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7.1 Introduction

This Chapter includes additional information following Dun Laoghaire - Rathdown County Council (DLR CC) decision to request Further Information dated 25th March 2026 in respect of LRD26A/0051/WEB. In the interest of clarity and transparency, the additional information is shown as tracked changes to this document including any deletions arising from changes made on foot of the further information request.

This chapter of the EIAR was prepared to assess the potential significant effects of the Proposed Development on lands at 'St. Teresa's', Temple Hill, Temple Road, Monkstown, Blackrock, Co. Dublin. It evaluates the likely significant effects, if any, which the Proposed Development will have on land, soils, geology and hydrogeology.

This chapter contains necessary information as defined in the Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022). Reference is made to hydrology, but this aspect is covered in more detail in Chapter 8 (Hydrology).

The chapter initially provides a description of the receiving environment of the site and the potential impacts of the development. When assessing the potential impacts, this assessment considers the significance of the environmental attributes, and the predicted scale, and duration of the likely effects.

The chapter also outlines the proposed mitigation measures that will reduce or eliminate the identified potential impacts and define the residual effects of the Proposed Overall Development (the effect after the implementation of mitigation measures).

This chapter should be read in conjunction with Chapter 8 (Hydrology) and with Chapter 2 for the EIAR which does into further detail with regards to the site description.

7.1.1 Quality Assurance and Competency of Experts

This chapter of the EIAR has been prepared by Liana Rocha and Marcelo Allende of AWN Consulting.

Liana Rocha (BEng MSc) is a Senior Environmental Consultant with AWN Consulting, currently working within the water department. Liana holds bachelor's degrees in Environmental and Civil Engineering, a Master's in Geotechnical Engineering, and is currently completing a PhD in Geotechnical Engineering. She has worked on a wide range of projects including environmental investigations, environmental impact assessment reports, contaminated land remediation, geotechnical assessments, Due Diligence reporting, baselines studies, and monitoring of soil, surface water and groundwater, as well field sampling programmes in Brazil. Liana is a member of the International Association of Hydrogeologists (Irish Group).

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

7.2 Study Methodology

7.2.1 Criteria for Rating of Effects

The section establishes the criteria and guidance used to rate the significance of the potential impacts of the Proposed Development project on the land, soil, geological and hydrogeological aspects of the site and surrounding area.

This chapter is prepared in line with the 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022) and due consideration is also given to the guidelines provided by the Institute of Geologists of Ireland (IGI) in the document entitled 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements' (IGI 2013).

The document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the Transport Infrastructure Ireland (TII) formerly National Roads Authority (NRA) (TII, 2009) is referenced where the methodology for assessment of impact is appropriate. Furthermore, in line with the TII Guidelines, an assessment of the attribute importance has been undertaken in order to provide a basis for the assessment of impact provided. The attribute importance considers the potential as well as the existing use of the surface water features as a water resource (i.e., water supply, fisheries and other uses) as well as ecological habitat requirements. The TII criteria for rating the soil, geology and hydrogeology related attributes are presented in Appendix 7.1.

The quality, significance, and duration of the potential impacts, residual effects, and cumulative effects are described using standard EIA descriptive terminology (EPA, 2022) that is set out in Chapter 1 of this EIAR.

The principal attributes (and effects) to be assessed include the following:

- Geological heritage sites within the vicinity of/ within the perimeter of the Proposed Development site.
- Landfills, industrial sites in the vicinity of the site and the potential risk of encountering contaminated ground.
- The quality, drainage characteristics and range of agricultural use(s) of subsoil around the site.
- Quarries or mines in the vicinity and the potential implications (if any) for existing activities and extractable reserves.
- The extent of topsoil and subsoil cover and the potential use of this material on site as well as any requirement to remove it off-site as waste for disposal (D) or recovery (R) options.
- Classification (regionally important, locally important etc) and extent of aquifers underlying the site perimeter area and increased risks presented to them by the Proposed Development e.g. removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes, change in groundwater quality.
- Natural hydrogeological/ karst features in the area and potential for increased risk presented by the activities at the site.
- Groundwater-fed ecosystems and the increased risk presented by operations both spatially and temporarily.
- High-yielding water supply springs/ wells in the vicinity of the site to within a 3km radius and the potential for increased risk presented by the Proposed Development.

7.2.2 Relevant Legislation & Guidance

The baseline study and impact assessment will be carried out in accordance with the following key guidance and established best practice:

- Environmental Protection Agency (EPA) Advice notes on current practice in the preparation of Environmental Impact Statement (EPA, 2003) and Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2022a).

- TII/National Roads Authority Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (TII/formerly NRA, 2009).
- Transport Infrastructure Ireland - Road Drainage and Water Environment (TII, 2015).
- Institute of Geologists Ireland (IGI) - Geology in Environmental Impact Statements, a guide (IGI, 2002) and Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013).

Land, soil, geology and hydrogeology resource management in Ireland is dealt with in the following key pieces of legislation and guidelines:

- Institute of Geologists Ireland (IGI) -Geology in Environmental Impact Statements, a guide (IGI, 2002) and Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013).
- Waste Management Acts 1996 as amended.
- Environment Agency (EA), Land contamination: risk assessment (EA 2020).
- BS 10175:2011 + A2:2017 Investigation of potentially contaminated sites. Code of practice (British Standards Institute 2017).
- CIRIA C552 Contaminated Land Risk Assessment: A Guide to Good Practice (CIRIA 2001).
- TII/National Roads Authority Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (TII/formerly NRA, 2009).
- Transport Infrastructure Ireland, The Management of Waste from National Road Construction Projects (TII 2017).
- Environmental Protection Agency, Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites (EPA 2013).
- Local Authority planning guidance as applicable.
- Consolidated EIA Directive 2011/92/EU and 2014/52/EU.
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010 and S.I. No. 366 of 2016).

7.2.3 Sources of Information

Desk-based geological and hydrogeological information on the substrata underlying the extent of the site was obtained through accessing national databases and site archives. The collection of baseline regional data was undertaken by reviewing the following sources:

- Geological Survey of Ireland (GSI) - on-line mapping, Geo-hazard Database, Geological Heritage Sites & Sites of Special Scientific Interest, Bedrock Memoirs and 1:100,000 mapping.
- Teagasc soil and subsoil database.
- Ordnance Survey Ireland - aerial photographs and historical mapping.
- Environmental Protection Agency (EPA) – website mapping and database information.
- National Parks and Wildlife Services (NPWS) – Protected Site Register.

Site specific data was derived from the following sources:

- Site plans and drawings submitted with the planning application pack.
- Engineering Services Report (JJ Campbell & Associates, 2025).
- Construction & Environmental Management Plan (JJ Campbell & Associates, 2025).
- Ground Investigation Report (GII, 2019).
- Ground Investigation Report (GII, 2020).

7.3 The Existing Receiving Environment (Baseline)

7.3.1 Site Description

The Proposed Development site is located at Temple Hill, Temple Road, Monkstown, Blackrock, Co. Dublin and covers an area of approximately 4.56 hectares. The Proposed Development is bounded to the north by the N31 national road, while to the west and southeast the site is bounded by existing residential properties. The Rockfield Park playing pitches are located to the south of the Proposed Development. The site is currently a partially vegetated greenfield, with a convent building occupying a portion of the site, as shown in Figure 7.1.

The site topography ranges from 21 mOD along the southern boundary to 12.24 mOD at the intersection of St. Louise's Park and Temple Road. The site slopes generally in a southwest to northeast direction.

The Proposed Development will consist of revisions to development previously permitted under SHD ABP-303804-19 (291 no. units permitted) to provide for a new residential scheme of 414 no. residential units in total (an uplift of 123 no. units overall). Figure 7.2 below presents the proposed site layout.



Figure 7.1 – Site Location Map



Figure 7.2 – Proposed Site Layout (Source: O'Mahony Pike Architects)

7.3.2 Existing Land Use and Site History

The site is currently a greenfield area, partially vegetated in places, with a convent building occupying a portion of the site. Historical Ordnance Survey maps (www.tailte.ie) were examined during the preparation of this EIAR Chapter.

The 1830s 25-inch Ordnance Survey maps indicate that the area within the subject site boundary was largely undeveloped, comprising open land with limited built structures, including a small cluster of buildings associated with institutional use and an area of former cemetery use to the west. The surrounding lands comprised a mix of established residential development to the north and more rural open land to the south and east, with the main road network already established at the time (see Figure 7.3 below).

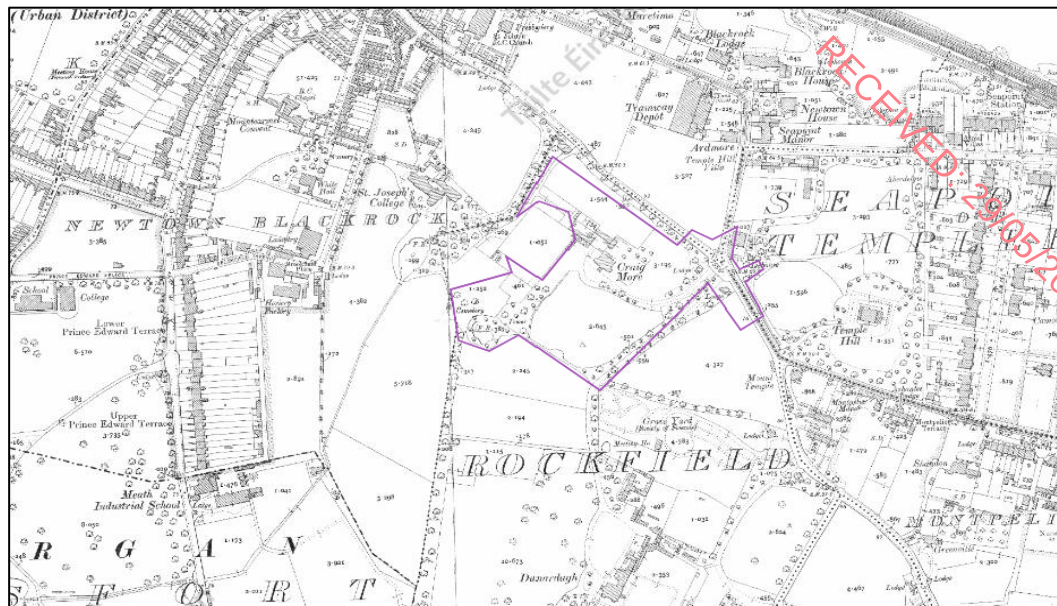


Figure 7.3 - 25-inch Historic Map (site boundary indicative only)

The 1995 aerial image shows the subject site located within a predominantly urban setting, surrounded by established residential development and associated road infrastructure. At the time of the imagery, the site itself comprised a mix of open land and built structures. The site is connected to the local road network and forms part of a transitional area between open land and consolidated urban development (see Figure 7.4 below).

