by the European Communities (EU) (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) with regard to the Common Implementation Strategy for the Water Framework Directive and the Floods Directive (EU Water Directors, 2016).

The WFD requires that all member states protect and improve water quality in all waters, with the aim of achieving good status, a condition where waterbodies meet defined ecological and chemical quality standards, by 2027 at the latest. It applies to all surface waters (defined as inland waters, both standing and flowing and includes rivers, lakes, reservoirs, streams and canals), groundwater, transitional (estuarine) and coastal waters. This includes both natural and "artificial and heavily modified bodies of water" ('artificial' is defined in Article 2(8) as 'a body of surface water created by human activity' and 'heavily modified' is defined in Article 2(9) as 'a body of surface water which as a result of physical alternations by human activity is substantially changed in character').

The WFD Article 4 objectives, which have been considered as part of the design process of the Proposed Development, include the following:

- Protect, enhance, and restore all bodies of surface water and groundwater with the aim of achieving good surface water status by 2027.
- Prevent deterioration and maintain a 'high' status where it already exists.
- Implement the necessary measures with the aim of progressively reducing pollution in surface waters and groundwater; and
- Ensure waters in protected areas meet requirements.

2.1.1 National Policy

The WFD is implemented through the River Basin Management Plans (RBMP) and which operate on a renewing six-year cycle of planning, action, and review. RBMPs set targets to address water quality issues including the identification of river basin districts, water bodies, protected areas, and any pressures or risks, monitoring, and setting environmental objectives. In Ireland, the first RBMP covered the period from 2009 to 2015, with the second cycle plan covering the period from 2018 to 2021.

The Water Action Plan 2024 (RBMP 3rd Cycle – 2022-2027) Programme of Measures outlines comprehensive measures to protect and improve water quality across various sectors. The Programme of Measures (PoM) for the RBMP is a set of actions designed to achieve the environmental objectives set out in the WFD. The PoM includes both broad measures applicable at a national scale and supplementary measures applicable to only specific catchments:

Key elements of the PoM include:

- Integrated Catchment Management: The PoM uses an integrated catchment management approach, focusing on identifying the right measures for specific locations to maximise effectiveness;
- Collaboration: Implementation involves collaboration between various government departments, local authorities, the EPA, and other stakeholders, with the Programme Delivery Office overseeing and coordinating efforts;

- Monitoring and Reporting: An enhanced monitoring and reporting programme tracks the implementation progress and assesses the effectiveness of the measures;
- Targeted Actions: The PoM identifies specific actions under each pressure/issue affecting water quality, assigning lead organisations, timelines, and key performance indicators;
- Multiple Benefits: The PoM aims to deliver multiple benefits for water, biodiversity, and climate change mitigation and adaptation; and
- Environmental Assessment: All measures and projects arising during the third-cycle RBMP are subject to further environmental assessments, including Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA), as required.

The Water Action Plan 2024 provides numerous specific examples of measures within the PoM, categorised by the sector driving the impact:

- Agriculture: Implementation of a stronger and more targeted Nitrates Action Programme, including tighter controls on nutrient applications, a livestock excretion banding system, a national fertiliser sales database, and enhanced inspection and enforcement programmes;
- Hydromorphology: Developing a new Controlled Activities for the Protection of Waters regime to address pressures on the physical condition of waters;
- Forestry: Increasing the area of forests with appropriate water setbacks, seeking improvements to the licence applications process for key forestry activities, and rolling out schemes that promote water protection;
- Urban Wastewater: Continued investment in urban wastewater infrastructure and a review of water bodies where urban wastewater is a significant pressure; and
- Peatlands: Updating the National Peatlands Strategy and continuing the national programme of peatland restoration.

These measures are designed to ensure that all new developments comply with the WFD's fundamental requirements and contribute to the overall goal of achieving good water status by 2027.

This assessment considers and meets all the requirements and objectives outlined above, ensuring compliance with the WFD.

2.1.2 Other Relevant Policy and Guidance

The methodology adopted for this assessment takes cognisance of other relevant standards and regulations pertinent to undertaking a WFD assessment in particular the following:

- Council Directive 2006/118/EC, 2006. On the protection of groundwater against pollution and deterioration. European Parliament and the Council of European Communities;
- Commission Directive 2014/80/EU of 20 June 2014 amending Annex II to Directive 2006/118/EC of the European Parliament and of the Council on the protection of groundwater against pollution and deterioration;
- EU Water Framework Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy with amendments;
- European Communities (Water Policy) Regulations 2003 (S.I. No. 722/2003);
- Environmental Protection Agency, December 2011. Guidance on the Authorisation of Discharges to Groundwater.
- Department of the Environment, Heritage and Local Government, Environmental Protection Agency and Geological Survey of Ireland, 1999. Groundwater Protection Schemes (Groundwater Protection Schemes, 1999);

- Local Government, July 1990. No. 21 of 1990. Local Government (Water Pollution) (Amendment) Act, 1990;
- S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 and as amended;
- S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 and as amended.
- Environmental Protection Agency (EPA) (2022), Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EIAR);
- Inland Fisheries Ireland (IFI) (2016), Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Water.
- Transport Infrastructure Ireland (TII 2009) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes; and
- DoEHLG (Nov 2009) The Planning System and Flood Risk Management – Guidelines for Planning Authorities.

2.2 Waterbody Characterisation

The following definition of a waterbody is presented in Article 2 of the WFD:

“Body of surface water' means a discrete and significant element of surface water such as a lake, a reservoir, a stream, river or canal, part of a stream, river or canal, a transitional water or a stretch of coastal water. This definition is transcribed in Part 1 of S.1. No. 272/2009 - European Communities Environmental Objectives (Surface Waters') Regulations 2009. Guidance on what constitutes a "discrete and significant element" is presented in the "Common Implementation Strategy for the Water Framework Directive (2000/60/EC), Guidance document No. 2 identification of Water Bodies" (CIS No.2).

As noted in the CIS guidance document, "The Directive does not include a threshold for very small waterbodies". The WFD under Annex II sets out two systems for differentiating water bodies into typologies: System A and B System. The limited number of descriptors in System A was to aid cross comparison of waterbody typologies across the EU. However, in many regions of Europe the limited descriptors and parameters do not provide appropriate differentiation for Waterbodies. This was the case on the island of Ireland (ecoregion 17), where System B was adopted instead. System B has no predefined descriptor ranges but must allow for at least the same level of differentiation as System A and can consider additional descriptors to those required for System A.

As part of the implementation of the WFD in Ireland the EPA set out parameters for characterisation under System B. The EPA characterisation of waterbodies is described in the *Submission in accordance with Article 5 of Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, and in accordance with EC-DG Environment D.2* document 'Reporting Sheets for 2005 Reporting" dated 19th November 2004. (EPA, 2005).

It should be noted that WFD covers all waterbodies, but not every watercourse is monitored or classified by the EPA individually. Local 'non-characterised' water features are considered tributaries of the 'characterised' water bodies they connect to and are assessed as such here.

2.3 Water Framework Directive Classification

The information used in the classification of the status of our water bodies is collected in the national WFD monitoring programme.

2.3.1 Surface Water Assessment

Under the WFD, surface water bodies are defined as stated in Section 2.1 above and below:

- Rivers.
- Lakes.
- Transitional waters, such as estuaries, connect fresh waterbodies (i.e., rivers) and coastal waters (i.e., sea).
- Coastal waters.
- Artificial surface waterbodies; and,
- Heavily modified surface waterbodies.

The overall status of surface waters is classified using information on the ecological status and chemical status which are outlined below.

2.3.1.1 Ecological Status

The ecological status of a surface water body is assessed based on the following categories, with each category receiving a rating of, “High,” “Good,” “Moderate,” “Poor” and “Bad” (EPA, 2025). Refer to Figure 2-1 for a representation of the WFD classification of the waterbodies (Catchments.ie, 2025).

High status, which is considered to be the best status achievable or benchmark for a given water body, is the *‘reference condition’* defined as the biological, chemical, and morphological conditions associated with no or very low human pressure.

The ecological status of a surface water body is assessed according to:

- Biological quality (i.e., the condition of biological elements (aquatic flora and fauna));
- Physico-chemical quality (temperature, oxygenation, nutrient conditions); and
- Hydromorphological quality (waterflow (i.e., flow and tidal conditions), sediment composition and movement, riverbank structure, etc).

The overall ecological status of a surface water body is based on the lowest of the three individual categories, which means that the condition of a single quality element (i.e., biological, physico-chemical and hydromorphological) can cause a water body to fail to reach its WFD classification objectives.

In the case of artificial and heavily modified waters, ecological potential status is assessed similarly to ecological status above but is rated as “Maximum,” “Good,” “Moderate,” “Poor” or “Bad” ecological potential instead. In general terms, ‘maximum ecological potential’ means that the water body is as close as possible to a comparable surface water body, with the only differences being those directly attributed to artificial or modified nature of the water body.

2.3.1.2 Chemical Status

Chemical status (level of harmful chemicals in the water) is recorded by one of two ratings, ‘Good’ or ‘Fail.’ It is assessed by compliance with Environmental Quality Standards (EQS) for chemicals that are listed in the European Communities Environmental Objectives (Surface Waters) Regulations 2009 S.I. No. 272/2009 (as amended). This involves making sure that no changes take place that would worsen the current condition of any water body and that a Proposed Development does not prevent the achievement of the future status objectives of any waterbody.

The chemical status classification for the waterbody is determined by the lowest scoring chemical reported in the waterbody.

For an artificial or heavily modified waterbody hydromorphologically, which has been altered for anthropogenic purposes (i.e., water supply, flood protection or navigation), the objective is to achieve Good Ecological Potential (GEP) for those waterbodies. This means that the ecology must be as close as possible to that of a similar natural water body, without compromising the specified human use for which the waterbody is designated.

2.3.1.3 Groundwater Assessment

Groundwater is awarded either “Good” or “Poor” status. Groundwater is assessed based on its chemical and quantitative status.

2.3.1.4 Chemical Status

Good chemical status of a groundwater body requires the entry of hazardous substances and saline intrusion into the groundwater to be prevented, and the presence of other pollutants to be below the limits within S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 (as amended). Concentrations of pollutants must also not be of such a concentration as to affect the ecological or chemical status of associated surface waters or to damage linked terrestrial ecosystems.

2.3.1.5 Quantitative Status

Quantitative status (i.e., the amount of water present) is assessed based on whether or not the available groundwater resource is being reduced by the long-term rate of annual abstraction.

Refer to Figure 2-1 for a representation of the WFD classification of the waterbodies.

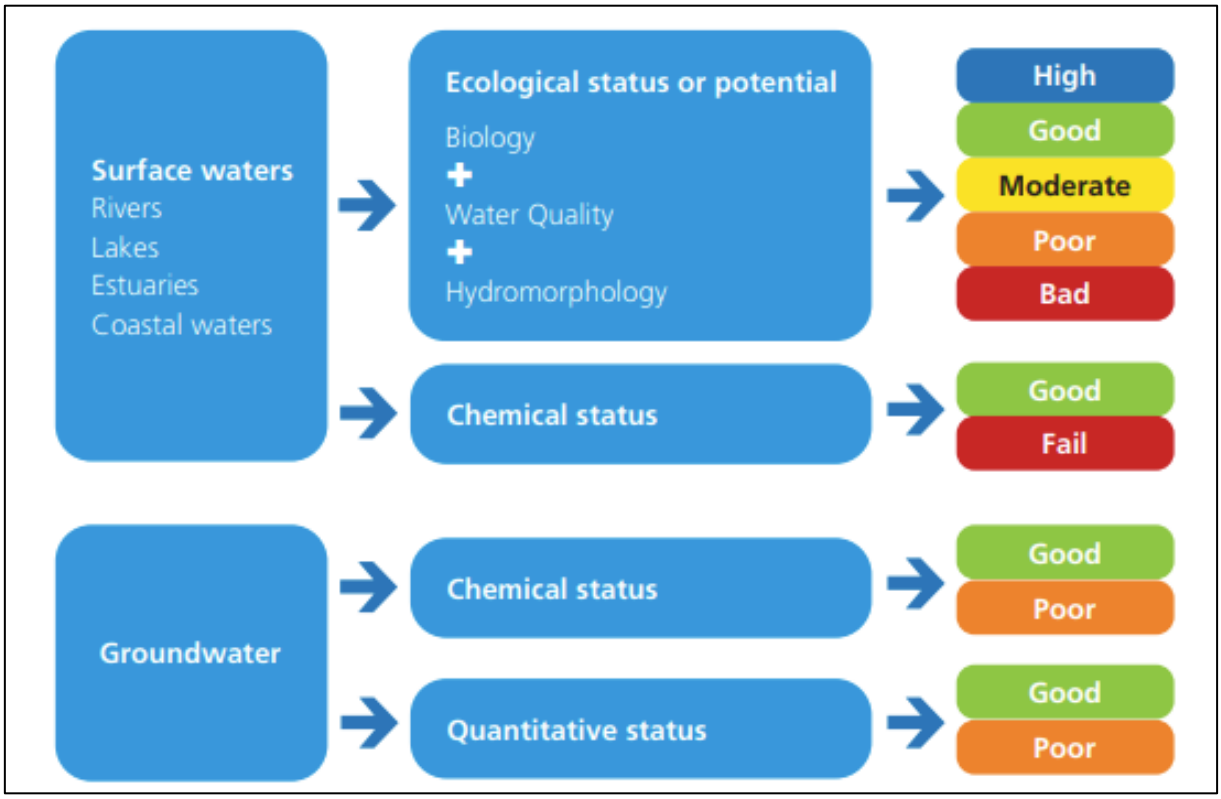

Figure 2-1. WFD Classification

2.4 Approach to WFD Assessment

In order to assist in the implementation of the WFD, EU member states, alongside Norway and the European Commission, developed a Common Implementation Strategy (CIS) in May 2001. This CIS was designed to provide coherent and comprehensible guidelines aimed at achieving the aims of WFD.

CIS Guidance Document 36 provides an outline of an approach to WFD Assessments which breaks the assessment down into the following sequential steps.

- Screening for Potential Effects - Determine whether the Proposed Development could have any direct or indirect effect on the different quality elements relevant to the WFD.
- Scoping of Further Investigations - Outline the information required to determine the significance of any effect on the relevant quality elements.
- Data Collection and Assessment - Assess whether any effect could cause deterioration or compromise the status/potential status of a water body.

If the Proposed Development is determined to compromise or deteriorate the status/potential status of a waterbody then an “Article 4(7) Test” is required. The Proposed Development can only be authorised if the conditions as outlined under Article 4(7) a) to d) are fulfilled. The applicant must provide detailed evidence to meet these four stringent tests:

- (a): All practical steps are taken to mitigate the adverse impacts on the water body.
- (b): The reasons for modifications or alterations are documented in the RBMP.
- (c)(1): There is an overriding public interest in the Development or

- (c)(2): The benefits outweigh those of the WFD objectives, particularly regarding human health, safety, or sustainable development.
- (d): The project's benefits cannot be achieved by a significantly better environmental option that is technically feasible and not disproportionately costly.

