Enviroguide CONSULTING

HYDROLOGICAL AND HYDROGEOLOGICAL ASSESSMENT REPORT

FOR

PROPOSED DEVELOPMENT

AT

GLENSIDE HOUSE, GLASSAMUCKY, BOHERNABREENA, DUBLIN 24

JANUARY 2023

ON BEHALF OF

MR. GARY MC KEON

Prepared by
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DOCUMENT CONTROL SHEET

Client	Mr. Gary Mc Keon
Project Title	Proposed Development at Glenside House, Glassamucky, Bohernabreena, Dublin 24
Document Title	Hydrological and Hydrogeological Assessment Report

Rev.	Status	Author(s)	Reviewed by	Approved by	Issue Date
01	Issue	Gareth Carroll Senior Consultant	Claire Clifford Technical Director	Claire Clifford Technical Director	16/01/2022

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1 INTRODUCTION

Enviroguide Consulting (hereafter referred to as EGC) was appointed by Mr. Gary Mc Keon (hereafter referred to as the Applicant), to prepare a Hydrological and Hydrogeological Assessment (HRA) for the Proposed Development located at Glenside House, Glassamucky, Bohernabreena, Dublin 24 (hereafter referred to as the Proposed Development / Site).

This report presents the findings of a hydrological and hydrogeological assessment undertaken to specifically address Item 2(a) of South Dublin County Council's (hereafter referred to as SDCC) Request for Additional Information (RAI) dated 2nd August 2022, in Relation to Planning Reference SD22A/0266 for the Proposed Development.

1.1. Project Objective and Scope

The overall project objective was to prepare a hydrological and hydrogeological assessment (HRA) to address the issues raised in Item 2(a) of the RAI which states:

> **Item 2 (a)**
>
> *'The Planning Authority cannot screen out Appropriate Assessment for the development due to a lack of information relating to the groundwater connection to the Glenasmole Valley SAC and the petrifying springs (a qualifying interest of the SAC). The applicant is requested to submit a fully comprehensive Hydrological Survey Report and demonstrate the potential impact of chemicals and phosphates which on the petrifying springs in the Glenasmole Valley SAC (Special Area of Conservation), arising from the storage, maintenance and washing of vintage cars on the site. This should be incorporated into a revised AA Screening Report'.*

The scope of the HRA undertaken to meet the project objective is outlined below.

- A desk-based study that comprised:
  - review of published hydrogeological information.
  - review of design information for the Proposed Development provided by the Applicant.
- Develop a Conceptual Site Model (CSM) to describe potential Source-Pathway-Receptor (SPR) linkages for the Site and activities associated the Proposed Development.
- Assess the potential impacts that the Proposed Development and in particular the storage, maintenance and washing of vintage cars on the Site have on the receiving water environment and specifically the Glenasmole Valley SAC.

The scope of work was undertaken in accordance with Environmental Protection Agency (EPA) 'Guidance on the Authorisation of Discharges to Groundwater' (EPA, 2011).

The findings of this report are reliant on the information provided by the Applicant and documents prepared by others as referenced in this report pertaining to the Proposed Development.

An Appropriate Assessment (AA) Screening report (Openfield Ecological Services, 2023 Screening for Appropriate Assessment and Ecology Report (OES, 2023)) is provided under a separate report.

1.2. Professional Competency

This report was written by Gareth Carroll BAI, Senior Environmental Consultant with EGC with over 10 years' experience of environmental assessment of brownfield and greenfield sites. The report was reviewed by Claire Clifford BSc., MSc., PGeo., EurGeol who is Technical Director of the Contaminated Land and Hydrogeology Division of Enviroguide Consulting and is a Professional Geologist listed on the Institute of Geologists of Ireland 'Register of Professional Qualified Geoscientists / Competent Persons: Regulated and Unregulated Waste Disposal/ Contaminated Land Assessments' and has extensive experience in preparing environmental, hydrological and hydrogeological assessments.