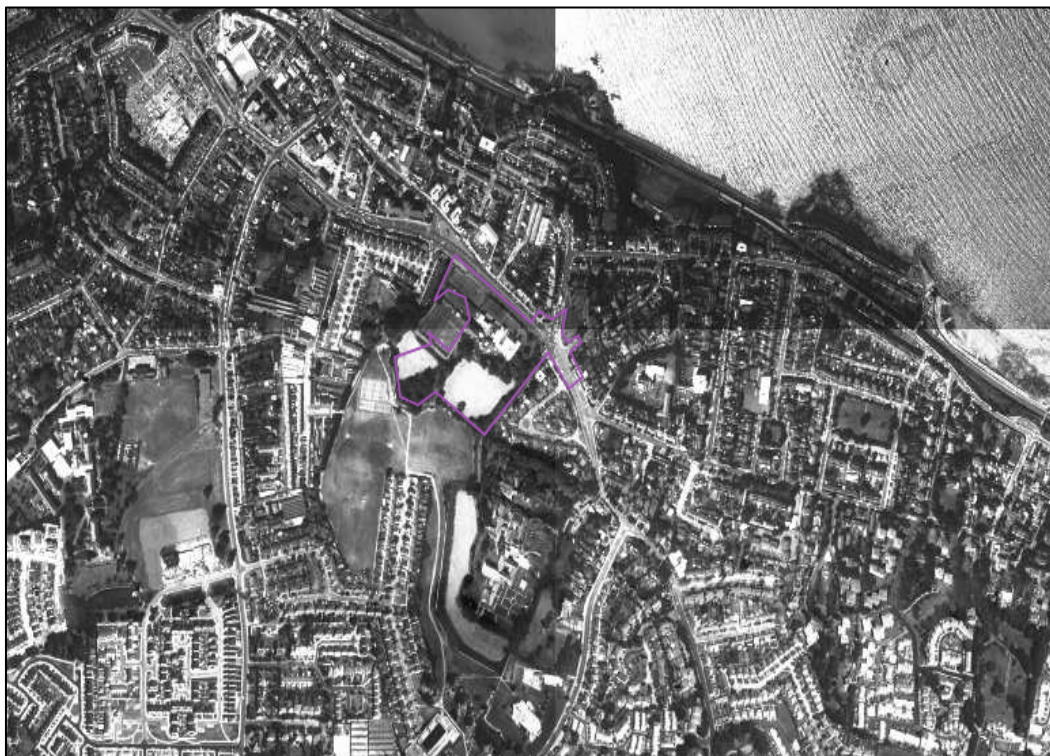


Figure 7.4 - Imagery Black and White Map 1995 (site boundary indicative only)



Figure 7.5 - Imagery Colour Map 1996-2000 (site boundary indicative only)



Figure 7.6 - Imagery Colour Map 2013- 2018 (site boundary indicative only)

Figure 7.5 and Figure 7.6 show that the site comprises a mix of open green areas and convent buildings within the site boundary. The surrounding area is predominantly residential, with a well-developed road network. The general layout and distribution of buildings and open spaces within the site have remained largely unchanged from 1995 to the present day.

7.3.3 Surrounding Land Use

There are no licenced facilities within the site boundary or adjacent to the Proposed Development. Table 7.1 below shows the closest Industrial Emissions or Integrated Pollution Control (IE/IPC)

facilities to the Proposed Development according to the EPA (2025) within a 3 km radius of the Proposed Development.

Embecta Penel Limited (P0648) is the nearest of these facilities, located c. 2.5km south from the Proposed Development. There is no hydraulic connectivity between this site and Proposed Development.

Registration number	Name	Category	License Type	Distance (km)
P0648	Embecta Penel Limited	Industry	IPC	2.5km south
P0019	Amgen Technology (Ireland) Unlimited Company	Industry	IEL	2.97km south
P0216	Sytheses Limited	Industry	IEL	2.83km northwest

Table 7.1 - EPA licensed facilities nearby to the proposed development site (EPA, 2025)

7.3.4 Site Investigation

Two preliminary site investigations have been carried out at the site by Ground Investigations Ireland Limited, in December 2018 and November 2020. These investigations (GII, 2019; GII, 2020) indicated a consistent sequence of strata encountered across the site, generally comprising:

- Topsoil: Topsoil was encountered in most of the exploratory investigation points and was present to a maximum depth of 0.40 mBGL (metres below ground level). Tarmac surfacing was present typically to a depth of 0.10 mBGL.
- Made ground: Made Ground deposits were encountered beneath the Topsoil/Surfacing and were present to a relatively consistent depth of between 0.70 and 1.2 mBGL. These deposits were described generally as brown slightly sandy slightly gravelly Clay with occasional fragments of red brick.
- Cohesive deposits: Cohesive deposits were encountered beneath the Made Ground and were described typically as brown/light brown slightly sandy gravelly CLAY with occasional cobbles and boulders.
- Granular deposits: Granular deposits were encountered at the base of the cohesive deposits and were typically described as Grey/brown clayey sandy sub rounded to sub angular fine to coarse GRAVEL with occasional cobbles and rare boulders.
- Bedrock: The bedrock, described as medium strong to strong light brownish grey coarsely crystalline GRANITE, was encountered in depth ranging from 2.10 mBGL in BH03 to a maximum of 8.0 mBGL in BH-A.

The location of the site investigation exploratory points are shown in Figure 7.7.

The site investigation reports are provided in Appendix L of the Engineering Services Report (JJ Campbell & Associates, 2025).



Figure 7.7 – Historical Site Investigation points

7.3.5 Soils and Subsoils

The GSI/Teagasc (2025) mapping indicates the presence of three soil types across the site, identified as made ground, mineral poorly drained (mainly basic) – BminPD and deep well drained mineral (mainly basic) - BminDW.

The Quaternary Period is the final stage of the geological time scale. This period includes the start of the Ice Age (approximately 1.6 million years ago), known as the Pleistocene Epoch right through to the postglacial period, known as the Holocene Epoch, which began 10,000 years ago and extends from the Pleistocene to the present day.

The Pleistocene Epoch in Ireland began when there was a significant cooling of the Earth's climate and was characterised by alternating extended periods of very cold conditions, during which time much of the country was covered by an ice sheet. These colder periods were interspaced with warmer periods, known as interglacial, which lasted for approximately 10,000 years at a time.

According to GSI (2025), the quaternary sediments in the area of the subject site indicate that the principal subsoil type comprises Limestone till Carboniferous (TLs; i.e. Till derived from limestones), which is a low-permeability cohesive deposit, as shown in Figure 7.8. This is consistent with the findings of the site investigations mentioned in Section 7.3.4 above.



Figure 7.8 - Quaternary Geology in the vicinity of the Proposed Development

7.3.6 Bedrock Geology

The Geological Survey of Ireland (GSI, 2025) identifies the bedrock underlying the proposed site and its surrounding area as comprising of the Type 2p microcline porphyritic (New Code: IDNLGRP; Stratigraphic Code: Nt2p), part of the Caledonian System, which consists mainly of granite with microcline phenocrysts (refer to Figure 7.9 below).



Figure 7.9 – Bedrock Geology (GSI, 2025)

7.3.7 Geological Heritage Sites

According to the Geological Survey of Ireland (GSI, 2025) the proposed site development does not lie within or is in close proximity to any Geological Heritage Sites. The nearest site is Backrock Breccia (Site Code: DLR003) located c. 630m north of the site, as shown in Figure 7.10.



Figure 7.10 – Geological Heritage Sites (GSI, 2025)

7.3.8 Economic Geology

The GSI (2025) mineral database was consulted to determine whether there were any mineral sites in close proximity to the study area. There were 8 mineral sites identified within a 5 km radius of the proposed site are presented in Table 7.2 below.

Mineral Location Ref.	Mineral Type	Key Mineral	Description	Comments	Location	County
706	IGGR	Granite	Non-Metallic	Inactive granite quarry	Kilbogget, 4.99km south	Dublin
3323	nmr	No mineral recorded	Non-Metallic	Architectural and monumental stone works	Murphystown, 4,3 west	Dublin
2117	CLBR	Clay & Brick	Non-Metallic	Location of Irish Ceramic Industries Ltd. site in glacial	Kill of the Gra., 2.2km southwest	Dublin
2120	CLBR	Clay & Brick	Non-Metallic	Bricks made at this area in the 1880s	Foxrock, 3.1km west	Dublin
2121	CLBR	Clay & Brick	Non-Metallic	Clay pits, pottery works and a brickfield noted	Woodpark, 2.88km south	Dublin

Mineral Location Ref.	Mineral Type	Key Mineral	Description	Comments	Location	County
5036	IGGR	Granite	Non-Metallic	Once quarried to build the Townhall, Kingstown	Glenageary, 3.7km south	Dublin
5038	IGGR	Granite	Non-Metallic	Granite has been quarried in the area	Bullock, 4.6km southeast	Dublin
5041	IGGR	Granite	Non-Metallic	Two quarries now filled up	Dun Laoghaire, 2.8km southeast	Dublin

Table 7.2 – Mineral Localities within 5km of the site

7.3.9 Karst Landforms

Karst is a landscape with distinctive hydrology and landforms that arise when the underlying rock is soluble. Although karst can develop on evaporate rocks such as gypsum and siliceous rocks such as quartzite, the vast majority of karst landforms are found on carbonate rocks, such as limestones. Karst landscapes may have sinkholes, caves, enclosed depressions, disappearing streams, springs and sinkholes.

No karst landforms have been identified within the site boundary or in the vicinity of the Proposed Development. The closest karst feature is a spring (St. Doolaghs Well) located c.13km north of the subject site (GSI, 2025).

7.3.10 Geohazards

Much of the Earth's surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating slope failure. Instability is often significantly increased by man's activities in building houses, roads, drainage and agricultural changes. Landslides, mud flows, bog bursts (in Ireland) and debris flows are a result. In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff landslides and falls lead to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities.