The Proposed Development must not permanently exclude or compromise the WFD objectives in other water bodies within the same RBD and must comply with other environmental legislation (Article 4(8)). Additionally, new provisions must guarantee at least the same level of protection as existing legislation (Article 4(9)). Additional guidance relating to Article 4(7) derogations is provided in the Common Implementation Strategy Document No.36 (EU Water Directors, 2017).

If the conditions are not fulfilled the Proposed Development cannot be authorised according to the WFD. If no impacts are identified, then no Article 4(7) assessment is required, and authorisation may be permitted according to the WFD.

3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

Durkan Carrickmines Developments Limited intend to apply for permission for a Large-Scale Residential Development at a site in the townland of Glenamuck North, Kilternan, Dublin 18. The site is generally bounded by the Glenamuck District Distributor Road to the south, which is recently constructed (to be known as the Kilternan Road); agricultural land to the west; De La Salle Palmerstown Football Club and the future Jamestown Park to the north; and Bective Rangers Football Club to the east.

Road works are proposed to the approved Glenamuck District Roads Scheme (ACP Ref. HA06D.303945) to provide access to the development from the Kilternan Road, which will include any necessary tie-ins to the existing footpath and cycle track.

The Proposed Development will principally consist of the construction of:

- a creche (c. 571 sq m); and,
- 219 No. residential units comprising:
    - 69 No. houses (51 No. 3-bed units and 18 No. 4-bed units).
    - 108 No. apartments (38 No. 1-bed units, 31 No. 2-bed units and 39 No. 3-bed units).
    - 42 No. duplexes (11 No. 1-bed units, 9 No. 2-bed units, and 22 No. 3-bed units).

The Proposed Development will range in height from 2 No. to 4 No. storeys.

The development also provides:

- car, bicycle and motorcycle parking;
- bin storage; ancillary storage;
- private balconies, terraces and gardens;
- hard and soft landscaping; boundary treatments;
- lighting; substations; and,
- all other associated site works above and below ground.

3.1 Construction Phase

The construction phase of the Proposed Development will include:

- Foundation design will be determined at detailed design stage, but will likely consist of shallow strip foundations that will bear on stone columns or piles.
- Excavation of soil and subsoil for the construction of building foundations, drainage and other infrastructure. It is anticipated that there will be no requirement for the excavation of bedrock during the construction phase of the Proposed Development.
- Where possible, it is intended to reuse suitable excavated soil and subsoil for landscaping and engineering use. However, where required, surplus materials will require removal offsite in accordance with all statutory legislation.
- The importation of aggregate fill materials will be required for the construction of the proposed development (e.g., hardcore/stone fill beneath road pavement, under floor slabs and for drainage and utility bedding / surrounds etc.).
- Temporary stockpiling of excavated material pending reuse onsite or removal offsite may be required.

- There may be a requirement for management of surface water (rainwater) and shallow groundwater, where encountered during groundworks.
- Construction of new foul and mains water connections in accordance with UE Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03), UE's Code of Practice for Water Infrastructure (IW-CDS-5020-03).
- Construction of new surface water drainage designed in accordance with the principles and objectives of Sustainable Drainage Systems (SuDS), the Greater Dublin Strategic Drainage Study (GDSDS) and the requirements of DLRCC.

3.2 Operational Phase

3.2.1 Surface Water Drainage

As documented in the Engineering Infrastructure Report (RMA, 2025a), there is no known surface water drainage provision at the Proposed Development site. The recently constructed distributor road (Glenamuck District Roads Scheme (GDRS)) project has locally diverted the route of the existing Glenamuck stream via a box culvert (WX01) passing beneath the road and reconnecting with the existing stream path. In addition, the GDRS has constructed a second culvert (namely Bective Rangers or WX02) at the downstream end of the Proposed Development (RMA, 2025a).

The total drained area of the site will be 5.2 hectares (ha), and the total drained surface water area in three (3 No.) separate catchments is approximately 4.44ha (RMA, 2025a), which will have two (2 No.) surface water outfall points.

- Catchment B1 - Comprises a catchment drained area of 3.51ha located downstream of the full SuDS treatment train, which will outfall the attenuated flow into the Glenamuck Stream at the headwall/culvert WX02.
- Catchment B2 – Comprises a catchment drained area of 0.66ha and outflows into the Glenamuck Stream at the same location as Catchment B1.
- Catchment B3 - Comprises a catchment drained area of 0.3ha and outflows into the Glenamuck Stream on the opposite side of the Glenamuck Stream at WX02.

As documented in the Engineering Infrastructure Report (RMA, 2025a), it is proposed as part of this application to construct a new road which will cross over the Glenamuck stream and connect the creche on the southern side of the Glenamuck stream with the main northern part of the site. Additionally, a new culvert is proposed in this location similar to the recently installed WX01 and WX02, as part of the DLRCC GDRS project.

The surface water drainage infrastructure for the Proposed Development will collect the rainfall and will treat, attenuate, store and convey the stormwater runoff through a series of SuDS features. Downstream of the SuDS elements, the retained stormwater flows will be stored in three (3 No.) below ground storage areas, such as the void arched attenuation systems vortex flow restricting devices (i.e., Hydrobrake or similar) (RMA, 2025a).

In accordance with the DLRCC Stormwater Management Policy, the HR Wallingford UK SuDS Greenfield Runoff Rate Estimation Tool was used to determine the Qbar value for the site. A calculated value of 30.1l/s was estimated for catchments B1 and B2 combined, which will have the outfall rate divided as 20.1 l/s and 10 l/s to suit the surface water design and available attenuation space, and a calculated value of 2.2l/s for Catchment B3. The proposed surface water discharge rates were derived using the drained site area (i.e., 4.44ha) as opposed to the overall application redline boundary (i.e., 5.2ha) (RMA, 2025a).

In accordance with the DLRCC Stormwater management Policy, an allowance for an increased rainfall due to climate change of 20% was applied to the drainage design model for multiple storm events and return periods (Q) of 2, 30 and

100 years. For the Q30 +20% increase in flows, the calculated maximum storage required is approximately 539m^3 for the three (3 No.) catchments and for the Q100 +20% the calculated maximum storage required is approximately 740m^3 for three (3 No.) catchments and for the 10% urban creep the calculated maximum storage required is approximately 74m^3 . The total storage provided for the Proposed Development is 839m^3 (RMA, 2025a).

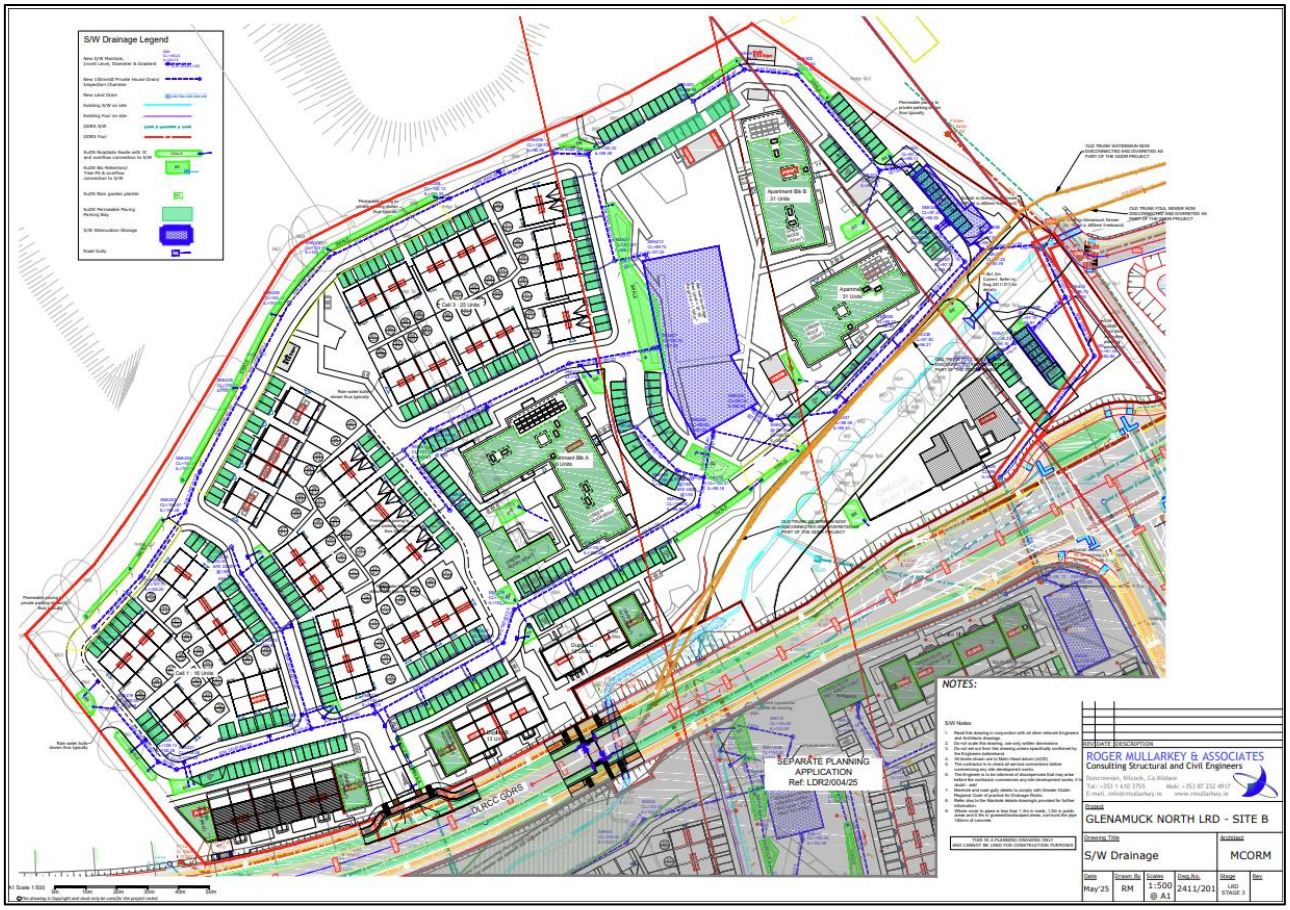

Figure 3-1. Proposed SuDS and Surface Water Drainage Layout

Surface water runoff from the Proposed Development will be managed in a surface water drainage system designed in accordance with the principles and objectives of:

- Sustainable Drainage Systems (SuDS);
- Dun Laoghaire Rathdown County Council's Drainage Department;
- DLRCC Development Plan 2022-2028; and
- Greater Dublin Sustainable Drainage Scheme (GDSDS).

The Greater Dublin Sustainable Drainage Scheme (GDSDS) provides a well-established, comprehensive framework of best practice principles and standards for SuDS that are widely recognised across Ireland. It is used as a benchmark for sustainable drainage design due to its robustness and recognition, supporting the delivery of a surface water system that aligns with both local and national objectives. The GDSDS addresses the issue of sustainability by requiring designs to comply with a set of drainage criteria that aim to minimise the impact of urbanisation by replicating the runoff characteristics of greenfield sites.

The topography of the site supports a natural variation in the catchment with lands to the north of the Glenamuck stream (approximately 93% of the site) sloping in a southerly direction down towards the Glenamuck stream and the lands to the south of the Glenamuck stream (approximately 7% of the site) sloping in a northerly direction downwards to the stream.

A SuDS treatment approach has been implemented in accordance with the CIRIA SuDS Manual C753 (2015), as required by the GDSDS, to provide amenity/biodiversity by replicating the natural characteristics of the site (i.e., discharge greenfield rate, topography, etc.). The SuDS treatment train approach, which takes account of quantity, quality and amenity issues to manage surface water runoff, is summarised as follows:

- Bio-Retention areas
- Filter Drains to rear of housing
- Swales adjacent to roads where practically feasible
- Tree pits where practically feasible
- Green Roofs
- Permeable paving to all parking spaces
- Silt-trap/catchpit manholes
- Hydrobrake limiting flow to the drained area Qbar greenfield rate
- Stone lined voided arch retention storage devices

As documented in the Engineering Infrastructure Report (RMA, 2025a), with the inclusion of these measures, it is proposed that the SuDS treatment of the runoff has been adequately addressed.

In accordance with the GDSDS (RMA, 2025a), the four (4 No.) principal design criteria are as follows;

- Criterion 1 – River water quality protection
- Criterion 2 – River regime protection
- Criterion 3 – Level of service (flooding) for the site
- Criterion 4 – River Flood protection

Criterion 1 - complied with by the inclusion of interception of at least 5mm of rainfall to prevent runoff to the receiving water. Interception will be achieved within the substrate of the green roofs, in the voids of the stone base of the permeable paving, in the voids of the stone base of the filter drains, in the stone below the permeable paving, in the tree pits, swales, bio-retention areas and in the stone base of the attenuation storage.

Criterion 2 – complied with in applying the total allowable Qbar outfall rate of 32.3l/s and providing more than the required volume of attenuation storage in the void arched systems.

Criterion 3 – complied with by the following sub-criterion:

- No flooding on site for the Q30 except where specifically planned.
- No internal property flooding for site critical duration storm event.
- No internal property flooding satisfied as 500mm freeboard to house FFL’s is achieved.
- No flooding of adjacent areas unless specific routing planned for the Q100 + 20% climate change.

Criterion 4 – River flood protection is satisfied with the application of Qbar (32.3 l/s) and therefore long-term storage is not required (RMA, 2025a).

The layout of the proposed surface water drainage network is presented in Roger Mullarkey & Associates - Drawing No. 2411/201 submitted with the planning application under separate cover and in Figure 3-1.

3.2.2 Foul Drainage

As documented in the Engineering Infrastructure Report (RMA, 2025a), there is an existing 225mm diameter foul sewer spur provided by the GDRS project located in the southeast corner of the site and it is proposed to outfall the foul drainage at that point. An existing 375/400mm diameter public trunk foul sewer is located within the site boundary area on the north side of the Glenamuck Stream, flowing from west to east, which has already been intercepted and diverted into the new GDRS boundary as part of DLRCC roads project and is no longer a working sewer. However, as the GDRS project will be completed in approximately Q1 of 2026, the foul trunk diversion and spur connection are to be live and available for connection. Connection with these provided spurs is dependant on a successful outcome of this LRD planning application.

The foul drains/sewers will be in accordance with the Uisce Éireann (UE) Code of Practice for Wastewater Infrastructure 2020.

According to the Engineering Infrastructure Report (RMA, 2025a), the minimum public sewer diameter is to be 225mm and the private foul water drainage is to be in accordance with the UE Code of Practice for wastewater Infrastructure 2020, which requires individual house connections to be connected to the main public foul sewer using a 100mm diameter drain with a minimum gradient of 1/60 in any one drainage connection. In addition, the proposed foul sewer crosses beneath the Glenamuck stream, falling by gravity from north to south (RMA, 2025a).