Based on the GSI spatial map viewer, the landslide susceptibility classification within the site boundary is 'Low' (GSI, 2025). Due to the local topography and the underlying strata, there is a negligible risk of a landslide event occurring at the site. There are no active volcanoes in Ireland so there is no risk from volcanic activity.

7.3.11 Aquifer Classification

The GSI has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the area extent of the aquifer (km²), well yield (m³/d), specific capacity (m³/d/m) and groundwater transmissivity (mm³/d). There are three main classifications: regionally important, locally important and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (LI). Similarly, poor aquifers are classed as either generally unproductive except for local zones (PI) or generally unproductive (Pu).

The GSI (2025) classifies the principal aquifer types in Ireland as:

Bedrock Aquifer

- Rkc – Regionally Important Aquifer – Karstified (conduit)
- Rkd – Regionally Important Aquifer – Karstified (diffuse)
- RK – Regionally Important Aquifer – Karstified
- Rf – Regionally Important Aquifer – Fissured bedrock
- Lm – Locally Important Aquifer – Bedrock which is Generally Moderately Productive
- Lk – Locally Important Aquifer – Karstified
- LI – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones
- PI – Poor Aquifer – Bedrock which is Generally Unproductive except for Local Zones
- PU – Poor Aquifer – Bedrock which is Generally Unproductive

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Gravel Aquifer

- Lg - Locally Important Aquifer - Sand & Gravel
- Rg - Regionally Important Aquifer - Sand & Gravel

According to GSI (2025), the bedrock aquifer underlying the site is classified as a Poor Aquifer (PI), i.e. Bedrock which is Generally Unproductive except for Local Zones as presented in Figure 7.11. The potential for vertical or horizontal migration within this type of aquifer is poor as fractures will be disconnected. As such the aquifer is not a significant pathway for off-site migration.



Figure 7.11 – Bedrock Aquifer

The Proposed Development is within the 'Kilcullen' groundwater body (GWB) (European Code: IE_EA_G_003) and is classified as 'Poorly productive bedrock'.

The Kilcullen GWB contains areas of northeast Wicklow, northwest Kildare and south Dublin. The area has a varied topography with the Wicklow and Dublin mountains defining the topographic boundary to the south and east and the very flat areas of the Kildare low lands. The boundary of the GWB is defined to north and west by the geological contact between the Lower Paleozoic rocks and the limestones of the Dublin Basin. The Kilcullen GWB is composed primarily of low permeability rocks, although localized zones of enhanced permeability do occur. Groundwater flow occurs mostly in a shallow upper weathered zone, deeper groundwater flow is possible along

fractures, joints and major faults. Recharge occurs diffusely through the subsoils and via outcrops. There are large areas where the rock is close to surface, which would suggest high potential recharge values, but calculations must consider the effect of rejected recharge from the lower permeability rocks. The aquifers within the GWB are generally unconfined, but may become locally confined where the subsoil is thicker and/or lower permeability. Groundwater flow is considered to recharge and discharge on a local scale. Drainage density values suggest shorter flow paths in the granites than on the flatter Lower Paleozoic's. Groundwater discharges to the numerous small streams crossing the aquifer, to springs and seeps (GSI, 2004).

7.3.12 Aquifer Vulnerability

Aquifer vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures/ fractures, the main feature that protects groundwater from potential contamination, and therefore the most important feature in the protection of groundwater, is the subsoil (which can consist solely of or of mixtures of peat, sand, gravel, glacial till, clays or silts).

Groundwater vulnerability is an indication of how easily the aquifer can become contaminated by human activity. It is dependent on the thickness and permeability of the overlying soils and depth to the water table. For example, a bedrock aquifer with minimal thickness of overburden or with a thin layer of permeable overburden will be more vulnerable to contamination than a bedrock aquifer which has a thick layer of low permeability overburden. Extreme groundwater vulnerability is also associated with karst landforms as these are a direct pathway for water and contaminants to enter the aquifer from the surface.

According to GSI regional mapping, the majority of the subject site has a 'High' groundwater vulnerability rating, corresponding to a general overburden depth potential of 3–5 m, while a western portion of the site is classified as 'Moderate', corresponding to an overburden depth potential of 5–10 m, as shown in Figure 7.12 (GSI, 2025). It should be noted that aquifer vulnerability classifications are primarily based on the permeability and thickness of subsoils (refer to Table 7.3 below).

Historical site investigations (GII, 2019; GII, 2020) recorded depths to bedrock ranging from 2.1 mBGL to 8.0 mBGL, which is consistent with the classification of aquifer vulnerability ranging from 'High' to 'Moderate' across the area.

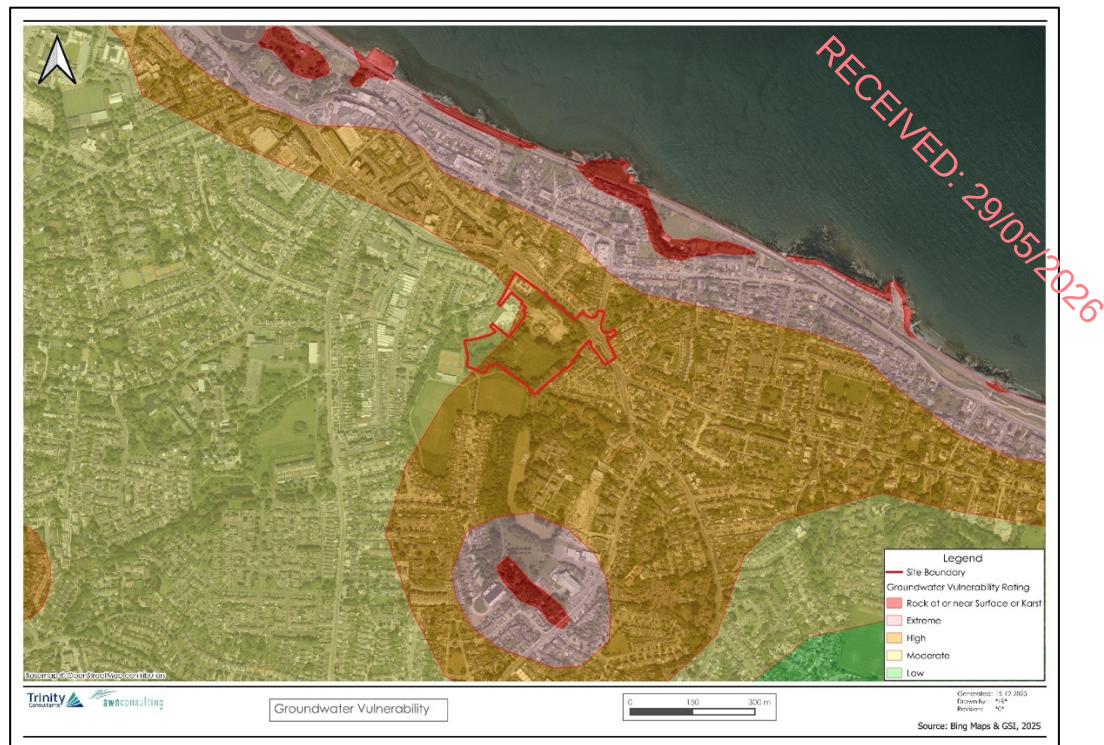


Figure 7.12 - Aquifer Vulnerability Rating

Vulnerability Rating	Mineral Type	Key Mineral	Description	Comments	Location
	Subsoil Permeability (type) and Thickness			Unsaturated Zone	Karst Features
	High Permeability (sand/ gravel)	Moderate Permeability (e.g. sandy subsoil)	Low Permeability (e.g. clayey subsoil, clay, peat)	(Sand / gravel aquifers only)	(<30 m radius)
Extreme (E)	0 – 3 m	0 – 3 m	0 – 3 m	0 – 3 m	-
High (H)	>3 m	3 – 10 m	3 – 5 m	>3 m	n/a
Moderate (M)	n/a	>10 m	5 – 10 m	n/a	n/a
Low (L)	n/a	n/a	>10 m	n/a	n/a
Notes: (1) n/a: Not applicable (2) Precises permeability values cannot be given at present (3) Release point of contaminants is assumed to be 1 – 2 m below ground surface					

Table 7.3 – Vulnerability Mapping Guidelines (Source: DoELG, EPA, GSI, 1999)

7.3.13 Groundwater Wells

A search of the GSI groundwater well database was conducted to identify registered wells in the vicinity of the proposed development. It should be noted that not all wells are registered in Ireland. There is no. 1 registered well within a 3km radius of the Development site. This well is located c. 2.0km southwest of the proposed development site, within Foxrock Townland, Co. Dublin. The recorded source use of the well is classified as “other”, with a moderate yield class and a yield of 54.5 m³/day.

7.3.14 Groundwater Quality

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

Presently, the Kilcullen has a WFD status of "Good" (WFD Period: 2019-2024) and a WFD risk score (3rd Cycle) of "At Risk" of not achieving good status (see Figure 7.13 below).



Figure 7.13 - Ground Waterbody WFD Quality Status 2019-2024

7.3.15 Groundwater Dependent Terrestrial Eco-Systems (GWDTEs)

Groundwater-dependent terrestrial ecosystems (GWDTEs) are defined as habitats/species that are dependent on groundwater to maintain the environmental supporting conditions required to sustain that habitat and/or species (EPA, 2008). Groundwater may provide either a direct input, such as in turloughs, fens and petrifying springs or, alternatively, the groundwater may have an indirect influence in maintaining high and stable water levels within the habitat, such as with raised bogs. Groundwater bodies are subject to a range of pressures which can result in significant damage to GWDTEs depending on the susceptibility of the pathway and the sensitivity of the receptor.

There are no identified GWDTE's in the vicinity of the Proposed Development.

7.3.16 Rating of Site Importance of the Hydrogeological Feature

Based on the TII methodology (2009) (see Appendix 7.1) the importance of the hydrogeological features at this site is rated as 'Low', based on the assessment that the attribute has a low-quality significance or value on a local scale, given that the bedrock aquifer underlying the site is classified as a Poor Bedrock Aquifer. Additionally, there are no recorded Public Supply Source Protection Area or Group Scheme Preliminary Source Protection Areas in the vicinity of the Proposed Development site.