A Pre-Connection Enquiry Form application (PCEA) in relation to the Proposed Development was submitted to Uisce Éireann (UE). A Confirmation of Feasibility (CoF) was issued by UE (UE COF Reference: CDS24006778) on the 19th of November 2025. The UE COF confirmed the foul connection to be “feasible without infrastructure upgrade” by UÉ:

- *‘A new 225mm diameter spur has been constructed from the new 450mm diameter foul sewer to service the development as part of the Glenamuck District Roads Scheme.’*

The layout of the proposed foul water drainage network is presented in Figure 3-2 and Roger Mullarkey & Associates - Drawing No. 2411/202 submitted with the planning application under separate cover.

Foul water from the Proposed Development will be treated in the Shanganagh-Bray Wastewater Treatment Plant (Discharge Licence No. D0038-02) before ultimately discharging to the Southwestern Irish Sea - Killiney Bay (HA10) coastal waterbody (ID: IE_EA_100_0000).

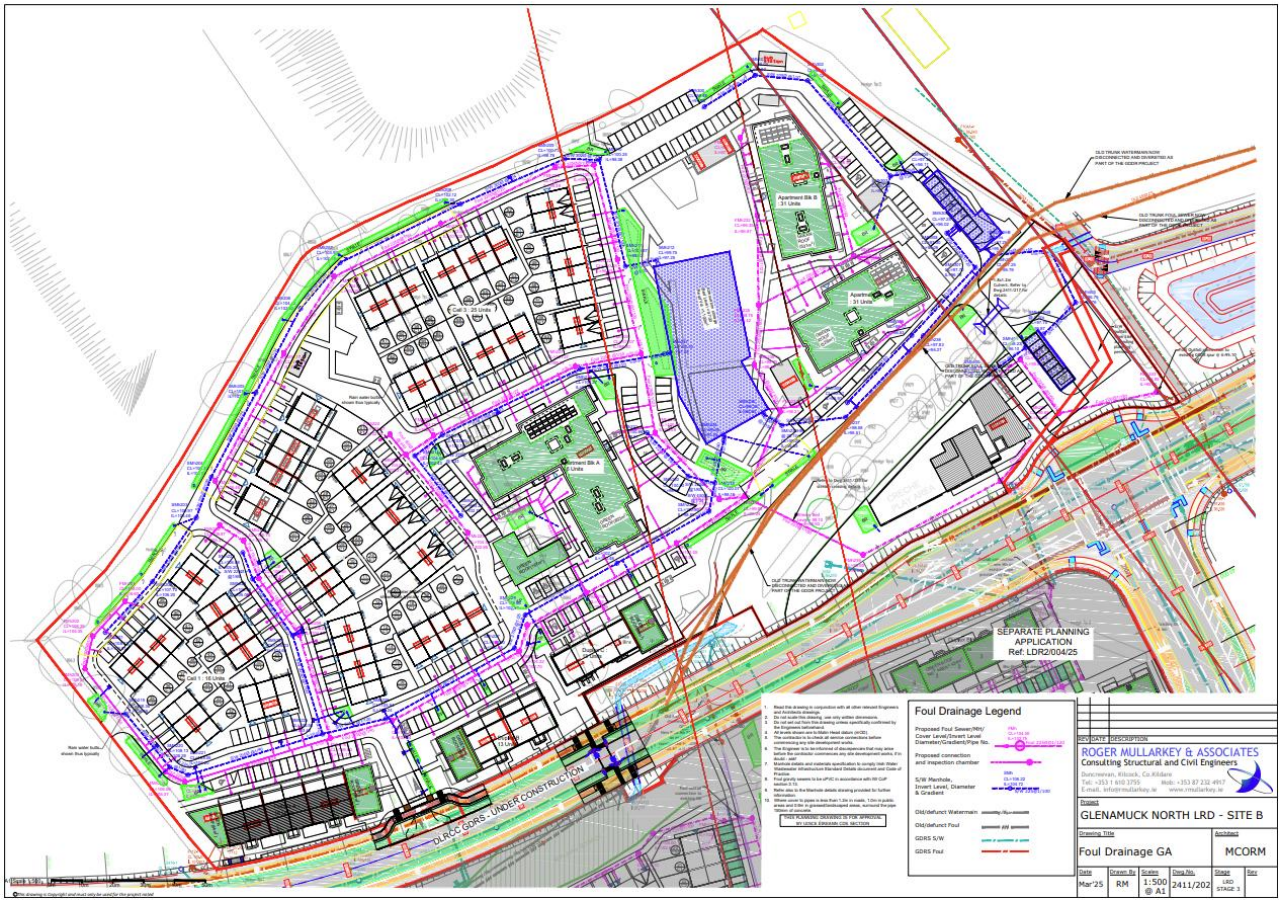

Figure 3-2. Proposed Foul Layout

3.2.3 Water Supply

As documented in the Engineering Infrastructure Report (RMA, 2025a), there is an existing 300mm diameter public watermain located within the site boundary area along the north side of the Glenamuck stream. This watermain has already been intercepted and diverted into the new GDRS boundary as part of DLRCC roads project

Water connection to the public infrastructure will be via a new 200mm diameter spur from the new diverted watermain back into the site laid as part of the GDRS project, subject to a successful planning outcome to this LRD application and completion of a connection agreement with UE (RMA, 2025a).

A PCEA in relation to the Proposed Development was submitted to UE. A CoF was issued by UE (UE COF Reference: CDS24006778) on the 19th of November 2025. The UÉ COF confirmed the foul connection to be "feasible without infrastructure upgrade" by UE:

- *'A new 200mm diameter spur has been constructed from the new 355mm diameter water main to service the development as part of the Glenamuck District Roads Scheme.'*

All watermain layout and details are to be in accordance with the UE Code of Practice for Water Infrastructure 2020 and the Water Infrastructure Standard details 2020.

The layout of the proposed water supply is presented in Figure 3-3 (source, Roger Mullarkey & Associates - Drawing No. 2411/203) submitted with the planning application under separate cover.

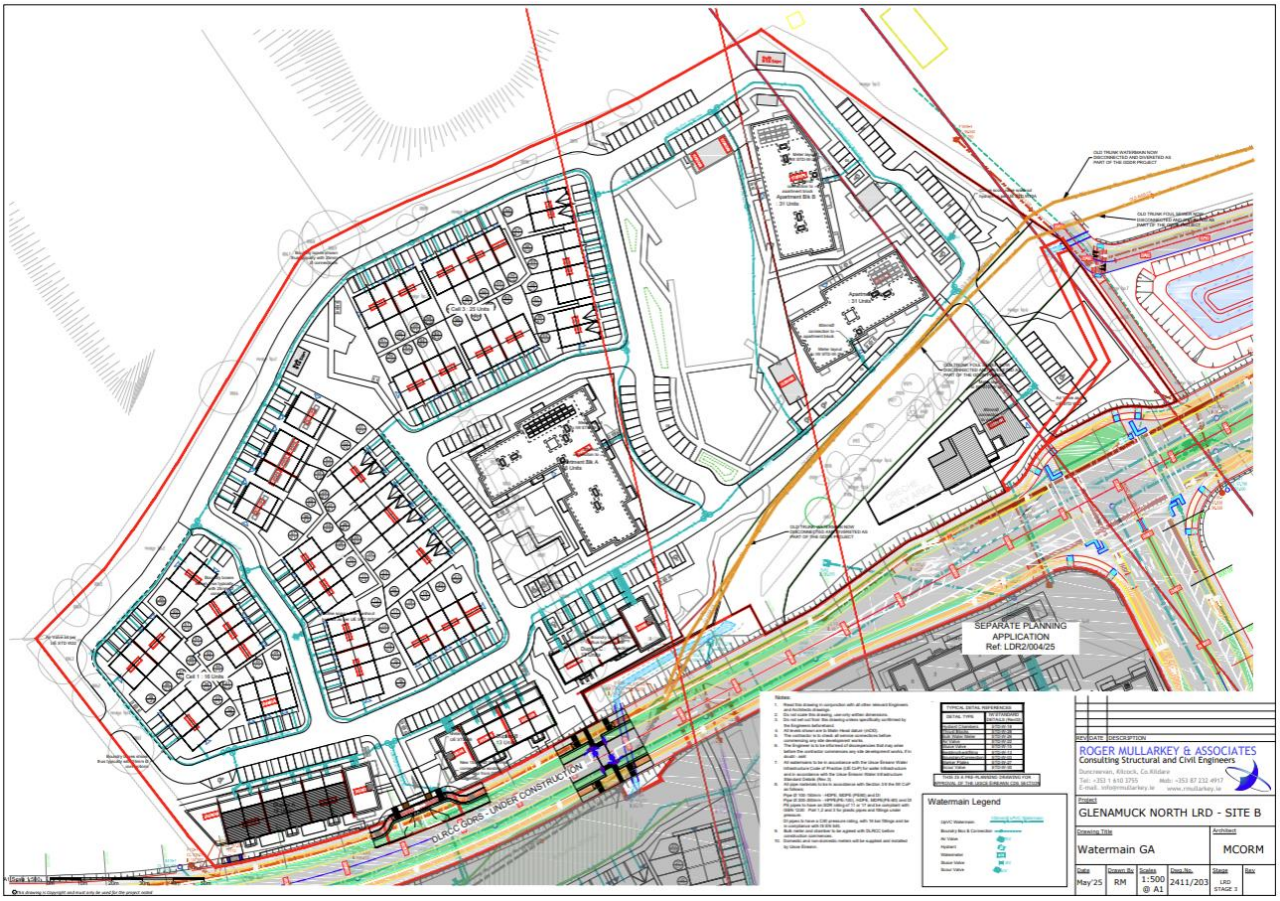

Figure 3-3. Proposed Watermain Layout

4 STUDY AREA SCREENING

The WFD screening assessment was based on the information presented on the EPA mapping website (EPA, 2026) and the specific quality status of the nearby waterbodies (i.e., groundwater, surface water, transitional waterbodies, etc.) was gathered from the information presented on the catchments.ie website.

The study area is defined to ensure a comprehensive assessment of existing conditions on waterbodies in the vicinity of the Proposed Development. This area extends beyond the immediate boundaries of the site of the Proposed Development to include a broader region. The site refers specifically to the area where the Proposed Development will take place. In contrast, the study area encompasses a wider region, extending at least 2.0 km from the site, as recommended by the Institute of Geologists of Ireland (IGI) 2013 Guidelines. This broader area is necessary to identify and evaluate all potential receptors that could be affected by the Proposed Development, either directly or indirectly. The distinction between the application site and the study area is crucial. The site of the Proposed Development is the focal point of the Proposed Development, while the study area includes additional regions that might experience secondary effects.

4.1 Surface Water

The Proposed Development site lies within the Ovoca-Vantry WFD Catchment (Hydrometric Area 10), Dargle WFD Sub-catchment (WFD name: Dargle_SC_010 ID: 10_5) (EPA, 2025) and the Carrickmines Stream_010 WFD River Sub Basin (IE_ EA_10C040350).

Two surface water features are recorded on the EPA database (EPA, 2026) within and adjacent to the site. The first being the Glenamuck_North (also named Glenamuck Stream) (WFD name: Carrickmines Stream_010; River Waterbody Code: IE_EA_10C040350). This stream, which is a tributary of the Carrickmines Stream, traverses the southeastern portion of the site and flows in a northeasterly direction before discharging into the Carrickmines Stream (WFD name: Carrickmines Stream_010; River Waterbody Code: IE_EA_10C040350), located approximately 1.60km northeast of the site. The second watercourse on site is the Jamestown_10 stream (WFD name: Carrickmines Stream_010; River Waterbody Code: IE_EA_10C040350) runs along the northern boundary of the site and flows in an easterly direction before converging into the Glenamuck Stream approximately 0.6km to the northeast of the site.

The Carrickmines stream flows east for approximately 2.1km, before turning southeast for a further 1.61km, where it discharges into the Shanganagh River (WFD name: Shanganagh_010; River Waterbody code: IE_EA_10S010600). The Shanganagh continues east for approximately 1.76km, ultimately discharging into the Southwesten Irish Sea-Killiney Bay Coastal Waterbody (Hydrometric Area: 10; Coastal Waterbody code: IE_EA_100_0000), located approximately 6.5km east of the site.

Other surface water features mapped by the EPA (EPA, 2026) within the 2km radius of the site are as follows:

- The Carrickmines_Great (WFD name: Carrickmines Stream_010; River Waterbody Code: IE_EA_10C040350), a tributary of the Glenamuck North, is located approximately 0.68km to the northeast of the site at its closest point.
- The Barnacullia River (WFD name: Carrickmines Stream_010; River Waterbody Code: IE_EA_10C040350) and its tributaries are located approximately 0.42 km to the north of the site at its closest point. The Barnacullia River flows in an easterly direction before discharging into the Carrickmines Stream approximately 1.25km northeast of the site at its closest point.

- The Laughanstown stream (WFD name: Carrickmines Stream_010; River Waterbody Code: IE_EA_10C040350), a tributary of the Carrickmines Stream, which is located approximately 1.6km to the northeast of the site, flows in a northerly direction before discharging into the Carrickmines Stream.
- The Shanganagh River (WFD name: Shanganagh_010; River Waterbody code: IE_EA_10S010600) is located approximately 1.3km to the south of the site. The river runs in an easterly direction before discharging into the Southwestern Irish Sea-Killiney Bay, approximately 6.5km east of the site at its closest point. There are a number of tributaries discharging into the Shanganagh River, as follows:
    - The Ballycorous Stream (WFD name: Shanganagh_010; River Waterbody code: IE_EA_10S010600) is located 1.9km to the southeast of the site at its closest point.
    - Kingston 10 River (WFD name: Shanganagh_010; River Waterbody code: IE_EA_10S010600) is located 1.8km to the southeast of the site at its closest point.
    - The Glenamuck_South (WFD name: Shanganagh_010; River Waterbody code: IE_EA_10S010600) is located 1.3km to the south of the site at its closest point.

The surface water features mapped by the EPA (EPA, 2026) within a 2km radius of the site are presented in Figure 4-1.