7.3.17 Rating of Site Importance of the Geological Feature

Based on the NRA/TII methodology, the criteria for rating the importance of geological features, the importance of the soil feature at this site is rated as 'Low' Importance (refer to Appendix 7.1). This is based on the assessment that the attribute has a low quality, significance or value on a local scale.

7.3.18 Conceptual Site Model

AWN have developed a conceptual site model (CSM) in order to identify any likely Source-Pathway-Receptor linkages relating to the site and the Proposed Development.

The site is underlain by a 'Poor Aquifer' and in a regional scale, by the Kilcullen Groundwater Body (GWB) (European Code: IE_EA_G_003), which has been investigated by the GSI and is described as a 'Poorly productive bedrock (PI)'. The primary characteristic of this aquifer is that flow paths are generally not connected and limited to within the upper weathered zones identified.

The GSI/ Teagasc mapping shows the presence of three soil types across the site, identified as made ground, mineral poorly drained (mainly basic) – BminPD and deep well drained mineral (mainly basic) - BminDW. The quaternary sediments in the area of the subject site comprise Till derived from limestones, which is a low-permeability cohesive deposit.

The bedrock aquifer underlying the majority of the Proposed Development site is classified with 'High' vulnerability which indicates a general overburden depth potential of 3–5 m, while a western portion of the site is classified as 'Moderate', corresponding to an overburden depth potential of 5–10 m of low-permeability cohesive deposit.

Historical site investigations (GII, 2019; GII, 2020) identified a consistent subsoil profile across the site, comprising topsoil to a maximum depth of 0.4 mBGL, underlain by made ground to depths of approximately 0.7–1.2 mBGL. These deposits are in turn underlain by cohesive materials described as clay, with occasional cobbles and boulders. Granular deposits were encountered locally at the base of the cohesive deposits, beneath which granite bedrock was recorded at depths ranging from 2.1 mBGL to 8.0 mBGL, which is consistent with the classification of aquifer vulnerability ranging from 'High' to 'Moderate' across the area.

A Hydrogeological cross section has been prepared to support the conceptual understanding of the conditions within the study area in relation to its interaction with the identified surface water bodies. This section is based on borehole data from the site investigations carried out in the area (GII, 2019; GII, 2020) and are presented in Figure 7.14 below.

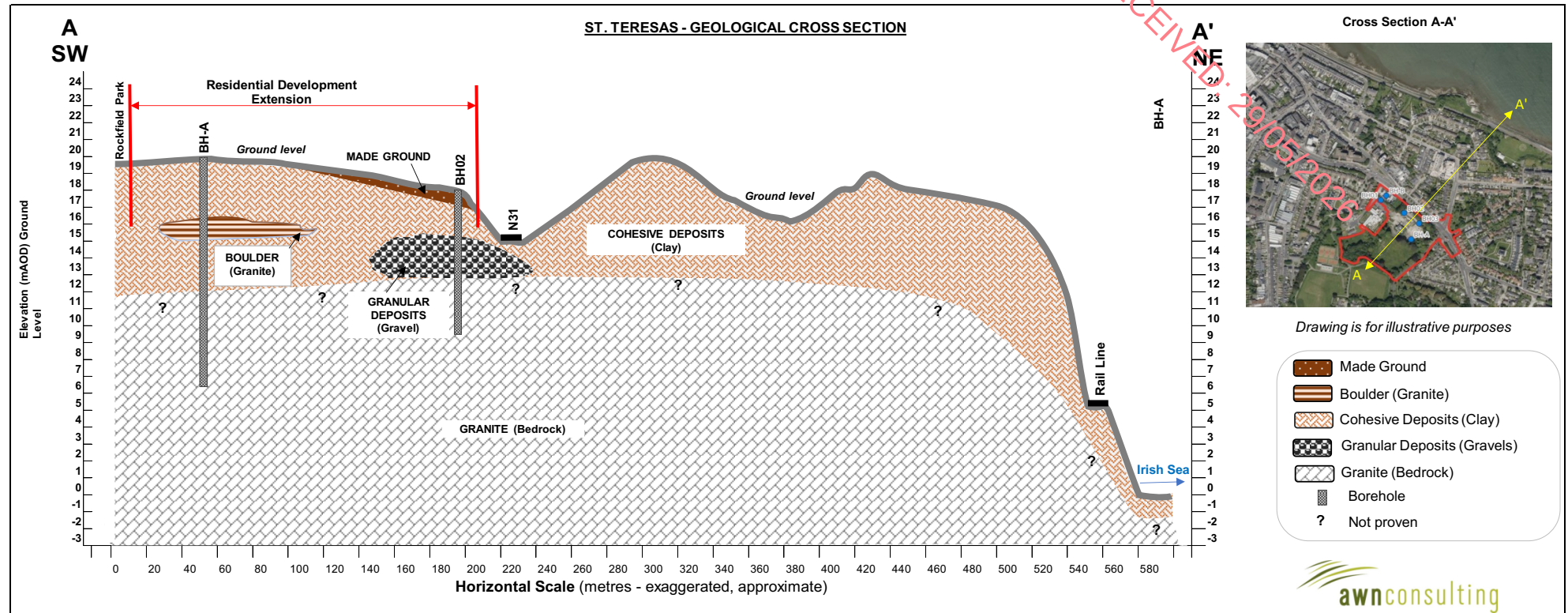


Figure 7.14 - Hydrogeological cross section A-A'

7.4 Characteristics of the Proposed Development

The purpose of this section is to provide an overview of the key relevant details of the demolition, construction and operational phases of the Proposed Development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development package. For a more comprehensive understanding of the Proposed Development, please refer to Chapter 2 'Description of the Proposed Development' of the EIA Report. Chapter 2 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant document in order to define the Proposed Development. The proposed site layout is also detailed in Appendix 1-1.

7.4.1 Demolition Stage

To facilitate the development, demolition works are required, the majority of which have been completed as per the parent planning application. The demolition works of the Proposed Development are limited to surface-level activities and do not involve any excavation works. As a result, the impact on the land, soils and hydrogeology is minimal.

The demolition process focuses on dismantling and removing structures, buildings and infrastructure to accommodate the new development and facilitation works, without disturbing the underlying soil or altering the landscape. This approach ensures that there are no significant effects on the land's composition, stability, or fertility. The absence of excavation works means that there is no disturbance to the natural soil structure, preventing potential soil erosion or compaction.

In addition, all waste materials will be dealt with in accordance with regional and national legislation. Time and resources will be dedicated to ensuring efficient waste management practices and waste arisings will be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate.

Therefore, there will be no requirements for mitigations for land, soil, geology or hydrogeology during the demolition phase of the development.

7.4.2 Construction Stage

The activities required for the construction phase of the Proposed Development represent the greatest risks of potential impact on the land, soils, geological and hydrogeological environment. These activities primarily pertain to the site preparation / enabling works, excavation and infilling activities required to facilitate construction of the Proposed Development.

Accidental Spills, Leaks and Discharges

There is potential for pollutants associated with construction activity, such as hydrocarbons, oils, and other contaminants, to impact the site. If a spill occurs, contaminated water and collected surface water run-off from construction areas can pose a short-term risk to the underlying subsoil and rock if the contaminated water is allowed to percolate to the aquifer unmitigated which could contribute to localized contamination.

Site Levelling and Excavations

The Proposed Development requires soil to be excavated to facilitate construction of foundations, basements, installation of underground services and for levelling of the site. Rock excavation is not anticipated, based on the fact that the site investigations indicate that the underlying rock is below formation level for the proposed basements and buildings.

The project engineers J.J. Campell and Associates have estimated that c. 12,000 m³ of material will need to be excavated to do so. It is currently envisaged that approximately 10,800 m³ of the excavated material will be reused onsite, with the remaining material removed from the site. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

As outlined above, it is estimated that approximately 1,200m³ of material will be excavated and subsequently removed and transported off-site. This activity may temporarily increase the vulnerability of the underlying 'Poor Aquifer'.

During the excavations for foundations, no significant dewatering is expected given the low permeability overburden underlying the site. Bedrock would not be affected by excavations work given the expected depths of bedrock, based on the fact that the site investigations indicate that the underlying rock is below formation level for the proposed basements and buildings. However, if pumping of standing or pooled surface water becomes necessary during and after heavy rainfall events, it will occur via suitably installed dewatering wells/sumps containing pumps to abstract groundwater and surface water (rainfall landing on the site). Dewatering is necessary to create a dry working environment and prevent water from seeping into the excavation and flooding the construction site.

Storage of soils/aggregates

The employment of good construction management practices and full adherence to a Construction Environmental Management Plan (CEMP) will minimise the risk of pollution of soil, storm water run-off, or groundwater. Such practices include the proper storage of spoil / loose materials on site, such as excavated materials to be used for landscaping purposes. Aggregate materials such as sands and gravels will be stored in clearly marked receptacles in a secure compound area within the contractors' compound on site.

Temporary storage of spoil will be managed to prevent accidental release of dust emissions and uncontrolled surface water run-off which may contain sediment and solid matter. Any excavated material temporarily stockpiled onsite for re-use during reinstatement will be managed to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment etc.

Storage of Hazardous Materials

During the construction phase there will be a requirement for the temporary storage of fuels. Liquid materials i.e., fuel storage will be located within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications – BS EN 1992-3:2006) to prevent spillage.

Construction activities will necessitate storage of cement and concrete materials, temporary oils, and fuels on site. Small localised accidental releases of contaminating substances including hydrocarbons have the potential to occur from construction traffic and vehicles operating on site. There is limited potential for leaks or spills of petroleum hydrocarbons during the construction of the Proposed Development. Unmitigated leaks or spills may lead to contamination of soil and/or groundwater. Soils that are contaminated by petroleum hydrocarbons can affect soil health.

Import/Export of Materials

There will be a requirement for deliveries of imported engineering fill (sands and gravels), and other construction materials including, steel structure, concrete, cladding, ducting and piping. Construction materials will be brought to site via road.

A 'Just in Time' delivery system will operate to minimise storage of materials. Construction materials will be transported in clean vehicles. Lorries/trucks will be properly enclosed or covered during transportation of friable construction materials to prevent the escape of material along public roadways. Where possible it is proposed to source general construction materials from the local area to minimise transportation distances.

Soil requiring offsite removal will be removed from site regularly to ensure there is minimal need for stockpiling. Surplus soil material will be transported off site and disposed of at a fully authorised soil recovery site. It is predicted that c. 1,200 m³ of excavated material will be removed from the site.

7.4.3 Operational Stage

The Proposed Development will result in the increase in hardstanding area. This provides protection to the underlying aquifer but also reduces local recharge in this area of the aquifer. As the aquifer is classified as a 'Poor Aquifer (PI) - Bedrock which is Generally Unproductive except for Local Zones', which is relatively unproductive and will have no significant change in the natural hydrogeological regime. The operational stage of the development will not involve further disturbance to the topsoil, subsoils and geology of the area. Increase in hardstand could have a local effect on the land, soils, geology and hydrogeology.

It should be noted that there is no requirement for bulk fuel or diesel storage during the operational stage of the Proposed Development.

Therefore, there will be no requirements for mitigations for land, soil, geology or hydrogeology post construction phase of the development.

7.5 Potential Impacts of the Proposed Development

An analysis of the potential effects of the Proposed Development on the land, soils, geological and hydrogeological environment during the demolition, construction and operational phases are outlined below. Due to the inter-relationship between land, soils, geology and hydrogeology with hydrology, the following impacts discussed will be considered applicable to both Chapter 7 (Land, Soils, Geology, Hydrogeology) and 8 (Hydrology) of this EIA Report. Mitigation measures included in the design of this project to address these potential impacts are presented in Section 7.8.

7.5.1 Demolition Stage

The site contained existing buildings to be demolished as part of the parent permission. The likelihood of significant effects on the land, soils, geology and hydrogeology during the demolition phase was minimal due to the demolition works of the Proposed Development being limited to surface-level activities with no excavation works. The absence of excavation works means that there is no disturbance to the natural soil structure, preventing potential soil erosion or compaction. As a result, the impact on the land and soils is minimal and no significant effects on the land's composition, stability, or fertility are anticipated.

Overall, the surface-level demolition works have a negligible impact on land, soils, geology and hydrogeology preserving their integrity and minimizing any potential environmental consequences. In the absence of mitigation, the effect on land, soils, geology and hydrogeology is likely to be **neutral, imperceptible and short-term**.

Refer to Chapter 15– Waste Management of this EIAR for further information on predicted on and off-site reuse, recycle and disposal rates for demolition waste.

7.5.2 Construction Stage

Potential Impacts on Land, Soils, **Bedrock** and Geology

Soil requiring removal offsite will be removed regularly to ensure there is minimal need for stockpiling. Some of the material will be re-used on site for backfill. Any surplus material will be transported off site and disposed of at a fully authorised soil recovery site. It is predicted that c. 12,000 m³ of soil will be excavated and 1,200 m³ will be transported off site.

As stated above, the excavation of topsoil and subsoil will be required to facilitate construction of foundations, basements, installation of underground services and for levelling of the site. Local removal and reinstatement (including infilling) of soil within the development area will increase the aquifer vulnerability during construction prior to paving and installation of stormwater drainage and services. Capping of significant areas of the site by hardstand/building following construction and installation of drainage will minimize the potential for contamination of the aquifer beneath the site.

Further to the excavation works described above, the proposed piled foundations have the potential to interact with the underlying geological strata, including bedrock, where piling, coring

or excavation through rock is required. Based on the available geotechnical information, significant impacts to bedrock are not anticipated. The proposed excavation for Block B is estimated to extend to approximately 8.0 m BGL and may penetrate weathered granite between approximately 6.8 m BGL and the base of the excavation. The excavation for Block A may not encounter bedrock, as bedrock was not recorded until approximately 8.0 m BGL in this area. Therefore, any potential interaction with bedrock is expected to be limited and localised. Where weathered rock is encountered, it is expected to be excavatable using conventional excavation equipment, although zones of more competent rock may require specialist techniques. Potential impacts associated with the proposed piled foundations and any associated excavation in rock are therefore limited to localised disturbance of weathered bedrock, generation of rock arisings, localised vibration during piling or rock breaking, and potential groundwater ingress where piling or excavation intersects water-bearing strata.

In the absence of mitigation measures the potential impacts during the construction phase on land, soils and geology are **negative, significant and short-term**. In relation to bedrock, potential impacts associated with the proposed piled foundations are **negative, imperceptible and short-term**.

Potential Impacts on Groundwater Quality

There is potential for run-off water to become contaminated with pollutants released during construction activity. If not mitigated, contaminated water can pose a temporary risk to the underlying 'Poor Aquifer' i.e. Kilcullen groundwater body (GWB). During construction of the development, the potential of contamination is associated with the following sources:

- Suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates)) – arising from excavation and ground disturbance;
- Excavations/ top and subsoil stripping- Increase sediment run off (erosion during rainfall periods), pollutant mobilisation (heavy metal runoff), loss of vegetation;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons and other construction chemicals (ecotoxic) – accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms. Construction phase sewerage may initially need to be contained in a tank and taken off site by tanker for disposal at a licensed waste management facility, before connection to the sewer line can be made.

In the absence of mitigation, rainfall run-off during the construction phase may contain increased silt levels or otherwise become polluted from construction activities. Suspended solids in runoff water may result in an increase in suspended sediment load, resulting in increased turbidity, which may in turn impact on local infiltration capacity, downstream infrastructure or watercourses. Concreting operations pose a potential risk of discharging concrete materials into exposed surfaces and percolate to the underlying groundwater. Concrete, especially the cement component, has a high alkalinity level. There is also the potential risk of unintentional discharge of stored materials like fuels, oils, and paints, which could have negative impacts on the underlying groundwater.

There are no potential impacts from wastewater on the hydrogeological environment as this will be discharged of appropriately.

In the absence of mitigation measures, the potential impacts during the construction phase on groundwater quality are **negative, slight and short term**.

Potential Impacts on Groundwater Flow and Quality

Surface water runoff during the construction phase may contain increased silt levels or become polluted from construction activities. Runoff containing large amounts of silt can cause damage to surface water systems and receiving watercourses. Silt water can arise from dewatering excavations, exposed ground, stockpiles and access roads.

The gradual introduction of impermeable surfaces and the compaction of soils across the construction site as a result of the land clearing and earthworks will reduce the infiltration capacity and increase the rate and volume of direct surface run-off. The potential impact of this is a possible increase in surface water run-off along with sediment loading, which could potentially impact local drainage if not adequately mitigated. This increase in the rate and volume of direct surface run-off can result in increased sediment loading, scouring impacts on local drainage and watercourses, and downstream impacts.

There are no groundwater abstractions proposed, therefore no potential impacts on the existing groundwater regime.

There are no proposed permanent diversions of any waterbodies as part of the Proposed Development.

In the absence of mitigation measures the potential impacts during the construction phase on groundwater quantity and flow are **negative, slight and short term**.

Potential Impacts on Water Framework Directive Status

There is a potential of accidental discharges during the construction phase (as set out in Section 7.4.2). However, these are temporary short-lived events that will not impact on the status of the Kilcullen groundwater body (GWB) in the long term. As such the Proposed Development will not cause any significant deterioration or change in groundwater quality status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the third cycle river basin management plan (2022-2027) i.e. Water Action Plan 2025 - A River Basin Management Plan for Ireland.

In the absence of mitigation measures the potential impacts during the construction phase on the Water Framework Directive (WFD) status due to changes to the hydrogeological environment are **negative, slight and short term**.

Potential Impacts on Human Health and Populations

A reduction in soil quality via unmitigated pollutants entering the soil has the potential to lead to negative impacts on human health and populations. Hydrocarbons and petroleum products for example have a risk for humans by inhaling the fumes / dust from contaminated soil. Depending on the type of contaminant and the level of exposure, soil contamination can have serious health implications. No hazardous waste has been identified within the vicinity of the Proposed Development or its surrounding areas.

Given the historical and current use of the land—primarily greenfield—it is unlikely that hazardous waste or soil contamination is present within the site or surrounding areas.

In the absence of mitigation measures the potential impacts during the construction phase on land, soils and geology are **negative, significant and short term**.

7.5.3 Operational Stage

Potential Impacts on Land, Soils and Geology

There will be no requirement for excavation of made ground, subsoil and rock during the operational phase. The majority of the site will be capped by hardstand/building during construction and installation of drainage will minimize the potential for contamination of the aquifer beneath the site during the operational phase.

Therefore, there will be no requirements for mitigations against increased run-off and sediment loading post construction phase of the development.

Therefore, on this basis in the absence of mitigation measures the potential impacts during the operational phase on land, soils and geology due to the potential for contamination of soils are **neutral, imperceptible and long term**.

Potential Impacts on Groundwater Quality

Surface water runoff from roads, car parking, and hardstanding areas, can potentially contain minor levels of contaminants such as hydrocarbons from trafficked areas. The surface water runoff during the operational phase will more likely impact stormwater drainage, rather than directly impact the Kilcullen groundwater body (GWB) underlying the site, due to the hardstand and drainage infrastructure proposed.

The surface water drainage strategy includes the Proposed Development to be served by a SuDS that is to be integrated with the developments landscaping features and is typically to comprise a combination of multiple measures. Any surface water flows from the Proposed Development will be directed to underground attenuation system of the Proposed Development which discharge to the to the existing public sewer.

In the absence of mitigation measures (or design measures) the potential impacts during the operational phase on groundwater quality are **negative, significant** and **short term**.

Potential Impacts on Groundwater Flow and Quality

The proposed incorporation of hardstand area and the use of SuDS design measures will have a minor effect on local recharge to ground and has the potential to result in increased run-off from the site if not adequately mitigated.

However, the impact on the overall groundwater regime will be insignificant considering the site area is underlying by a "Poor" Aquifer (PI), which is relatively unproductive and will have no significant impact groundwater levels.

The design of the Proposed Development and drainage infrastructure proposed will ensure that the run-off rate is restricted to greenfield run-off. The development includes the implementation of SuDS and an underground attenuation system. The design includes for a 100-year plus climate change allowance and discharge surface water to the downstream network at an appropriately determined rate. There are no groundwater abstractions proposed, therefore no potential impacts on the quantity of groundwater.

In the absence of mitigation measures (or design measures) the potential impacts during the operational phase on groundwater flow and quantity are **negative, slight**, and **short-term**.

Potential Impacts on Human Health and Populations

There is no sensitive economic, or historical geology at the site. During the operational phase of the Proposed Development there is no potential for impact on human health and populations due to changes in land, soil, and geology.