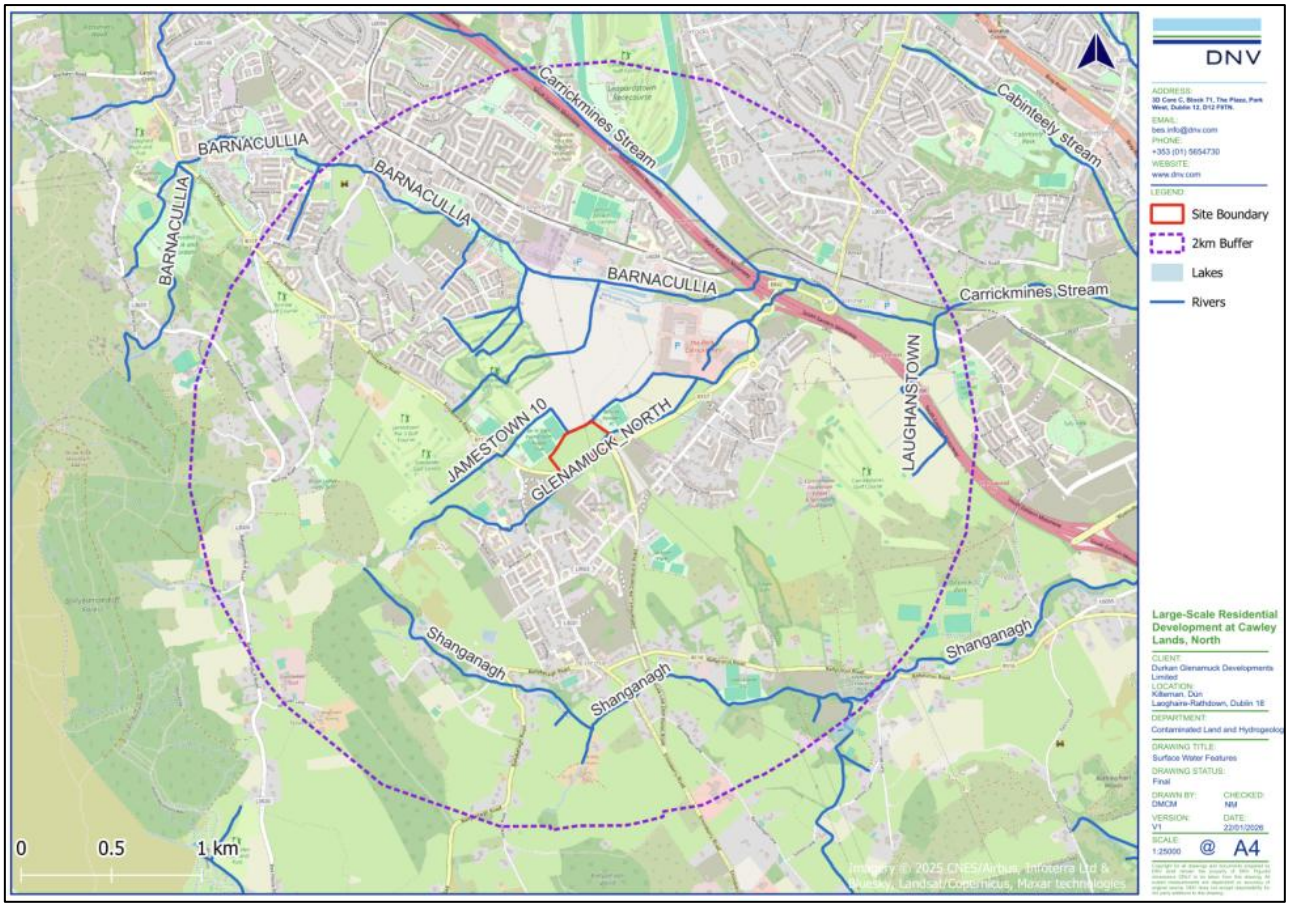

Figure 4-1. Surface Water Features within 2km of the Proposed Development

Table 4-1: Surface Waterbodies Potentially Hydraulically Connected to the Site

Name (WFD)	EPA Code	Waterbody Type	WFD Status (2019 – 2024)[1]			WFD Risk Status
			Ecological	Chemical	Hydro-morphological	
Carrickmines_Stream_010	IE_EA_10C040350	River	Good (Note - High Confidence)[2]	-	-	Not at Risk
Shanganagh_010	IE_EA_10S010600	River	Good (Note - Low Confidence)	Good	-	Not at Risk
Southwestern Irish Sea - Killiney Bay (HA10)	IE_EA_100_0000	Coastal Waterbody	Good (Note – High Confidence)[2]	High	Good	Not at Risk

Notes:

1. The 4th cycle monitoring (2019–2024) has been published in Q4-2024 by the EPA, with results that form the basis of the next River Basin Management Plan (RBMP) 2027–2033.

2. The protection and restoration of these high-status water bodies is a priority under Ireland's RBMP.

4.2 Groundwater

The bedrock aquifer within the Wicklow Groundwater body (GWB) (EU Code: IE_EA_G_076) beneath the site is classified by the GSI (GSI, 2026) as a Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones.

The Wicklow GWB covers approximately 1,396 km^2 and spans a large area within Co. Wicklow and a smaller area of Co. Dublin (GSI, 2026). The topography is mountainous, comprising the Wicklow and Dublin Mountains. Elevations range from sea level along the coast to high elevations along the western boundary between the Eastern and Southeastern RBDs with the highest peak of 840 meters above Ordnance Datum (mOD) at Mullaghcleevaun (GSI, 2026).

The main recharge process will be diffuse recharge from water percolating through the overlying tills and into the aquifer. The main groundwater discharge mechanism within the Wicklow GWB is directly to the Irish Sea along the coast (GSI, 2025). The GWB will also discharge to the over lying streams and rivers as baseflow. The proportion of river flow that is baseflow will vary throughout the area (GSI, 2026).

Figure 4-2 shows the groundwater bodies within 2km of the site and the quality status (i.e., chemical and quantitative) and identification of the groundwater bodies within the study area are presented in Table 4-2.

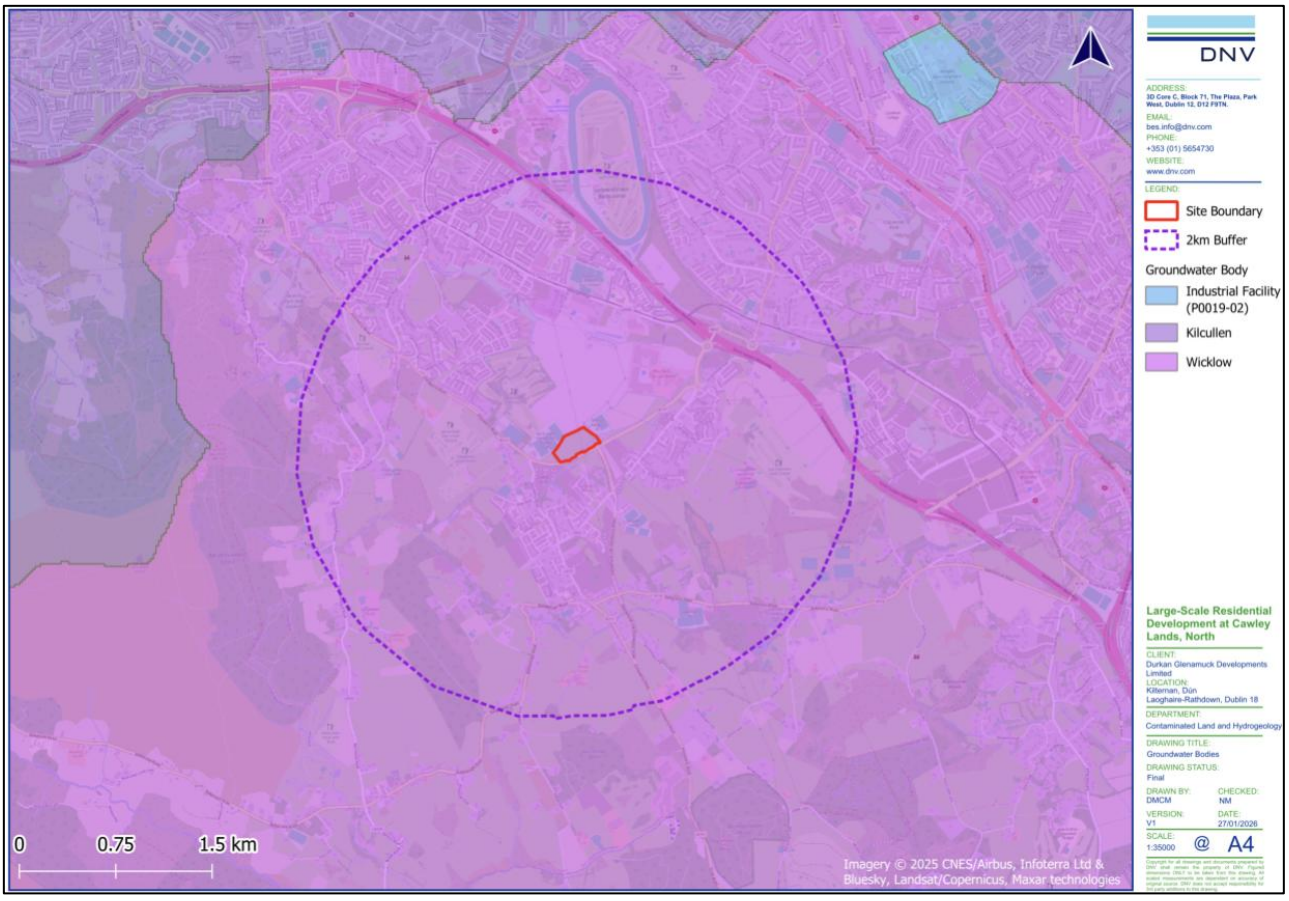

Figure 4-2: Groundwater Bodies within 2km of the Proposed Development

Table 4-2: Groundwater Waterbodies Risk and Status within 2km of the Site

Name	EPA Code	Type	Status (2019 – 2024)[1]		WFD Risk Status
			Chemical	Quantitative	
Wicklow	IE_EA_G_076	Poorly productive bedrock	Good	Good	At Risk

Notes:

1. The 4th cycle monitoring (2019–2024) has been published in Q4-2024 by the EPA, with results that form the basis of the next River Basin Management Plan (RBMP) 2027–2033.

Although the Proposed Development does not include groundwater abstraction, the vulnerability of the groundwater will temporarily increase due to the excavation of soils and subsoils during the construction phase. As such, mitigation measures will be required during site activities to limit potential releases to groundwater during the construction phase of the Proposed Development (refer to Section 5.2 for the GWBs screening assessment).

4.3 Flood Risk Assessment

A Site Specific Flood Risk Assessment (SSFRA), in accordance with the requirements set out in the DoEHLG and OPW published guidelines The Planning System and Flood Risk Management 2009 (the Guidelines) and the Strategic Flood Risk Assessment Policy of Appendix 15 of the Dun Laoghaire Rathdown County Development Plan 2022 – 2028, was prepared for the site and Proposed Development by Roger Mullarkey & Associates (RMA, 2025b). The report assessed the potential flood risk associated with fluvial, groundwater, coastal and pluvial flooding.

Tidal Flood Risk:

As documented in the SSFRA report (RMA, 2025b), the Proposed Development is not located within or in the vicinity of the coast (i.e., >5km) and given the elevated nature of the site (i.e., c.103mOD Malin Head) indicates that no risk of tidal flooding has been considered for the site (RMA, 2025b).

Fluvial Flood Risk:

As documented in the SSFRA report (RMA, 2025b), the DLRCC CDP "Strategic Flood Risk Assessment" (Appendix 15) has created Flood Zone maps for the DLRCC area, which indicate a minor area along the stream banks within the southeastern portion of the Proposed Development is liable to flood in the 1 in 100 year event (Flood Zone A) from the Glenamuck Stream.

An SSFRA was carried out by DBFL Consulting Engineers on behalf of DLRCC, as part of the recently constructed GDRS project, which determined existing potential flood risk areas due to existing undersized culverts within the stream, and proposed mitigation of the flood risk by inclusion of correctly sized culverts where the GDRS traverses the Glenamuck Stream (RMA, 2025b). The GDRS project has included two (2 No.) new drainage culverts (WX01 and WX02) at the Proposed Development. The WX01 culvert has diverted the Glenamuck Stream under the GDRS project. Both drainage culverts (WX01 and WX02) have reduced modelled Q100 flood levels in the vicinity of the works. The GDRS SSFRA concluded that *"the proposed roads are within Flood Zone C and are at low risk of fluvial flooding"* (RMA, 2025b).

Pluvial Flood Risk:

As documented in section 3.2.1, there are no known surface water drainage pipes within the Proposed Development. There is an existing 375/450mm diameter foul sewer main crossing the site parallel to the northern side of the Glenamuck stream. However, this sewer has already been diverted into the GDDR as part of the GDRS roads project and is no longer a live sewer. There is also an existing 300mm pipe watermain parallel to the existing foul sewer. However, this main has also been diverted into the GDDR and is no longer a live main.

A detailed pluvial flood risk assessment has been reviewed, which concluded that '*the requirements have been met and no further assessment is required regarding pluvial flood risk*' (RMA, 2025b).

Groundwater Flood Risk:

As documented in the SSFRA report (RMA, 2025b), the site is not suitable for soakaway design due to the sandy gravelly CLAY soils/subsoils conditions, the groundwater was encountered approximately between 1 to 1.5mbgl and the fact that there were no recorded groundwater issues for the Proposed Development on the Geological Survey of Ireland (GSI) online mapping, which suggest that the Proposed Development is not at risk of flooding from groundwater. Therefore, a detailed assessment was not required as there is a low risk of groundwater flooding onto the site (RMA, 2025b).

SSFRA Conclusions:

The report (RMA, 2025b) concludes the following:

- *"In accordance with the above noted Guidelines, as sequential staged approach was adopted in assessing the flood risk for the subject development.*
- *It was determined in accordance with the Guidelines that the lands on which the subject development is located is within a flood Zone C as defined in the Guidelines.*
- *Based on the information available it is concluded that this site is suitable for development and has an overall low risk of being affected by flooding."*

4.4 Register for Protected Areas

The WFD Register of Protected Areas is a comprehensive list of areas designated under the Water Framework Directive (WFD) that require special protection due to their environmental significance. These areas include:

I. Drinking Water Protected Areas: Areas designated for the abstraction of water intended for human consumption.

II. Areas for the Protection of Economically Significant Aquatic Species: Such as shellfish waters.

III. Recreational Waters: Including bathing waters.

IV. Nutrient-Sensitive Areas: Such as nitrate vulnerable zones.

V. Areas for the Protection of Habitats and Species: Including those designated under the Habitats Directive and Birds Directive.

The register helps ensure that these areas are managed and their integrity protected to meet the Article No.4 objectives set out in the WFD.

4.4.1 Nature Conservation

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (2009/147/EC) seeks to protect birds of special importance

by the designation of Special Protection Areas (SPAs). SACs and SPAs are collectively known as Natura 2000 or European sites (referred to hereafter as Natura 2000 site).

National Heritage Areas (NHAs) are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with SAC and/or SPA sites. Although many NHA designations are not yet fully in force under this legislation (referred to as 'proposed NHAs' or pNHAs), they are offered protection in the meantime under planning policy which normally requires that planning authorities give recognition to their ecological value.

There are three (3 No.) Natura 2000 sites that are identified with a potential hydrological connection to the site and Proposed Development. The Natura 2000 sites and other protected and designated sites or areas with a potential hydraulic connection to the site are summarised below and presented in Figure 4-3.

- Rockabill and Dalkey Island SAC (Site Code: 003000) – approximately 7.8 km to the east of the site.
- Bray Head SAC (site Code: 000714) – approximately 8.7km southeast of the site.
- Dalkey Islands SPA (Site code:004172) - approximately 9.1 km to the northeast of the site.

There are three (3No.) proposed NHA identified with a potential hydraulic connection to the Proposed Development:

- Dalkey Coastal Zone and Killiney Hill (Site Code: 001206) – approximately 5.1km to the east of the site.
- Loughlinstown Woods pNHA (Site Code: 001211) – approximately 3.7km to the east of the site.
- Bray Head pNHA (site Code: 000714) – approximately 8.7km southeast of the site.

A potential hydraulic connection to Bray Head SAC (Site Code: 000714) and Bray Head pNHA (Site Code: 000714) via the Irish Sea has been established. However, the SAC and pNHA are located approximately 5.9km south along the coast from the point of discharge at the Shanganagh River. Considering the separation distance and the anticipated assimilation capacity of the receiving waters, no significant adverse effects are expected.

Further details and assessment of the potential impacts of the Proposed Development on habitats, flora and fauna are included in the AA Screening Report (DNV, 2026a) and Ecological Impact Assessment (DNV, 2026b), both submitted with the planning application for the Proposed Development under separate cover.

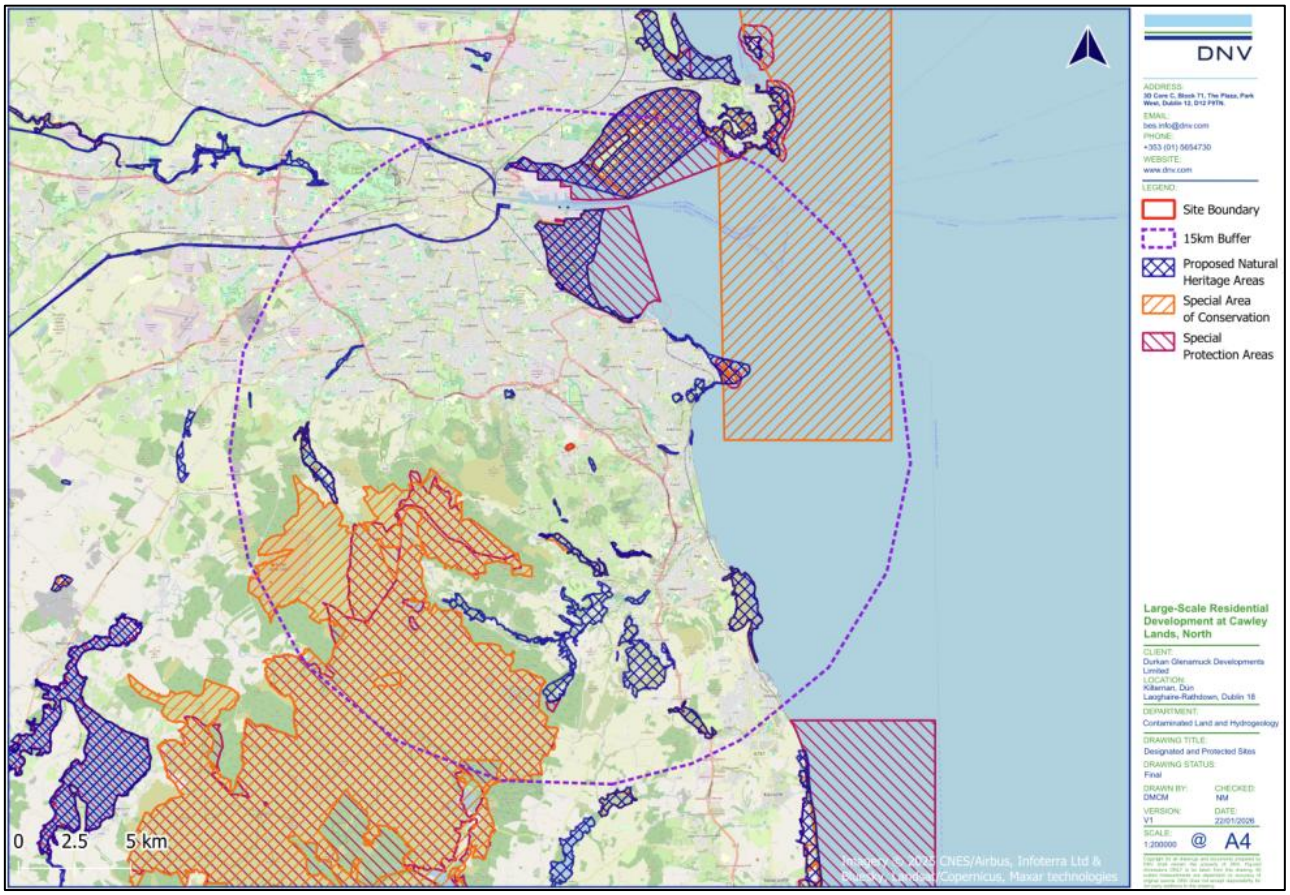

Figure 4-3. Designated and Protected Sites

4.4.2 Additional Protected Areas

The WFD brings together the processes and aims of a range of other European Directives, such as the Revised Bathing Water Directive (2006/7/EC), the Shellfish Directive (2006/113/EC) and the Conservation of Natural Habitats and of Wild Fauna and Flora Directive (92/43/EEC). These Directives establish protected areas to manage water, nutrients, chemicals, economically significant species, and wildlife, and have been brought in line with the planning timescales of the WFD.

4.4.2.1 Drinking Water

The river drinking water protected areas (DWPA) are represented by the full extent of the Water Framework Directive (WFD) river waterbodies from which there is a known qualifying abstraction of water for human consumption as defined under Article 7 of the WFD.

The Shanganagh River, located approximately 1.3 km south of the site, is identified by the EPA (2026) as a surface water drinking water source under Article 7 of the WFD. The site is hydrologically connected to the Shanganagh River, via the Carrickmines Stream, which receives flow from the Jamestown_10 and Glenamuck Stream transversing the site, which discharges into the Shanganagh River approximately 4.8 km downstream of the site, as discussed in Section 4.1. The groundwater body underlying the site, the Wicklow GWB (IE_EA_G_076), is classified under Article 7 Abstraction for Drinking Water.

There are no other surface water drinking sources recorded within a 2km radius of the site.

4.4.2.2 Shellfish Areas

Although the Shellfish Waters Directive (SWD) has been repealed, areas used for the production of shellfish that were designated under the SWD, are protected under the WFD as 'areas designated for the protection of economically significant aquatic species.'

The requirement from a WFD perspective is to ensure that water quality does not impact on the quality of shellfish produced for human consumption. In Ireland, 64 areas have been designated as shellfish waters (S.I. No. 268 of 2006, S.I. No. 55 of 2009, S.I. 464 of 2009).

The closest designated Shellfish Area location is Malahide (IE_EA_020_0000), located approximately 20.5km northeast of the site.

4.4.2.3 Nutrient Sensitive Areas

EU member states are required under the Urban Wastewater Treatment Directive (91/271/EEC) to identify nutrient-sensitive areas. These have been defined as "natural freshwater lakes, other freshwater bodies, estuaries and coastal waters which are found to be eutrophic or which in the near future may become eutrophic if protective action is not taken".

The closest designated nutrient-sensitive area (estuaries and lakes) is the Liffey Estuary (IE_EA_090_0300-Urban Wastewater Treatment Directive Sensitive Area) located approximately 10.48 km north of the site at its closest point. In addition, the closest nutrient-sensitive area (rivers) is the Liffey (IERI_EA_2010_0007-Urban Wastewater Treatment Directive Sensitive Area) located approximately 13.6km northwest of the site at its closest point.

4.4.2.4 Bathing Waters

Bathing waters are designated under Regulation 5 of Directive 2006/7/EC. Designated Bathing Waters exist under S.I. No. 79/2008 and S.I. No. 351/2011 Bathing Water Quality (Amendment) Regulations 2011. EC Bathing Water Profiles - Best Practice and Guidance 2009.

The closest designated Bathing Water location is Killiney Beach (IEEABWC100_0000_0400), located approximately 5.4km northeast of the site.

5 STAGE 1 – SCREENING FOR POTENTIAL EFFECTS

This stage aims to determine if the Proposed Development has the potential to impact WFD waterbodies. It involves gathering relevant design information of the Proposed Development and the baseline environment of potentially impacted waterbodies. Where no potential for impacts to receiving waterbodies are identified, Stage 2 and 3 of the assessment are not undertaken.

The screening stage includes the following:

- Initial screening to identify relevant water bodies using criteria such as direct impact, connectivity, and underlying groundwater bodies;
- Reviewing the RBMP to decide which water bodies to include; and
- Collecting baseline data and relevant design information of the Proposed Development.

The screening assesses the potential risk to WFD objectives based on design, implementation, and baseline data. Activities associated with the Proposed Development are divided into construction and operational phases, as detailed in Section 3. The assessment uses expert knowledge for a qualitative evaluation of potential risks to WFD objectives.

5.1 Surface Waterbodies

The methodology for screening surface waterbodies is based on proximity to the proposed works and scale and nature of the works likely to affect the waterbody in question. The initial study area extends beyond the site boundaries and includes a 2.0km radius of the site (i.e., Proposed Development) and potential receptors outside of this radius that are potentially hydrologically connected with the site which is based on the Institute of Geologists of Ireland (IGI) Guidelines (IGI, 2013). This broader study area is necessary to identify and evaluate all potential receptors that could be affected by the Proposed Development, either directly or indirectly. The distinction between the site and the study area is crucial. The site of the Proposed Development is the focal point of the Proposed Development, while the study area includes any potential hydrogeological / hydrological connections to sensitive receptors including habitats that might experience secondary effects.

The WFD status for river, lake, transitional and/or coastal water bodies that have a potential hydrological connection to the site as recorded by the EPA (EPA, 2025) in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003) are provided in Table 5-1 which also presents the screening exercise undertaken for identified surface waterbodies within the study area (refer to Figure 5-1) .

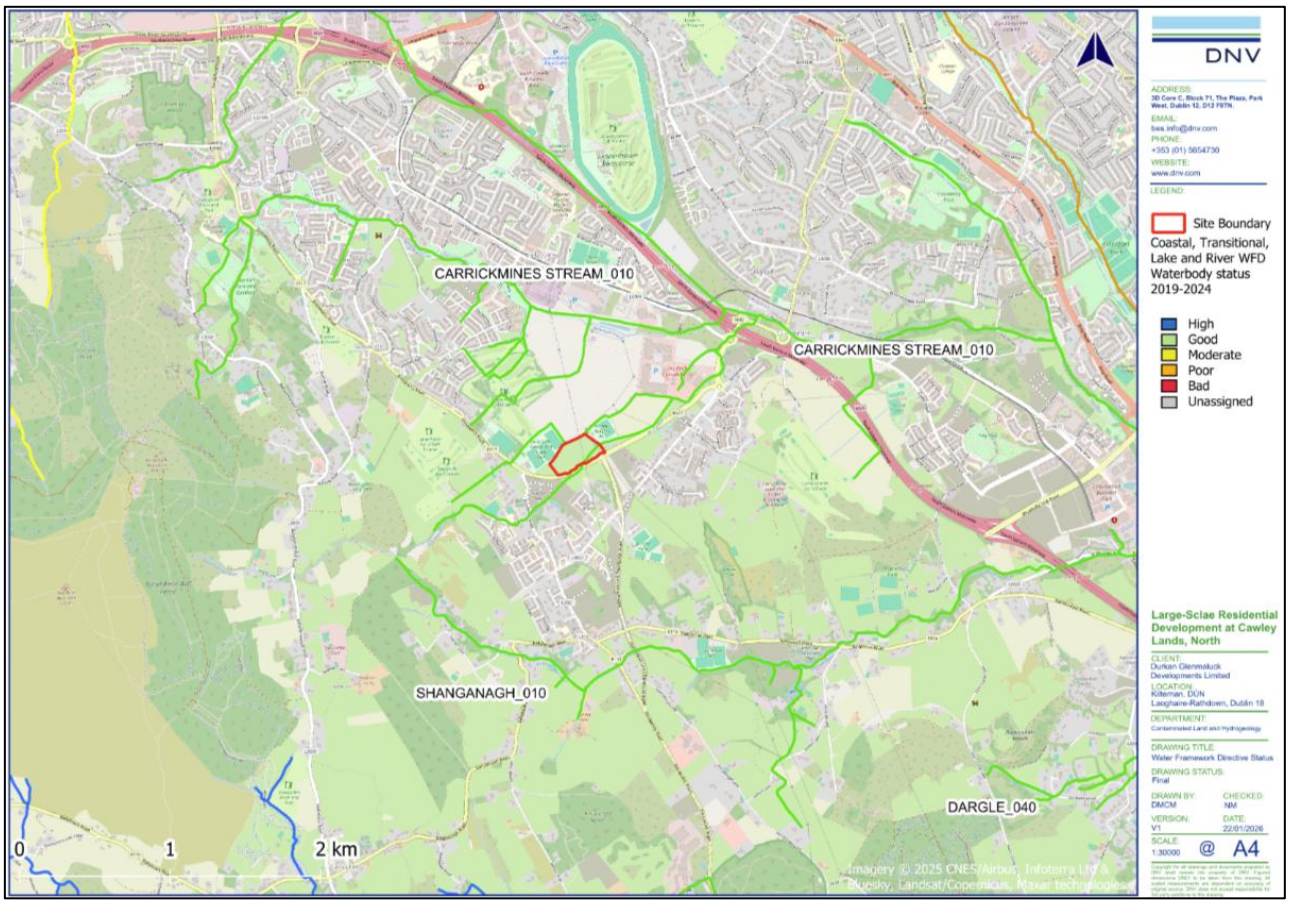

Figure 5-1. Water Framework Directive – Surface Waterbodies

Table 5-1. Surface Waterbodies Screening Assessment

Waterbody Name (WFD Name)	Waterbody EU Code	Screening Assessment	Justification
Carrickmines_Stream_010	IE_EA_10C040350	Screened In	This waterbody drains the main development area of the site and includes the Glenamuck stream (Glenamuck_North), the Jamestown_010 and Carrickmines Stream, which will be the receiving watercourse for runoff from the site. It is noted that this waterbody comprises another headwater stream rising in the uplands to the north, the Barnacullia Stream. However, the distance involved and the fact that the watercourse is upgradient of the site, mean that any impact is unlikely.
Shanganagh_010	IE_EA_10S010600	Screened In	This waterbody is located downstream of the Proposed Development, which has been screened in as it is hydraulically connected to the site via the Glenamuck stream (Glenamuck_North) and Jamestown_010 and ultimately via the Shanganagh-Bray WWTP discharge.
Southwestern Irish Sea - Killiney Bay (HA10) Coastal Waterbody	IE_EA_100_0000	Screened In	Waterbody downstream of the Proposed Development, which has been screened in based on its hydraulic connection with the Carrickmines Stream_010 and the Shanganagh-Bray WWTP.

5.2 Groundwater

Similar to surface waterbodies (refer to Section 5.1), the methodology for screening groundwater bodies is based on proximity to the site of the Proposed Development and the scale and nature of the works likely to effect the applicable waterbody or waterbodies.