Therefore, on this basis in the absence of mitigation measures the potential impacts during the operational phase on human health and populations due to the potential for contamination of soils are **neutral, imperceptible** and **long term**.

7.6 Potential Cumulative Impacts

The cumulative impact of the proposed development with any/all relevant other planned or permitted developments are discussed below.

Existing developments that are already built and in operation contribute to the characterisation of the baseline environment. As such any further environmental impacts that the proposed development may have in addition to these already constructed and operational developments has been assessed in the preceding sections of this chapter.

This section has been prepared with reference to the list of the following relevant permitted developments in the vicinity:

Planning Ref.	Address	Development Proposal	Decision Date
ABP-321765-25 D24A/0484/WEB	Old Dun Leary Road, Cumberland Street, Longford Place and Dun Leary Hill, Dun Laoghaire, Co. Dublin, A96 N208	Construction of a five to eight storey development in 2 blocks and the change of use and refurbishment of existing three-storey 'Dun Leary House' (a protected structure) to provide for 88 residential units, a retail unit and all associated site works.	16/07/2025 Granted Permission
D25A/0073/WEB	Frascati Centre, Frascati Road, Blackrock, Co. Dublin	Subdivision and associated part change of use of Anchor Retail Unit 1 (located over ground and first floor levels) and back of house at second floor level to provide 2 no. units, comprising Unit D2 for Retail use at ground floor level with an overall GFA of 546 sq.m, and Unit D3 for Gym use at first and second floor level, with an overall GFA of 2,348 sq.m;	21st March 2025 Granted Permission
ABP-318088-24 REF8923	Temple Road/Newtown Avenue to junction of Sandycove Avenue	Living Streets: Coastal Mobility Route (Blackrock to Sandycove).	19/11/2024 Is development and is exempted development
ABP-313509-24	Lands across Co. Dublin	BusConnects Belfield/Blackrock to City Centre Core Bus Corridor Scheme.	27/03/2024 Granted permission with conditions
ABP-318247-24 LRD22A/0930	Dalguise House, Monkstown Road, Monkstown, Co. Dublin, A94 D7D1	Large Scale Residential Development (LRD) - permission for 491 no. residential units, a childcare facility, restaurant/café and all associated site development works. Dalguise House is a protected structure - RPS no. 870. A Natura Impact and an EIAR accompanies application.	09/02/2024 Granted with Conditions
PL06D.308900 D19A/0908	Merrion Road/Rock Road (R118), Booterstown, Blackrock	1 no. vehicular access to Merrion Road/Rock Road to serve a new recreational and interpretive centre, open landscaped space, biodiversity proposals, associated site and infrastructural works	05/07/2023 Grant Permission
ABP-314429-23 D21A/0996	Frascati Centre, Frascati Road, Blackrock, Co. Dublin	A Phase 3 residential development of 98 no. apartments and all associated site works.	30/05/2023 Granted permission with revised conditions

Planning Ref.	Address	Development Proposal	Decision Date
ABP-311260-23 D20A/0567	13-15, Rock Hill, Blackrock, Co. Dublin, A94V2NO	Demolition of the existing two-storey building and the construction of a 3-7 storey mixed use building (8 no. 2- bedroom apartments and 1 no. commercial unit)	18/05/2023 Grant Permission with revised conditions.
ABP-314653-22 D22A/0469	Blackrock House (a protected structure RPS No. 234), 28 Newtown Avenue, Blackrock, Co. Dublin (and also Maretimo Gardens East)	The modification, refurbishment and reconfiguration of Blackrock House to provide for a total of 21 no. apartments within Blackrock House, the construction of 2 no. new residential blocks on site to provide for a total of 42 no. units in the overall subject site, landscaped open space, widened footpath on Maretimo Gardens East and all associated services.	24/08/2022 Granted permission & refused permission
ABP-313569-22 D21A/0958	c.0.49 ha site on the former Europa Garage Site, Newtown Avenue, Blackrock, Co. Dublin	The development will consist of the construction of a residential development providing 91 residential units (GFA c.10,829 sq.m including basement) of 1-4 storeys together with residential accommodation in attic floor over (2 units) in two Pavilion style buildings. The apartment units will consist of 49 no. 1-bed units (c.49-61 sq.m), 38 no. 2-bed units (c.66-94 sq.m) and 4 no. 3-bed units (c.96-108 sq.m) all with associated private balconies/terraces to the north/south/east/west elevations.	20/04/2022 Granted Permission
D21A/0413	Carraig Tennis Club, Rockfield Park, Blackrock, Co. Dublin	The installation of 4 no. new 10 metre steel columns and LED floodlights, the replacement of 2 no. existing 8 metre columns with existing floodlights and all associated site works and laying of column foundations and electrical cabling.	29/07/2021 Granted permission
ABP-308946-21	Newtownpark Avenue, Blackrock, Co. Dublin	Demolition of a single storey shed, construction of 140 no. apartments and all associated site works.	15/04/2021 Granted permission with conditions
D20A/0557	Site at Zurich House, Frascati Road, Blackrock, Co. Dublin	The development will consist of an increase in floor area of the existing office building by providing lateral (to the north-east and south-west) and vertical extensions comprising: the lateral extension (from lower ground floor to fourth floor level) by 1,765 sq m and the vertical extension	24th February 2021 Granted Permission

Planning Ref.	Address	Development Proposal	Decision Date
		(provision of a new set back, part fifth floor level) by 620 sq m; replacement of the north-east facade fronting George's Place and partial replacement of all other facades; and internal modifications and reconfigurations. The proposed development will result in an increase in office floor area from 3,790 sq m to 6,175 sq m. The development also includes: the reconfiguration and extension of the existing car park resulting in the provision of 27 No. car parking spaces.	
ABP-308046-20	Frascati Shopping Centre, Frascati Road, Blackrock, Co. Dublin	The proposed development also includes the provision of 57 no. additional apartments, as an extension of the Phase 1 permission, located above the existing / permitted podium car park to the north west of the centre, as a Phase 2 residential development. The subject application therefore relates to a total of 102 no. residential units.	16/12/2020 Grant Permission Grant and Refuse Permission
D20A/0086	Brookfield Terrace, Carysfort Avenue, Blackrock, Co. Dublin	The demolition of the existing warehouse building, construction of a single storey pre delivery inspection workshop with associated wash bay for vehicles, the provision of 66 no. car parking storage spaces, upgrades to existing entrance, a stormtech attenuation tank and all associated site works.	30/06/2020 Granted permission

Table 7.4. Planning applications granted within a 2 km radius of the Proposed Development over the last five years

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area. Multiple developments in the area could potentially be developed concurrently or overlap during the demolition, construction and operational phases. There will be no effects on land, soils, geology and hydrogeology as each development will adhere to their own CEMP and mitigation plan. There is no pathway and connectivity to land, soils and geology to each development.

In the absence of adherence to the CEMP and mitigation plan, the effect on the local and regional environment is likely to be **negative, significant and long-term**.

7.6.1 Demolition Phase

The potential cumulative impacts on the land, soils, geological and hydrogeological environment surrounding the development are minimal due to the demolition works limited to surface-level activities and do not involve any excavation works. As a result, there is minimal impact on the land, soils, geological and hydrogeological environment, and no significant effects on the composition, stability, or fertility of the land. The absence of excavation works also means that there will be no disturbance to the natural soil structure, thus preventing potential soil erosion or compaction and increased run-off rates.

Any developments proposed in the area will have to adhere to their own CEMP and Mitigation plans. There are no pathway connecting the sites in terms of land, soils and geology.

Overall, the surface-level demolition works have a negligible impact on the land, soils, geology and hydrogeological environment, preserving their integrity and minimizing any potential environmental consequences.

The implementation of mitigation measures outlined in Section 7.8.1 will ensure the residual effect on the land, soils, geology and hydrogeology environment during the demolition phase is likely to be **neutral, imperceptible and short-term**.

Following the TII criteria for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

7.6.2 Construction Phase

The potential for impact on land, soils, geology and hydrogeology during construction primarily arises from localised accidental leaks and spills to ground, which could cause contamination of soils and the receiving groundwater drainage. Contractors for the Proposed Development will be contractually required to operate in compliance with a Construction Environmental Management Plan (CEMP) which will include the mitigation measures outlined in this EIA Report. Other developments will also have to incorporate measures to protect soil and groundwater quality in compliance with the European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016). As a result, there will be no cumulative potential for change in soil quality or the natural groundwater regime.

The implementation of mitigation and monitoring measures detailed in this EIA Report as well as the compliance of the above permitted and planned developments with their respective planning conditions, will ensure there will be minimal cumulative potential for change to the soil and water environment during the construction phase of the Proposed Development. The cumulative impact of the Proposed Development in combination with other planned or permitted developments on the land, soils, geological and hydrogeological environment can therefore be considered to be **neutral, imperceptible and short-term**.

Following the TII criteria for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

7.6.3 Operational Phase

Overall, there will be a local change in recharge pattern due to the increase in hardstand from the Proposed Development. However, based on the overall size of the underlying aquifer and measures to protect soil and water quality there will be no overall change on the groundwater body status.

During operation, all developments are required to manage groundwater discharges in accordance with legislative requirements including the European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016). As such, there will be no significant cumulative impact to water quality.

There is no requirement for bulk chemical storage at the proposed development therefore the potential risk to soil quality is low.

The implementation of design and mitigation measures detailed in Section 7.8.3 as well as the compliance of the Proposed Development and permitted development with their respective planning conditions, will ensure there will be minimal cumulative potential effects on the land, soils, geological and hydrogeological environment during the operational phase of the Proposed Development. The residual cumulative impact of the Proposed Development in combination with other planned or permitted developments can therefore be considered to be **neutral, imperceptible and long-term**.

Following the TII criteria (Appendix 7.1) for rating the magnitude and significance of impacts on the geological and hydrogeological attributes, the magnitude of impact is considered **negligible**.

7.7 Do Nothing Scenario

If the proposed development was not to go ahead (i.e. in a Do-Nothing scenario) the baseline environment in terms of land, soils, geology and hydrogeology would remain unchanged as there would be no excavations or construction. Therefore, in a "Do Nothing" scenario there would be a neutral effect on the land, soils, geological and hydrogeological environment at the site. The likelihood in a temporary and short-term basis is the existing natural state of the area would persist, without any alterations or disturbances caused by the development.