The WFD status and risk for groundwater bodies that have a potential hydrological connection to the site, as recorded by the EPA (EPA, 2025), in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003), are provided in Table 5-2 and Figure 4-2.

Groundwater bodies within a 2km radius of the site and the Proposed Development were screened in for assessment. As a result, the Wicklow GWB underlying the site has been included in the assessment. No other groundwater bodies within this radius or hydraulically connected to the site have been identified as likely to have their status impacted by the Proposed Development.

Table 5-2. Groundwater Bodies Screening Assessment

Waterbody Name	Waterbody EU Code	Screening Assessment	Justification
Wicklow GWB	IE_EA_G_076	Screened In	There is a potential pathway (i.e., direct hydrogeological link) for potential contamination to enter the Wicklow GWB beneath the site, during the construction phase of the Proposed Development, via groundwater flow, which could potentially degrade the water quality further of the 'at risk' GWB (Wicklow GWB) if unmitigated. Construction works will temporarily increase groundwater vulnerability and exposure during the excavation of soils and subsoils. According to the site investigations undertaken for the site (GII, 2025), the lithology encountered was sandy, gravelly, CLAY with low cobble and boulder content. Further, soakaway testing determined that the water level dropped very slowly and therefore the locations were not recommended as suitable for soakaway design and construction. However, during the excavation of the two (2 No.) trial pits, groundwater was encountered at 1.0 at trial pit SA01 and no groundwater was encountered at trial pit SA02 according to the exploratory logs. Therefore, it is envisaged that shallow groundwater may be encountered during the excavations required to achieve the formation levels for the site, including building foundations, roads and all other associated infrastructure. Therefore, this groundwater body has been screened in for potential impacts on the Wicklow GWB.

5.3 Register of Protected Areas

The WFD Register of Protected Areas is a comprehensive list of areas designated under the Water Framework Directive (WFD) that require special protection due to their environmental significance. These areas include:

- Drinking Water Protected Areas: Areas designated for the abstraction of water intended for human consumption;
- Areas for the Protection of Economically Significant Aquatic Species: Such as shellfish waters;
- Recreational Waters: Including bathing waters;
- Nutrient-Sensitive Areas: Such as nitrate vulnerable zones; and
- Areas for the Protection of Habitats and Species: Including those designated under the Habitats Directive and Birds Directive.

The register helps ensure that these areas are managed and their integrity protected to meet the Article No.4 objectives set out in the WFD.

The WFD and its associated directives provide a robust framework for the protection of water bodies, including protected areas. Guidance documents, such as the CIS guidance (European Commission, 2021, Common Implementation Strategy) on the delineation of water bodies and groundwater monitoring, clarify the requirements for protected areas and their integration into the overall water management strategy.

Given this integrated approach, a separate screening / risk evaluation for protected areas is not required. The existing assessment process already encompasses the necessary considerations and measures to protect these areas. The assessment ensures compliance with the WFD objectives including protected areas.

Although the Proposed Development does not directly interact with any designated protected areas, the potential for indirect effects via surface water or groundwater pathways cannot be ruled out at this stage (refer to section 5.5). Therefore, the screening process has taken into account the potential for the Proposed Development to influence the status or objectives of these protected areas. This includes consideration of the relevant River Basin Management Plans (RBMPs), the Water Action Plan 2024, and the associated Programme of Measures (PoM), to ensure that the development does not conflict with national water protection objectives.

5.4 Water Action Plan (WAP) 2024 Programme of Measures

The Water Action Plan (WAP) provides information on the status and planned actions for surface waterbodies in Ireland. These entries offer insights into the specific measures being considered or implemented to improve the ecological status of the surface waterbodies.

The WAP identifies several key pressures impacting water quality in surface waterbodies across the country:

- Nutrient Pollution: Excessive levels of phosphorus and nitrogen from agricultural runoff are a significant concern. These nutrients can lead to eutrophication, which depletes oxygen in the water and harms aquatic life.
- Urban Pollution: Inadequately treated wastewater and stormwater runoff from urban areas contribute to the degradation of water quality. This includes pollutants such as heavy metals, oils, and other contaminants.

- Physical Modifications: Changes to the river's natural flow and structure, such as barriers and drainage works, disrupt the ecosystem and affect water quality; and
- Climate Change: Altered weather patterns and increased frequency of extreme weather events exacerbate existing pressures on water quality.

The WAP identifies several suggested actions to protect and restore water quality in surface waterbodies, ensuring a sustainable and healthy aquatic environment. The actions include:

- Nutrient Management: Implementing stricter controls on agricultural practices to reduce nutrient runoff. This includes promoting the use of buffer strips, cover crops, and precision farming techniques.
- Improving Wastewater Treatment: Upgrading wastewater treatment facilities to ensure that effluents meet higher standards before being discharged into waterbodies.
- Restoring Natural Ecosystems: Removing or modifying barriers to restore natural river flow and habitat connectivity. This also involves re-naturalising riverbanks and floodplains.
- Integrated Catchment Management: Developing and implementing catchment-specific management plans that address local pressures and involve stakeholders in decision-making processes; and
- Climate Adaptation Measures: Enhancing resilience to climate change by incorporating adaptive management strategies and investing in green infrastructure.

As part of the screening process, the WAP 2024 has been reviewed to identify any relevant pressures or planned measures that may intersect with the Proposed Development. The WAP outlines key pressures on water quality in Ireland, including nutrient pollution from agriculture, urban wastewater discharges, physical modifications to watercourses, and the effects of climate change. These pressures are particularly relevant given the rural and hydrologically setting of the Proposed Development.

The screening has also considered the WAP's proposed actions, such as improved nutrient management, restoration of natural hydromorphology, and enhanced wastewater treatment, all of which aim to support the achievement of WFD objectives. The presence of these pressures and the alignment of the Proposed Development with the WAP's objectives are important considerations in determining whether the Proposed Development could contribute to cumulative impacts or conflict with existing Programme of Measures (PoM).

5.5 Drinking Water Protected Areas and Natura 2000 Sites

In addition to the direct potential impacts of the Proposed Development, the presence of protected areas—including Drinking Water Protected Areas and Natura 2000 sites—within the wider hydrological catchment necessitates consideration of indirect effects. While these sites may not be located immediately adjacent to the development footprint, potential hydrological connectivity through surface or groundwater pathways could result in downstream impacts. As part of the screening process, the Water Action Plan 2024 and the relevant River Basin Management Plans (RBMPs) have been reviewed to ensure that the Proposed Development does not conflict with national water quality objectives or compromise the implementation of any Programme of Measures (PoM) established to protect or improve water body status.

6 STAGE 2 – SCOPING FURTHER INVESTIGATIONS

The publicly available data reviewed in this assessment has been deemed adequate for appraising the potential risks associated with the proposed development in relation to WFD article 4 objectives. The use of desk-based information is appropriate for this assessment due to the comprehensive nature of existing baseline data recorded as part of the EPA's ongoing WFD monitoring programme with supplemental data provided by organisations such as the GSI, NPWS and OPW. This provides sufficient insight into hydrological and hydrogeological conditions without necessitating further investigations.

7 STAGE 3 – WFD ASSESSMENT

Potential effects of the Proposed Development on the WFD surface waterbody status (i.e., river waterbodies, transitional waterbodies, etc.), both during construction and operation, have been considered. Refer to Section 1.1, Section 7.1, Section 7.2 and Section 7.3 for further assessment.

7.1 Surface Waterbodies

7.1.1 Carrickmines_Stream_010

Table 7-1. Carrickmines_Stream_010 Waterbody

Receptor	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
Hydromorphological quality	Yes	No	During the construction phase, there will be no direct discharges to or abstractions from surface water or groundwater at the Proposed Development. Excavations required for building foundations and near-stream works at the Carrickmines_Stream_010 (i.e., the Glenamuck Stream and Jamestown_10), have the potential to mobilise sediment entrained in runoff and adversely affect the sediment regime and hydromorphological quality of receiving waterbodies. Sediment deposition raises the riverbed, reducing channel depth and flood capacity. This can lead to altered flow paths and increased bank erosion. Where dewatering of shallow groundwater is required or where surface water runoff must be pumped from the excavations, any alteration to flows within the waterbody will likely be imperceptible. Nonetheless, water will be managed in accordance with best practice standards (i.e., CIRIA C750), the CEMP and regulatory consents to minimise the potential impact on the local surface waterbodies. During the operational phase, the increase in impermeable surfaces in the site and associated effects on runoff will be managed with the incorporation of standard drainage measures included in the proposed design (i.e., SuDS). Therefore, there is no potential for adverse effects to the hydromorphological status of this waterbody during the operational phase.	Mitigation measures required.

Receptor	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
Biological quality	Yes	No	Earthworks needed for building foundations and near-stream works pose a risk to aquatic habitats. These works may release suspended solids into the water column. Elevated turbidity can reduce light penetration, smother benthic habitats, and impair macroinvertebrate communities, key indicators of ecological status under the WFD. If sedimentation occurs during sensitive periods (e.g. spawning or larval development), it may also affect fish populations. In the absence of mitigation, these impacts could result in deterioration in biological status, primarily in the Carrickmines_Stream_010 waterbody. Furthermore, the use of deleterious materials such as fuels, oils and cementitious materials will be required to be used onsite through the construction phase and so, any fugitive emission has the potential to adversely affect the biological quality of this waterbody (i.e., the Carrickmines_Stream_010). There will be no deleterious material storage on site during the operation phase, which combined with standard drainage measures included in the design (i.e. SuDS) means that there is no potential for adverse effects to the biological status of this waterbody during the operational phase.	Mitigation measures required.
Physico-Chemical quality	Yes	No	Excavations of soils and subsoils and stockpiling required during the construction phase have the potential to mobilise suspended solids directly into the Glenamuck stream and Jamestown_10 via overland flow, which could adversely affect water quality. In addition, suspended solids entrained in surface runoff from haul routes to and from the site may further impact chemical quality. The use of deleterious materials such as fuels, oils, and cementitious products throughout construction introduces a risk of contamination if not properly managed.	Mitigation measures required.

Receptor	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
			Where dewatering of shallow groundwater is required or where surface water runoff must be pumped from the excavations, any alteration to the physico-chemical composition of the waterbody will likely be imperceptible. Nonetheless, water will be managed in accordance with best practice standards (i.e., CIRIA C750), the CEMP and regulatory consents to minimise the potential impact on the local surface waterbodies. There will be no deleterious material storage on site during operation, which combined with standard drainage measures included in the design (i.e. SuDS) means that there is no potential for adverse effects to the chemical status of this waterbody during the operational phase.	

7.1.2 Shanganagh_010

Table 7-2. Shanganagh_010 Waterbody

Receptor	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
Hydromorphological quality	Yes	No	Works required in the upstream catchment to facilitate the construction of the Proposed Development have the potential to mobilise sediment and adversely affect the hydromorphological quality of downstream receiving waterbodies in an unmitigated scenario. The incorporation of standard drainage measures included in the proposed design (i.e. SuDS), means that there is no potential for adverse effects to the hydromorphological status of this waterbody during the operational phase.	Mitigation measures required.
Biological quality	Yes	No	Works required in the upstream catchment to facilitate the construction of the Proposed Development have the potential to mobilise sediment and adversely affect the biological	

Receptor	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
			quality of receiving waterbodies in an unmitigated scenario. The use of deleterious materials such as fuels, oils and cementitious materials will be required to be used on site throughout the construction phase. There will be no deleterious material storage on site during operation, which combined with standard drainage measures included in the design (i.e. SuDS) means that there is no potential for adverse effects to the biological status of this waterbody during the operational phase.	Mitigation measures required.
Physico-Chemical quality	Yes	No	Works required in the upstream catchment for building foundations and near-stream works have the potential to mobilise sediment in significant volumes and adversely affect the chemical quality of receiving waterbodies. The use of deleterious materials such as fuels, oils and cementitious materials will be required to be used on site throughout the construction phase. There will be no deleterious material storage on site during operation, which combined with standard drainage measures included in the design (i.e. SuDS) means that there is no potential for adverse effects to the chemical status of this waterbody during the operational phase.	Mitigation measures required.

7.2 Coastal Waterbodies

7.2.1 Southwestern Irish Sea – Killiney Bay (HA 10) Coastal Waterbody

Table 7-3. Southwestern Irish Sea – Killiney Bay (HA 10) Coastal Waterbody Impact Assessment

Receptor	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
Hydromorphological quality	No	No	No works are proposed in or adjacent to the Southwestern Irish Sea - Killiney Bay (HA10) Coastal Waterbody. In addition, the separation distance from the site and the natural dilution capacity of this coastal waterbody mean that any potential effect on the Southwestern Irish Sea - Killiney Bay (HA10) coastal waterbody is very unlikely. Therefore, it is considered that there is no potential for the Proposed Development to adversely affect the hydromorphological status of this receiving coastal waterbody. Furthermore, the incorporation of standard drainage measures included in the proposed design (i.e. SuDS), ensures that there is no potential for adverse effects to the hydromorphological status of this waterbody during the operational phase of the Proposed Development.	None required.
Biological quality	No	No	Excavations of soils and subsoils and stockpiling during the construction phase have the potential to mobilise suspended solids into the Carrickmines Stream_010 (Glenamuck stream and Jamestown_10), Shanganagh_010 River and therefore, indirectly into the Southwestern Irish Sea - Killiney Bay (HA10) coastal waterbody. This could adversely affect the biological quality of the receiving waterbody. In addition, the use of deleterious materials such as fuels, oils, and cementitious products throughout construction introduces a risk that any fugitive emissions could impact this waterbody.	None required.

Receptor	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
			However, given the significant dilution capacity of the Southwestern Irish Sea - Killiney Bay (HA10) coastal waterbody, perceptible effects are considered very unlikely. Therefore, there is no potential for adverse impacts on the biological quality (i.e., habitats or species) of this coastal waterbody. Furthermore, there will be no deleterious material storage onsite during the operational phase of the Proposed Development, which combined with standard drainage measures included in the design (i.e., SuDS) will ensure that there is no potential for adverse effects to the biological status of this coastal waterbody.	
Physico-Chemical quality	No	No	Excavations of soils and subsoils and stockpiling during the construction phase have the potential to mobilise suspended solids indirectly into the Southwestern Irish Sea - Killiney Bay (HA10) coastal waterbody, which could affect its physico-chemical quality. The use of deleterious materials such as fuels, oils, and cementitious products during construction also introduces a risk of contamination if not properly managed. However, given the significant dilution capacity of this coastal waterbody, any effects are unlikely to have a perceptible or significant impact on its overall status. There will be no direct discharges from the Proposed Development to this waterbody, although an indirect connection exists via Carrickmines Stream_010 (Glenamuck stream and Jamestown_10), the Shanganagh_010 River and the Shanganagh-Bray WWTP. It is considered that any effects associated with normal operational discharges of foul water to Shanganagh-Bray WWTP from the Proposed Development will be insignificant due to the distances involved and the natural dilution within the coastal waterbody. Furthermore, any contribution to the Shanganagh-Bray WWTP will be agreed with Uisce Éireann and will comply with statutory consents.	None required.

Receptor	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
			Based on the separation distances and nature of the development, there is no potential for adverse effects on physico-chemical quality during either the construction or operational phases of the Proposed Development.	

7.3 Groundwater Bodies

7.3.1 Wicklow GWB

Table 7-4. Wicklow GWB Impact Assessment

Receptor	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
Chemical quality	Yes	No	There will be no direct discharge to groundwater during the construction phase of the Proposed Development. Surface runoff will be managed during construction and there will be no unauthorised discharges of water from the site. Construction activities will include the use of potentially hazardous materials, including cementitious materials, fuels and oils and other materials. A potential uncontrolled release of materials could result from the failure of secondary containment, or a materials handling accident could also result in a potential effect on the receiving environment (i.e., underlying Wicklow GWB) which has the potential to adversely affect the chemical quality of this already 'At Risk' receiving waterbody. These conditions could create a direct pathway to the aquifer. This risk will significantly reduce following completion of construction, when heavy machinery and hazardous material storage are no longer required. Standard mitigation measures during construction will reduce the risk to the groundwater body's chemical status to an acceptable level. Any dewatering required, including the pumping of groundwater, where encountered in excavations, could alter the local groundwater flow regime and contaminant distribution within the subsurface (i.e., groundwater quality beneath the site). Standard mitigation measures during the construction phase will reduce the risk posed to the groundwater body chemical status to an acceptable level. During the operational phase of the Proposed Development, there will be no storage of hazardous material onsite and surface water runoff from the Proposed Development will	Mitigation measures required.

Receptor	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
			be managed in accordance with SuDS and GDSDS. Therefore, it is considered that there will be no potential for adverse effects to chemical quality during the operational phase.	
Quantitative quality	Yes	No	There may be a requirement for management of surface water (rainwater) and shallow groundwater, where encountered during groundworks. During excavations, temporary dewatering may be required to facilitate construction. This could result in short-term localised lowering of groundwater levels and a temporary reduction in recharge potential. However, given the scale and duration of dewatering, and the classification of the underlying aquifer as a poorly productive bedrock aquifer, these effects are expected to be minor and reversible. Regardless, water will be managed in accordance with best practice standards (i.e., CIRIA C750), the CEMP and regulatory consents to minimise the potential impact on the underlying groundwater. During the operational phase, there will be no discharges to groundwater or abstraction of groundwater as part of the Proposed Development. While the change in land cover and increase in hardstanding could alter infiltration patterns, the incorporation of SuDS within the surface water drainage network will promote continued groundwater recharge. This is unlikely to adversely affect the quantitative status of the Wicklow GWB. Overall, it is considered that there will be little to no change in the recharge potential of the aquifer, and therefore, no adverse quantitative effects are predicted.	Mitigation measures required.

8 DESIGN AVOIDANCE AND MITIGATION

The measures outlined in this section of the report will ensure that there will be no potential for adverse effects on waterbody status. The effective implementation of these measures will ensure that the Proposed Development will not have any impact on compliance with the EU Water Framework Directive, European Communities (Environmental Objectives) Surface Water Regulations (S.I. 272 of 2009 and as amended) and the European Communities Environmental Objectives (Groundwater) Regulations (S.I. No. 9 of 2010 and as amended) individually or in combination.

8.1 Construction Phase

During the construction phase, all works will be undertaken in accordance with the Construction Environmental Management Plan (CEMP) (DNV, 2025c). Following appointment, the contractor will be required to further develop the CEMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground and surface water with regard to the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA-C532', CIRIA, 2001). The CEMP will be implemented for the duration of the Construction Phase, covering construction and waste management activities that will take place during the construction phase of the Proposed Development.

These measures will address the main activities of potential impact, which include:

- Control and management of surface water runoff;
- Control and management of water and management of dewatering activities;
- Control and handling of cementitious materials;
- Stockpiles / Sedimentation
- Appropriate fuel and chemical handling, transport and storage;
- In-stream works; and
- Welfare facilities.

A comprehensive list of full mitigation measures is detailed in the CEMP (DNV, 2025c) and more generally below.

8.1.1 Control of Fuel and Chemical Storage and Use

The storage and use of fuel and oils will be kept to a minimum at the site. The storage of fuels and refuelling of plant and machinery onsite will be undertaken at the site in strict accordance with procedures outlined below.

All construction-related fuel and oil will be strictly controlled in accordance with procedures outlined in the CEMP and will be stored on an impervious base within a bund remote from any surface water drains and water courses. All tank, container and drum storage areas will be rendered impervious to the materials stored therein and will be rooved to exclude rainwater. Bunds will be designed having regard to the EPA guidelines on the 'Storage and Transfer of Materials for Scheduled Activities' (EPA, 2013) and Enterprise Ireland Best Practice Guidelines (BPGCS005). All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:

- 110% of the capacity of the largest tank or drum within the bunded area; or
- 25% of the total volume of substance that could be stored within the bunded area

Any fuels retained on drip trays, mobile bunds, etc., will be emptied into a secure bunded waste oil drum to await appropriate disposal offsite in accordance with all relevant waste management legislation.

Refuelling of plant during the construction phase of the Proposed Development will be carried out in accordance with standard best practice. Onsite refuelling will only be carried out at the designated, impermeable refuelling station location onsite with appropriate containment in place. All fuel/oil deliveries to onsite oil storage tanks will be supervised, and records will be kept of delivery dates and volumes.

The refuelling station and designated areas for fuel, oil and chemical storage will be established according to best practice including the criteria below:

- Located at least 50m from a watercourse or drain which will be protected / temporary diversion put in place (i.e., sandbags) as required.
- Located on level ground.
- Located on an impermeable base (e.g., concrete slab or other areas of hardstanding).
- Located under cover to prevent damage from the elements.
- Located in secure areas.
- Located well away from moving plant, machinery and vehicles.

The refuelling station and designated areas for fuel, oil and chemical storage will be fully equipped for spill response. Spill kits and oil absorbent material will also be carried within mobile plant and located at vulnerable locations around the site. A specially trained and dedicated Environmental and Emergency Spill Response Team will be appointed before the commencement of works at the site.

Daily checks of machinery will be carried out to ensure it is in good working order. Any equipment not meeting the required standard will not be Proposed for use within the site. Where possible, any oil and lubricant changes and maintenance will take place offsite. Only emergency breakdown maintenance will be carried out onsite. Drip trays and spill kits will be available on site to ensure that any spills from vehicles are contained and removed offsite.

Where oils and chemicals are used and stored onsite, they will be sealed, secured and stored in a dedicated internally bunded chemical storage cabinet unit or inside concrete bunded areas to prevent any seepage to ground. There will be clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.

An up-to-date inventory of the type of product stored / used and the quantity available onsite will be established and maintained by the Main Contractor. The register will be available at all times and will include the following as a minimum:

- Valid Safety Data Sheets (SDS).
- Health and Safety (H&S) controls and procedures.
- Environmental controls to be implemented when storing, handling, using and in the event of spillage of materials.
- Emergency response procedures / precautions for each material.
- Details of Personal Protective Equipment (PPE) required when using the material.

Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the Proposed Development for disposal or recycling in accordance with all relevant waste management legislation.

Any spillage of fuels, lubricants, or hydraulic oils will be immediately contained in accordance with the procedures

outlined in the Environmental Emergency Preparedness and Response (refer to Section 7.3.1 of the CEMP (DNV, 2025c)), which will be developed by the Main Contractor prior to the commencement of the construction phase and will be implemented by the Environmental Manager / CMT.

All personnel working onsite will be trained in the handling of materials, the sensitive nature of the receiving environment, the drainage system, the consequences of accidental spillages and pollution incident control response. Emergency silt control and spillage response procedures contained within the CEMP will ensure that appropriate information will be available on site outlining the spillage response procedures and a contingency plan to contain silt during an incident.

Provided that these requirements are adhered to, and site crew are trained in the appropriate refueling techniques, it is not expected that there will be any fuel / oil wastage at the site.

8.1.2 Control and Management of Soil (including Contaminated) and Other Materials

The removal of all surplus and waste materials including soil will be managed in accordance with all appropriate statutory requirements.

Where required, site investigation including soil sampling and environmental risk assessment will be undertaken by the Project Environmental Consultant, in accordance with the EPA Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites (EPA, 2013) and British Standard Investigation of Potentially Contaminated Sites - Code of Practice (BS10175:2011+A2:2017), to determine the suitability of soils to be retained onsite for the Proposed development in terms of environmental (receiving water environment) and human health risk.

The Main Contractor (once appointed) will implement procurement procedures to ensure that aggregate, fill material, and topsoil (where required) are acquired from reputable sources with suitable environmental management systems, as well as regulatory and legal compliance. The Main Contractor will vet the source of aggregate, fill material, and topsoil imported to the site in order to ensure that it is of a reputable origin and that it is “clean” (i.e. it will not contaminate the environment).

Measures laid out in Section 8.1.1 will serve to prevent contamination of the soil from any potential fuel, oil and chemical spillages. However, in the unlikely event that soil becomes contaminated, for example, a fuel spill onsite or a burst / leaking hydraulic hose, the Main Contractor will ensure that the management of contaminated material is undertaken in accordance with best practice procedures outlined in Section 9 of the CEMP.

In the event that hazardous wastes, previously deposited wastes or previously unidentified contaminated soil are discovered onsite or in the unlikely event soil becomes contaminated (e.g., a fuel spill onsite or a burst / leaking hydraulic hose), the Main Contractor will ensure that the material will be segregated and stored appropriately for sampling, assessment and/or classification in accordance with the best practice procedures. A hazardous waste/soil management plan will be designed and implemented by the Project Environmental Consultant, detailing the estimated volumes, mitigation measures, destinations for the authorised disposal/ treatment and the designated authorised contractors for the movement of the material.

The removal of contaminated materials onsite, if encountered, will be undertaken in consultation with the Project Environmental Consultant.

8.1.2.1 Control of Stockpiles

The Main Contractor (once appointed) will ensure that the stockpiling of excavated materials, other C&D waste materials generated at the site or construction materials (e.g., imported aggregates, pipework etc.) will be kept to a minimum. However, in the event that the stockpiling of materials at the site is necessary (i.e., pending the results of environmental risk assessment or waste classification), the Main Contractor (once appointed) will ensure that stockpiles are managed as follows:

- A suitable temporary storage area will be identified and designated. A minimum set back of 20m from the Glenamuck_North Stream, which traverses the southeastern portion of the site and the Jamestown 10, which passes along the northern part of the site, will be maintained.
- All stockpiles will be assigned a stockpile number.
- Stockpiled materials will be protected from exposure to wind by storing the material in sheltered regions of the site.
- Soil waste categories will be individually segregated and all segregation, storage and stockpiling locations will be clearly delineated on the Site drawing.
- Any waste to be temporarily stockpiled will be stockpiled only on hard-standing or high-grade polythene sheeting to prevent cross-contamination of the soil below.
- Soil stockpiles will be sealed / covered polythene sheeting with to prevent run-off of rainwater and silt from the stockpiled material generation and/or the generation of dust.

8.1.3 Control and Management of Water

There will be no direct discharge to groundwater or surface water during the construction phase of the Proposed Development. However, the following measures will serve to prevent any negative effects occurring in downstream receiving waterbodies associated with any unauthorised surface and groundwater discharges from the site during the construction phase of the Proposed Development.

Personnel working at the site will be trained in the implementation of environmental control and emergency procedures. The CEMP and the relevant documents produced will be formulated in consideration of standard best international practice including but not limited to:

- Construction Industry Research and Information Association (CIRIA), 2001. Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors.
- Construction Industry Research and Information Association (CIRIA), 2006. Control of Water Pollution from Linear Construction Projects: Technical Guidance (C648).
- Construction Industry Research and Information Association (CIRIA), 2015. Environmental Good Practice onsite Guide. 4th edition (C741).
- Environmental Protection Agency, 2013. Storage and Transfer of Materials for Scheduled Activities.
- Enterprise Ireland BPGCS005, Oil Storage Guidelines.
- UK Environment Agency, 2004. UK Pollution Prevention Guidelines (PPG).
- Inland Fisheries Ireland, 2016. Guidelines on Protection of Fisheries during Construction Works In and Adjacent to Waters.

The following standard operational measures will protect the receiving surface water and groundwater environment during the construction phase of the proposed development:

- With the exception of rainfall, there will be no direct discharge of water to watercourses or ground during the construction phase of the Proposed Development.
- There may be a temporary increase in the exposure of the underlying shallow groundwater during excavation works. Where necessary, surface water runoff will be prevented from entering open excavations with sandbags or other approved methods proposed by the appointed contractor. Furthermore, the appointed contractor will ensure that machinery does not enter the groundwater if encountered during construction.
- The Main Contractor will ensure that any run-off from the site or any areas of exposed soil will be managed as required with temporary pumping and following appropriate treatment (e.g., settlement or hydrocarbon interceptor). Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to temporary onsite settlement ponds / silt busters where measures will be implemented to capture and treat sediment laden runoff prior to discharge at a controlled rate.
- Where dewatering of shallow groundwater is required or where surface water runoff must be pumped from the excavations, water will be managed in accordance with best practice standards (i.e., CIRIA C750), the CEMP and regulatory consents to minimise the potential impact on the local groundwater flow regime within the soil and bedrock.
- Unauthorised discharge of water (groundwater / surface water runoff) to ground, drains or watercourses will not be proposed. The Main Contractor will ensure that the discharge of water to ground, drains or watercourses will be in accordance with the necessary discharge licences issued by Uisce Eireann (UE) under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to sewer or from DLRCC under Section 4 of the Local Government (Water Pollution) Act 1977, as amended in 1990 for discharges to surface water.
- Under no circumstances will any untreated wastewater generated onsite (from equipment washing, road sweeping, etc.) be released to ground or to drains. Existing surface water drainage, if any, located along public roads will be protected for the duration of the works to ensure that any untreated wastewater generated onsite does not enter the public sewers.
- Any imported materials (i.e., aggregate materials) will be placed onsite in designated locations and double handling will be avoided. Where this is not possible, designated temporary material storage areas will be used.
- Temporary stockpiled materials will be managed to prevent runoff generation and wind-whipping of dust and placement of stockpiles on impermeable areas.
- Stockpiles of loose materials pending re-use onsite or removal offsite will be located as far as feasible from receiving waterbodies (a minimum set back of 20m from watercourses will be maintained) and will be appropriately sealed / covered and a silt fence or bunding will be installed around it to ensure no soils and sediments are washed out overland to the existing surface water networks.
- The performance of all surface water management measures including settlement ponds and silt fences will be monitored to ensure that they remain functional throughout construction phase of the Proposed Development. Where necessary, maintenance will be carried out to ensure that the measures continue to be effective. This will be particularly important after heavy rainfall events. The checks will be undertaken by the Environmental Manager. As a minimum, the surface water management measures will be checked weekly and after periods of heavy rainfall to ensure they remain fit for purpose and a record of these checks will be kept and signed off. It is noted that the frequency of monitoring will depend on the stage of

works, and local environmental conditions. The frequency of checks will be increased during critical works including the initial commissioning works, during concrete pours and after storm events.