However, there are a number of existing permitted developments in the vicinity of the proposed development.

It is likely that in the absence of the proposed development, that a development of a similar nature would be progressed on the site that accords with national and regional policies and therefore the likely significant effects would be similar to this proposal.

7.8 Mitigation Measures

7.8.1 Demolition Stage

To facilitate the development, demolition works were required under the parent permission. The demolition works of the Proposed Development are limited to surface-level activities and do not involve any excavation works. As a result, the impact on the land, soils and hydrogeology is minimal.

The demolition process focused on dismantling and removing structures, buildings and infrastructure to accommodate the new development and facilitation works, without disturbing the underlying soil or altering the landscape. This approach ensured that there were no significant effects on the land's composition, stability, or fertility. The absence of excavation works means that there is no disturbance to the natural soil structure, preventing potential soil erosion or compaction.

In addition, all waste materials were dealt with in accordance with regional and national legislation. Time and resources will be dedicated to ensuring efficient waste management practices and waste arisings will be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate.

Refer to Chapter 15– Waste Management EIA for further information on remaining demolition phase mitigation in terms of off-site reuse, recycle and disposal rates for demolition waste.

7.8.2 Construction Stage

In order to reduce impacts on the land, soils, geological and hydrogeological environment, a number of mitigation measures will be adopted as part of the construction works on site. The measures will address the main activities of potential impact which include:

- Control of soil excavation and export from site;
- Sources of fill and aggregates for the Proposed Development;
- Fuel and chemical handling, transport and storage; and
- Control of water during construction.

Construction & Environmental Management Plan

The main purpose of a CEMP is to provide a mechanism for implementation of the various mitigation and monitoring measures which are described in the EIA Report. The CEMP demonstrates the applicant's commitment to implementing the Proposed Development in such a way as to avoid or minimise the potential environmental effects arising from construction activities. All personnel will be required to understand and implement the requirements of the plan.

Construction works and the proposed mitigation measures outlined in the CEMP are informed by best practice guidance on the prevention of pollution during development projects including but not limited to:

- Construction Industry Research and Information Association (CIRIA), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532);
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016);
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (4th edition), (C741);
- Enterprise Ireland Best Practice Guide, Oil Storage Guidelines (BPGCS005);
- Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites (Eastern Regional Fisheries Board);
- Central Fisheries Board Channels and Challenges – The enhancement of Salmonid Rivers;
- CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors;
- CIRIA C648 Control of Water Pollution from Constructional Sites;
- Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (NRA 2008); and
- Inland Fisheries Ireland (IFI) – A Guideline on Planning for Watercourses in the Urban Environment.

The CEMP will be implemented and adhered to by the construction contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager, Resource Manager and Ecological Clerk of Works, where relevant. All personnel working on the site will be trained in the implementation of the procedures.

The CEMP sets out the proposed procedures and operations to be utilised on the proposed construction site. All mitigation measures outlined here, and within the CEMP will be implemented during the construction phase, as well as any additional measures required pursuant to consent conditions which may be imposed.

During the project planning phase, a comprehensive emergency response plan will be developed by the construction contractor. This plan will outline a well-defined procedure for effectively managing emergencies as they arise. Furthermore, it's imperative to disseminate this emergency protocol to all site personnel during the site induction process. This plan will include for events such as:

- Pollution incidents: These may involve spillages, the malfunction of temporary structures, embankment collapse, acts of vandalism, fires, and other related events.
- Extreme weather occurrences: Events such as heavy rainfall, flooding, are important factors to consider due to their potential impact on the construction process.

The construction contractor will be required to implement emergency response procedures that align with industry best practice guidance. All personnel working on the site will be informed of the emergency procedures in place.

Soil Excavation, Removal and Infill

There will be soil excavated to facilitate construction of foundations and the installation of underground services. The project engineers have estimated that c. 12,000 m³ of material will need to be excavated.

Material that is exported from site, if not correctly managed or handled, could impact negatively on human beings (onsite and offsite) as well as soil environments. All excavated materials will be visually assessed by suitably qualified persons for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. It is predicted that c. 12,000 m³ of soil will be excavated and 1,200 m³ of it will be transported off site.

Contractors should prepare and adhere to a method statement indicating the extent of the areas likely to be affected and demonstrating that this is the minimum disturbance necessary to achieve the required works.

Where weathered bedrock or more competent rock is encountered, appropriate piling and rock excavation techniques will be selected to minimise vibration, ground disturbance and localised disturbance to the geological environment. Where more competent rock is encountered, specialist techniques such as hydraulic splitting may be used, where appropriate, to reduce shocks and vibrations associated with impact breaking. The founding strata should be inspected and verified by a suitably qualified engineer prior to construction of the building foundations.

Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated through the implementation of an appropriate earthworks handling protocol during construction. Any rock arisings generated during piling, coring or excavation works will be appropriately managed, classified and either reused on site where suitable or transported off site to an appropriately authorised facility.

Dust suppression measures (e.g. damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment are free of nuisance dust and dirt on roads. Where groundwater is encountered during piling or excavation works, suitable groundwater control or dewatering measures will be implemented. Piles will be appropriately sealed or grouted where required to avoid creating preferential groundwater pathways.

Sources of Engineering Fill and Aggregates

All imported fill and aggregate that may be required for the Proposed Development will be sourced from reputable suppliers. All suppliers will be vetted for:

- Aggregate compliance certificates/declarations of conformity for the classes of material specified for the Proposed Development;
- Environmental Management status; and
- Regulatory and Legal Compliance status of the Company.

Cement/Concrete Works

Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.

No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within any riparian or buffer zone. Wash-outs will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker or discharged to foul sewer subject to agreement with Uisce Éireann (Irish Water).

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. Relevant personnel working on the site will be suitably trained in the implementation of the procedures.

Hydrocarbons and Other Construction Chemicals

The following mitigation measures will be implemented during the construction phase in order to prevent any spillages to ground of fuels and other construction chemicals and prevent any resulting to and groundwater systems:

- Designation of bunded refuelling areas on the site;
- Provision of spill kit facilities across the site;
- Where mobile fuel bowzers are used, the following measures will be taken:
 - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
 - The pump or valve will be fitted with a lock and will be secured when not in use;

- All bowzers to carry a spill kit and relevant operatives must have spill response training; and
- Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

In the case of drummed fuel or other potentially polluting substances which may be used during the construction phase, the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;
- Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be stored within temporary bunded areas, doubled skinned tanks or bunded containers to a volume of 110% of the capacity of the largest tank/container. Drainage from the bunded area(s) shall be diverted for collection and safe disposal.
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the site, they will be secured and on spill pallets; and
- Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

In addition to the measures above, all excavated materials will be visually assessed by suitably qualified persons for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in designated bunded refuelling areas, which will be away from surface water gulleys or drains. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001) will be complied with.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the site will be suitably trained in the implementation of the procedures.

Fuel and Chemical Handling

The following mitigation measures will be taken at the construction stage in order to prevent any spillages to ground of fuels and prevent any resulting soil and/or groundwater quality impacts:

- Designation of a bunded refuelling areas on the site if refuelling cannot be undertaken off site;
- Provision of spill kit facilities across the site;
- Where mobile fuel bowzers are used, the following measures will be taken:
 - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
 - The pump or valve will be fitted with a lock and will be secured when not in use;
 - All bowzers to carry a spill kit and relevant operatives must have spill response training;

- Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

In the case of drummed fuel or other potentially polluting substances which may be used during construction the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally banded chemical storage cabinet unit or inside some concrete banded area;
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the site, they will be secured and on spill pallets; and
- Drums to be loaded and unloaded by competent and trained personnel using appropriate equipment.

In addition to the measures above, all excavated materials will be visually assessed by suitably qualified persons for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in designated banded refuelling areas, which will be away from surface water gulleys or drains. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001) will be complied with.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

Environmental Procedures

There will be comprehensive emergency response procedures and standard operating procedures to respond to chemical spillage all types. All employees will be provided with such equipment, information, training and supervision as is necessary to implement the emergency response procedures and standard operating procedures.

7.8.3 Operational Stage

Emergency Response Procedures

There should be comprehensive emergency response procedures and standard operating procedures to respond to an onsite fuel spillage. All employees should be provided with such equipment, information, training and supervision as is necessary to implement the emergency response procedures and standard operating procedures.

Fuel Storage

Spill kit facilities should be provided, and operatives should be trained in their use during the operational stage, to manage any potential leaks from fuel storage and vehicles that could otherwise result in impacts on soil and/or groundwater quality.

Groundwater Quality

The design has taken account of the potential impacts of the development on groundwater quality; measures have been incorporated in the design to mitigate these potential impacts.

To mitigate potential contamination from surface water runoff, which may originate from roads and hardstanding areas, a sustainable drainage system (SuDS) will be implemented. This system is designed to minimize the risk of contaminants, such as hydrocarbons, entering the stormwater drainage network and subsequently impacting the Kilcullen groundwater body (GWB) underlying the site.

The surface water drainage strategy integrates various measures, including attenuation tanks, intensive and extensive green roofs, permeable paving and dry swales/infiltration trench. These features will effectively manage surface water flows, directing them to attenuation tanks to maximize their storage potential. Flow control devices will be installed at the outlet pipes of each attenuation storage tanks to ensure that surface water runoff is stored efficiently before entering the receiving environment.

Refer to the Engineering Services Report, prepared by JJ Campbell & Associates submitted separately as part of the planning application for further information on the proposed storm water management and design.

Groundwater Flow and Quality

The proposed incorporation of hardstand areas and SuDS design measures may slightly reduce local groundwater recharge and increase runoff if not properly managed, potentially causing flooding and affecting downstream environments. However, the overall impact on the groundwater regime is expected to be insignificant due to the site's small area relative to the total aquifer, and construction will avoid areas with localized flooding to mitigate flood risks.

To mitigate these risks, the design of the development and its drainage infrastructure will ensure that runoff rates are restricted to those of greenfield conditions. The development will incorporate SuDS and an underground attenuation system, with a design that up to and including the 100-year plus climate change allowance and discharge surface water to the downstream network at an appropriately determined rate. Surface water management and mitigation measure are discussed in further detail in Chapter 8 (Hydrology).

Furthermore, there are no proposed groundwater abstractions, eliminating potential impacts on the quantity of groundwater resources.