- Precast concrete will be utilised where possible. However, where in-situ pours are required pumping of concrete will be monitored to ensure that there is no accidental discharge. All work will be carried out in the dry and effectively isolated from any drains. The production, transport, and placement of all cementitious materials will be strictly planned and supervised by the Main Contractor. A suitable risk assessment for wet concreting will be completed prior to works being carried out.
    - All ready-mixed concrete will be delivered to the site by truck. Shutters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed. Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening. Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete.
    - Concrete batching will take place offsite and surplus concrete will be returned to batch plant after completion of a pour. Under no circumstances is any excess concrete to be disposed of onsite. Wash down and wash out of concrete trucks will take place into a container located within a controlled bunded area which will then be emptied into a skip. The Main Contractor will dispose of all alkaline wastewaters and contaminated stormwater offsite in accordance with best practice procedures and all relevant waste management legislation.
- A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances. As the risk of the break-out of silt laden run-off is higher during these weather conditions, no work will be carried out during such periods, where possible.
- Where required, wheel washing facilities will be provided at the entry / exit point to the site so that traffic leaving the site compound will not generate dust or cause the build-up of aggregates and fine material in the public domain. Where necessary, additional measures (e.g., hardcore/stone surfaces along haul routes to prevent dirt and debris on wheels) will also be provided for site vehicles. The wheel wash will be maintained in a satisfactorily operational condition during all periods of construction. Wheel washings will be contained and treated prior to removal offsite in accordance with all relevant statutory legislation.
- Refuelling of plant and machinery onsite will take place in accordance with the refuelling procedures outlined in Section 8.1.1.
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the site and compliantly disposed offsite in accordance with best practice procedures and Section 8.1.1. Residual soil will be tested to validate that all potentially contaminated material has been removed.
- All drainage and water supply works will be in accordance with the UE Code of Practice for Wastewater and Water Supply, the Wastewater Infrastructure Standard Details (Document Number: IW-CDS-5030-01) and the Water Infrastructure Standard Details (Document Number: IW-CDS-5020-01). Drain inlets will be protected with a drain guard designed to filter oil and silt from stormwater run-off. sandbags will be placed around the inlet to provide additional protection from sediment. Inlet protection can only be removed once all construction activity that could generate sediment or result in emissions of other pollutants such as chemicals and fuel has ceased in a given location and the drainage infrastructure is operational (e.g., to allow for the discharge of stormwater from the roofs of newly constructed and completed dwellings into the stormwater network).

- Foul drainage from temporary welfare facilities during the construction phase of the Proposed Development will be discharged to temporary holding tank(s), the contents of which will periodically be tankered offsite to a licensed facility. All waste from welfare facilities will be managed in accordance with the relevant statutory obligations by tankering of waste offsite by an appropriately authorised contractor. Any connection to the public foul drainage network during the construction phase of the Proposed Development will be undertaken in accordance with the necessary temporary discharge licences issued by UE.

8.1.4 Control and Management of Works Adjoining Watercourses

All open waterbodies at the site (i.e., the Glenamuck_North and the Jamestown 10) will be protected for the duration of the works.

A minimum 10m buffer will be retained from all open waterbodies at the site (i.e., the Glenamuck_North and the Jamestown 10). Site traffic will only be permitted within this buffer to facilitate near-stream works for the construction of the proposed bridge crossing.

Buffer zones will be established by erecting a silt fencing or bunding along the length of the open waterbodies with cognisance to Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016). Silt fencing will comprise wooden posts and double walled geotextile membrane buried in an 'L' shape to a minimum depth of 250mm. The silt fencing will act in filtering any potential surface water run-off from the site generated during the proposed works and will be retained in place for the duration of the construction phase until the development is complete. Heras fencing will be installed in front of the silt fencing at the Site to prevent "Site creep", the progressive movement of site activities towards this silt fence. The project specific CEMP (which will be prepared by the main contractor in advance of construction works commencing) will identify how this silt curtain is to be installed and maintained throughout the construction phase.

The silt fences will be monitored to ensure that they remain functional throughout construction of the Proposed Development. Where necessary, maintenance will be carried out on the fences to ensure that they continue to be effective. This will be particularly important after heavy rainfall events. The checks will be undertaken by the Environmental Manager. The frequency of monitoring will depend on the stage of works, and local environmental conditions. Daily checks may be appropriate during the initial site clearance, during works in the vicinity of the open waterbodies and during and after storm events. Weekly or bi-weekly checks may be appropriate at other times

All works carried out in or adjacent to the referenced surface waters will adhere to the Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016), the Transport Infrastructure Ireland (TII) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (TII, 2008) and CIRIA C648 Control of Water Pollution from Linear Construction Projects (CIRIA, 2006).

All near-stream works will include the following measures:

- The stream crossings will be implemented as per a method statement developed by the appointed contractor in advance of construction works commencing and agreed with IFI as required.
- Entry to the surface waters by vehicles will not be permitted, while vehicle usage along the banks will be restricted as much as practicable. Any machines working in close proximity to the watercourse must be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels.

- Works will be carried out from the bank side, as best practice in-stream works will be restricted to the period 1st July through 30th September, to comply with the seasonal restrictions in salmonid rivers.
- Silt fences and other sediment control measures will be utilised as required to prevent sedimentation in the referenced surface waters.
- Regular monitoring of water quality upstream and downstream of the works area will be undertaken to detect any changes and take corrective actions if necessary.
- Existing vegetation will be preserved where possible and replant disturbed areas promptly to stabilise soil and reduce erosion.

Furthermore, works during the construction of the outfalls to the Glenamuck_North will include the following measures:

- The outfall headwalls will be constructed from precast concrete to allow their construction offsite, while hoisting of the structure will be carried out from the site side of the riverbank.
- Once excavations for the outfall trenches are complete, the base and sides of the trenches will be seeded with a native wetland wild flora seed mix, which will be allowed to establish for a 6–8-week period prior to the outfall trench becoming operational and receiving surface waters from the onsite drainage network. This is a grass mix with some wildflower elements which will aid the overall biodiversity approach/green infrastructure and provide “green” erosion prevention of the outfall channel and prevent siltation of the Glenamuck_North.

The contractor will employ an Environmental Clerk of Works (EnCoW) / Ecological Clerk of Works (ECoW) who will monitor water quality upstream and downstream of the area of works. The programme of water quality monitoring and locations of sampling will be agreed with DLRCC in advance of construction works commencing. However, it is anticipated that data on pH, electrical conductivity, and turbidity, suspended solids and hydrocarbons will be collected as follows:

- Monthly during general site works.
- Additional visits may be undertaken during key construction activities (to be agreed between the environmental specialist, the appointed contractor and DLRCC (e.g., during the construction of the bridge crossings, during installation of the proposed outfalls and stream crossings, during and immediately after clearance of on-site vegetation)).

Monitoring will be undertaken for a period of at least two months prior to works commencing and one-month post construction. Trigger concentrations will be agreed at commencement and based on the baseline established in the two months prior to works commencing. It is noted that where a deterioration in water quality is observed downstream of the site this will be brought to the attention of the contractor by the EnCoW / ECoW, and any suitable contingency measures will be instigated.

All monitoring data will be collated by the EnCoW /ECoW to show trends for indicator parameters pH, conductivity, turbidity or suspended solids and hydrocarbons, and will be shared with DLRCC as requested.

8.2 Operational Phase

Based on the design of the Proposed Development there are limited potential sources of contamination during the operational phase. Furthermore, the proposed attenuation design does not allow for infiltration to ground. Surface water will be managed in accordance with the principles and objectives of SuDS and the GDSDS to treat and

attenuate water prior to discharging offsite. Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be incorporated into the overall management strategy for the Proposed Development. This will ensure that there are no impacts on water quality and quantity (flow regime) during the operational phase of the Proposed Development.

Foul water during the operational phase of the Proposed Development will ultimately discharge via the Shanganagh-Bray WWTP to the Southwestern Irish Sea - Killiney Bay (HA10) Coastal Waterbody under the appropriate consents from UE. the Shanganagh-Bray WWTP is operated in accordance with relevant statutory approvals issued by UE. Foul water from the site will only be discharged to the UE network under the appropriate consents from UE, and therefore, the Proposed Development will not cause a potential impact on the WFD status of any receiving waterbody and any Natura 2000 sites associated with discharges from the site.

There is no other requirement for mitigation measures for the operational phase of the Proposed Development.

8.3 Residual Risk to Waterbody Status

The effects of the design avoidance and mitigation measures have been assessed and summarised in Table 8-1, which provides a summary of the predicted or potential status changes associated with the Proposed Development, with and without mitigation. In all cases, the proposed mitigation measures are sufficient to meet the WFD objectives. The Proposed Development will not cause any deterioration, and all mitigation measures will ensure compliance with the Directive's objective to maintain or improve water quality. Similarly, the objectives of the WFD Register of Protected Areas will not be compromised and their long-term integrity will be preserved.

Table 8-1. Summary of WFD Status for Unmitigated and Mitigated Scenarios

Name	EPA Code	Current Status (2019-2024)[1]	Current WFD Risk	Potential Unmitigated Status Change	Potential Mitigated Status Change
Construction Phase					
Surface Waterbodies					
Carrickmines_Stream_010	IE_EA_10C040350	Good	Not at Risk	Moderate	Good
Shanganagh_010	IE_EA_10S010600	Good	Not at Risk	Moderate	Good
Coastal waterbodies					
Southwestern Irish Sea - Killiney Bay (HA10)	IE_EA_100_0000	Good	Not at Risk	Good	Good
Groundwater Waterbodies					
Wicklow GWB	IE_EA_G_076	Good	At Risk	Poor	Good
Operational Phase					
Surface Waterbodies					
Carrickmines_Stream_010	IE_EA_10C040350	Good	Not at Risk	Good	Good

Name	EPA Code	Current Status (2019-2024)[1]	Current WFD Risk	Potential Unmitigated Status Change	Potential Mitigated Status Change
Shanganagh_010	IE_EA_10S010600	Good	Not at Risk	Good	Good
Coastal waterbodies					
Southwestern Irish Sea - Killiney Bay (HA10)	IE_EA_100_0000	Good	Not at Risk	Good	Good
Groundwater Waterbody					
Wicklow	IE_EA_G_076	Good	At Risk	Good	Good

Note:
1. The 4th cycle monitoring (2019–2024) has been published in Q4-2024 by the EPA, with results that form the basis of the next River Basin Management Plan (RBMP) 2027–2033.

8.4 Potential Impact on Protected Areas Objectives

Based on the findings of this assessment, it is considered that in applying the precautionary principle and assessing a worst-case scenario, which assumes implementation of standards mitigation, there is no identified potential negative impact associated with the Proposed Development on the Protected Areas individually or in-combination.

A review of Natura 2000 sites has been conducted to assess connectivity with the Proposed Development including a review of water dependant Qualifying Interests (QI) and Special Conservation Interests (SCIs). While hydrological / hydrogeological connectivity can extend over considerable distances, no water dependant Natura 2000 sites have been identified that have the potential to be adversely affected due to the separation distance combined with the natural dilution, attenuation, flow direction and dispersion processes that occur within intervening waterbodies. Based on the scale and nature of the proposed works, there are no water-dependent Qualifying Interests (QI) and Special Conservation Interests (SCIs) that have potential to be adversely affected by the Proposed Development.

8.5 Residual Cumulative Impacts

Cumulative effects are defined in the European Commission Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions, defines cumulative effects as:

"*Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project*".

Effects caused by the interaction of multiple impacts, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect in nature, arising from the accumulation of individually minor impacts that, when combined, may result in more significant environmental consequences. These effects may occur over time or across space and are particularly relevant where multiple developments interact with shared environmental receptors.

It is reasonable to assume that any approved, pending, or further information stage cumulative development has demonstrated (or will demonstrate prior to approval) no adverse environmental effects and the incorporation of good practice measures (e.g., construction phase and permanent SuDS, pollution prevention measures) into their

designs. Such measures would manage surface water runoff rate, quantity, and quality, resulting in no adverse effect on waterbody status or WFD objectives in general. As such, there are no likely significant cumulative effects predicted with the proposed Development and in conjunction with any other screened-in projects in any geographical area.

8.6 Potential Impact on Water Action Plan Programme of Measures

Based on the findings of this assessment, it is considered that in applying the precautionary principle and assessing a worst-case scenario the Proposed Development will have no adverse impacts on the implementation of the WAP Programme of Measures. Adverse impacts associated with historic urbanisation will be negated through the implementation of SuDS and appropriate treatment of foul effluent from the site.

9 CONCLUSIONS

The findings of the risk-based assessment identified that in the absence of any mitigation and avoidance measures there could be a potential impact on the waterbody status within receiving water bodies associated with the Proposed Development.

The standard mitigation measures as outlined above will prevent any impact on the receiving groundwater and surface water environment. Hence, the Proposed Development will not have any impact on compliance with the EU Water Framework Directive, European Communities (Environmental Objectives) Surface Water Regulations, 2009 (SI 272 of 2009, as amended 2012 (SI No 327 of 2012), and the European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010), as amended 2012 (SI 149 of 2012) and 2016 (S.I. No. 366 of 2016).

The Proposed Development will not cause a deterioration in the status of waterbodies hydrologically connected with the Proposed Development, taking account of design avoidance and mitigation measures that will be implemented. The Proposed Development will not jeopardise the objective to achieve 'good' surface water status or good ecological potential.

There will be no impact to the existing WFD status of waterbodies associated with the Proposed Development as a result of the Proposed Development taking account of embedded design avoidance and mitigation measures.

9.1 WFD Article 4 Objectives Compliance Statement

The assessment contained within this report has comprehensively demonstrated that the Proposed Development adheres to the Article 4 objectives of the Water Framework Directive (WFD). Applying the precautionary principle and evaluating a worst-case scenario, it is evident that there are no adverse impacts to the status of waterbodies, thus aligning with the objective to protect, enhance, and restore all bodies of surface water and groundwater, with the aim of achieving good surface water status by 2027.

Furthermore, the Proposed Development incorporates measures, such as Sustainable Drainage Systems (SuDS) and the appropriate management of construction stage runoff, which will prevent any deterioration in waterbody status and maintain high status where it already exists. Moreover, the necessary measures are being implemented with the aim of progressively reducing pollution in surface waters and groundwater, thereby fulfilling the objective of reducing pollution incrementally.

Regarding a derogation requirement, since none of the Article 4(7) criteria have been triggered, no Article 4(7) assessment is required. Therefore, authorisation for the Proposed Development may be permitted according to the Water Framework Directive (WFD).

Finally, the Proposed Development ensures that waterbodies associated with Protected Areas will not be subject to significant adverse effects, thereby safeguarding the environmental objectives set forth for such areas. Consequently, the proposed development is in full compliance with the overarching goal of achieving good surface water status by 2027 and maintaining the integrity of the water environment.

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