7.9 Residual Impacts

7.9.1 Demolition Stage

A carefully planned approach during the remaining demolition phase in particular waste management and full adherence to the RWMP presented in Appendix 15.1 and Chapter 15– Waste Management of the EIAR, will ensure that the predicted effect on the land, soils, geological and hydrogeological environment will be **neutral, imperceptible and short-term**.

Following the TII criteria for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

7.9.2 Construction Stage

Land, Soils, Bedrock and Geology

The implementation of the mitigation measures detailed in Section 7.8.2, will ensure that the potential impacts on land, soils, bedrock and geology during the construction phase are adequately mitigated. The residual effect on the soils and bedrock during the construction phase is considered to be **neutral, imperceptible and short-term**.

Following the TII criteria (refer to Appendix 7.1) for rating the magnitude and significance of impacts on the geological related attributes, the magnitude of impact is considered **negligible**.

Groundwater Quality

The implementation of the mitigation measures detailed in Section 7.8.2, will ensure that the potential impacts on groundwater quality during the construction phase are adequately mitigated. There will be no change to overall flow and quality within the hydrogeological regime as a result of construction.

The residual effect on groundwater quality during the construction phase is considered to be **neutral, imperceptible and short-term**.

Following the TII criteria (refer to Appendix 7.1) for rating the magnitude and significance of impacts on the hydrogeological related attributes, the magnitude of impact is considered **negligible**.

Groundwater Flow and Quantity

The implementation of the mitigation measures detailed in Section 7.8.2, will ensure that the potential impacts on groundwater flow and quantity during the construction phase are adequately mitigated. There will be no change to overall flow and quantity within the hydrogeological regime as a result of construction.

The residual effect on groundwater flow and quantity during the construction phase is considered to be **neutral, imperceptible and short-term**.

Following the TII criteria (refer to Appendix 7.1) for rating the magnitude and significance of impacts on the hydrogeological related attributes, the magnitude of impact is considered **negligible**.

Human Health and Populations

The implementation of the mitigation measures detailed in Section 7.8.2, will ensure that the potential impacts on human health and populations during the construction phase are adequately mitigated.

The residual effect on the soils and bedrock during the construction phase is considered to be **neutral, imperceptible and short-term**.

7.9.3 Operational Stage

Land, Soils and Geology

The implementation of the mitigation measures detailed in Section 7.8.3, will ensure that the potential impacts on land, soils and geology once the Proposed Development is constructed and operational are adequately mitigated. The residual effect on the soils and geology during the operational phase is considered to be **neutral, imperceptible and long-term**.

Following the TII criteria (refer to Appendix 7.1) for rating the magnitude and significance of impacts on the geological related attributes, the magnitude of impact is considered **negligible**.

Groundwater Quality

The implementation of the mitigation measures detailed in Section 7.8.3, will ensure that the potential impacts on groundwater quality once the Proposed Development is constructed and operational are adequately mitigated.

The residual effect on groundwater quality during the operational phase is considered to be **neutral, imperceptible and long-term**.

Following the TII criteria (refer to Appendix 7.1) for rating the magnitude and significance of impacts on the hydrogeological related attributes, the magnitude of impact is considered **negligible**.

Groundwater Flow and Quantity

The implementation of the mitigation and monitoring measures detailed in Section 7.8.3, will ensure that the potential impacts on groundwater flow and quantity once the Proposed Development is constructed and operational are adequately mitigated.

The residual effect on groundwater flow and quantity during the operational phase is considered to be **neutral, imperceptible** and **long-term**.

Following the TII criteria (refer to Appendix 7.1) for rating the magnitude and significance of impacts on the hydrogeological related attributes, the magnitude of impact is considered **negligible**.

Human Health and Populations

The implementation of the mitigation measures detailed in Section 7.8.3, will ensure that the potential impacts on human health and populations once the Proposed Development is constructed and operational are adequately mitigated. The residual effect on human health and populations during the operational phase is considered to be **neutral, imperceptible** and **long-term**.

7.10 Monitoring

7.10.1 Demolition Stage

The remaining demolition works of the Proposed Development are limited to surface-level activities and do not involve any excavation works. The absence of excavation works means that there is no disturbance to the natural soil structure, preventing potential soil erosion or compaction.

In addition, all waste materials will be dealt with in accordance with regional and national legislation. Time and resources will be dedicated to ensuring efficient waste management practices and waste arisings will be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate.

7.10.2 Construction Stage

During construction phase the following monitoring measures will be implemented:

- Regular inspection of water run-off and sediments controls (e.g., silt traps);
- Soil sampling to confirm disposal options for excavated soils to ensure correct disposal;
- Excavation works to be monitored to record any signs of potentially contaminated soil;
- Soil sampling of excavated soils and monitoring of surface water run off will be required in case of accidental discharges to underlying geology; and
- Regular inspection of construction / mitigation measures (i.e., concrete pouring, refuelling, etc) to minimise potential for discharge to ground.

7.10.3 Operational Stage

Maintenance of the surface water drainage system, including interceptors, and foul sewers is recommended to minimise any accidental discharges to the underlying soils and groundwater body.

7.11 Reinstatement

Upon completion of the construction works, all areas temporarily disturbed by the development will be reinstated to their original condition or to a suitable landscaped finish. This will include the replacement of topsoil, regrading of surfaces, and re-vegetation where necessary to ensure soil stability and prevent erosion. Any temporary access routes or storage areas will be removed, and

drainage systems restored to full functionality. All reinstatement works will be carried out in accordance with the Construction Environmental Management Plan (CEMP) and supervised by the site environmental manager to ensure compliance with best environmental practices.

During the operational stage, reinstated areas will be maintained to ensure their long-term stability and integration with the surrounding environment. Regular inspection of landscaped and re-vegetated areas will be carried out to confirm successful establishment of vegetation and to identify any localised erosion, settlement, or drainage issues. Any damaged or degraded surfaces will be repaired. Surface water drainage systems, including interceptors and swales, will be maintained to prevent runoff and potential discharge of pollutants to soil and groundwater body. These measures will ensure the ongoing protection of the reinstated ground and the preservation of soil and groundwater body integrity throughout the operational phase of the residential development.

7.12 Interactions

This section discusses interactions between this chapter and other specialist environmental topics considered in this EIAR.

7.12.1 Air Quality & Climate

Demolition & Construction Stages

Demolition and construction phase activities such as demolition of existing infrastructure, excavations and stockpiling of materials have the potential for interactions between air quality and the land, soils and hydrogeological environment in the form of dust emissions.

Mitigation measures implemented during the demolition and construction phases will ensure that the deposition of dust is minimised. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land, soils and hydrogeology. The interaction is considered to be **neutral, imperceptible, and short term**.

There are no interactions identified between land, soils, hydrogeology and climate during the demolition and construction phases.

Operational Stage

There are no interactions identified between land, soils, hydrogeology, air quality and climate during the operational phase.

7.12.2 Hydrology

Demolition Stage

The likelihood of significant effects on the hydrological regime at the Proposed Development during the demolition phase is minimal due to the demolition works being limited to surface-level activities and do not involve any excavation works.

As a result, no significant effects on the land's composition, stability, or fertility are anticipated. The absence of excavation works means that there is no disturbance to the natural soil structure, preventing potential soil erosion or compaction. Therefore, there is no risk of increased sediment loading and run off entering nearby surface waterbodies during this phase. The interaction is considered to be **neutral, imperceptible and short-term**.

Construction Stage

The construction phase of the Proposed Development has the potential to result in increased sediment runoff which has the potential to interact negatively on surface water quality. The proposed construction phase mitigation outlined in Section 8.8.2 - Chapter 8 – Hydrology of the EIA Report, means that the proposed development will not result in significant negative impact

on surface water quality in the local area. The interaction is considered to be **neutral, imperceptible and short-term**.

Operational Stage

The operational phase of the proposed development has the potential to interact negatively on surface water quality via the proposed surface water network. The proposed operation phase mitigation outlined in Section 8.8.3 - Chapter 8 – Hydrology of the EIAR, means that the proposed development will not result in significant negative impact on surface water quality in the local area. The interaction is considered to be **neutral, imperceptible and long-term**.

7.12.3 Biodiversity

Demolition & Construction Stages

The demolition works of the Proposed Development are limited to surface-level activities on predominately existing buildings and infrastructure and do not involve any excavation works. As a result, the impact on biodiversity is minimal. Overall, the surface-level demolition works will benefit the local biodiversity, preserving their integrity and minimizing any potential environmental consequences. The interaction is considered to be **neutral, imperceptible and short-term**.

Regarding the construction phase, in the absence of standard mitigation measures to control the construction activities there is potential for silt laden material or pollution to enter nearby surface waterbodies (and impact on local biodiversity and European sites downstream from the works). Furthermore, dust emissions from exposed earthworks have the potential to settle on plants causing impacts to local ecology.

Thereby, taking into account the mitigation measures outlined in Section 7.8, there still remains a residual negative interaction between land, soils and hydrogeology with biodiversity during the construction phase. The interaction is considered to be **negative, imperceptible, and short term**.

Operational Phase

The proposed work is expected to have no significant impact on the local designated areas and their conservation objectives. The interaction is considered to be **neutral, imperceptible, and long-term**.

7.12.4 Waste

Demolition & Construction Stages

During the demolition phase, some structures, buildings, and infrastructure will be removed from the site to accommodate the proposed development and associated enabling works. These activities will generate waste materials that will be managed in accordance with regional and national legislation. Time and resources will be dedicated to ensuring efficient waste management practices, and waste arisings will be taken to suitably registered, permitted, and licensed waste facilities for processing and segregation, reuse, recycling, recovery, and/or disposal, as appropriate.

During the construction phase, excavated soil (c. 12,000 m³) will be generated from the excavations required to facilitate site levelling, construction of new foundations and installations of site services. It is currently envisaged that 10,800 m³ of excavated soil will be reused on-site.

The material that will be taken off-site will be sent for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 15 (Waste Management), Chapter 7 (Land, Soils, Geology, Hydrogeology) and the requirements of the RWMP (Appendix 15.1), will ensure the effect is **neutral, imperceptible and long-term**.

Operational Stage

There are no potentially significant interactions identified between land, soils, geology, hydrogeology and waste during the operational phase.

7.13 Difficulties Encountered

There were no difficulties encountered in the preparation of this EIAR chapter.

7.14 References

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