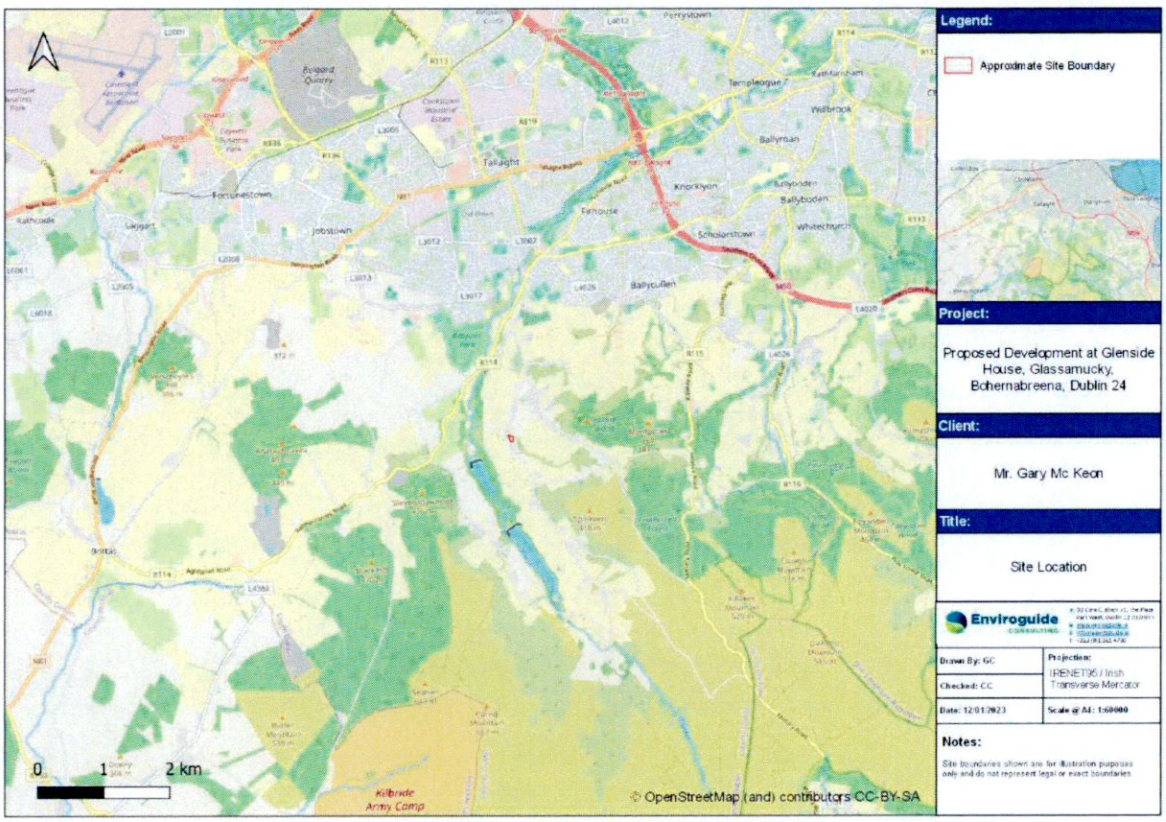
2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Site Location

The Site of the Proposed Development is located at Glenside House, Glassamucky, Bohernabreena, Dublin 24 . The entrance to the Site is located off Glassamucky Road (L7239) along the western boundary of the Site.

The Site location is presented in Figure 2-1 (also included in Appendix B).

Figure 2-1. Site Location Plan



2.2 Site Description and Land Use

The Site of the Proposed Development, which is irregular in plan, is 0.5 hectares (Ha) and comprises the following:

- An existing 1.5 storey detached dormer dwelling (Building A) and a single storey detached garage with single storey rectangular conservatory style extension (Building A1) in the central portion of the Site.
- A small rectangular single storey building (Building B) adjoining eastern boundary of the Site.
- A single storey shed (Building E) and derelict building (Building C) in the southwest corner of the Site.
- A single storey shed (Building F) along the eastern boundary of the Site to the north of Building B.
- Associated driveways, car parking, footpaths and landscaped garden areas.

The Proposed Development Site, which is demarked with fencing, trees and hedgerows is bound to the north / northwest by the Piperstown Stream (River Waterbody Code: IE_EA_09D010100), to the west by Glassamucky Road (L7239), to the east by Corcoran's Bank Road (L7239) and to the south by the existing chalet (Building D).

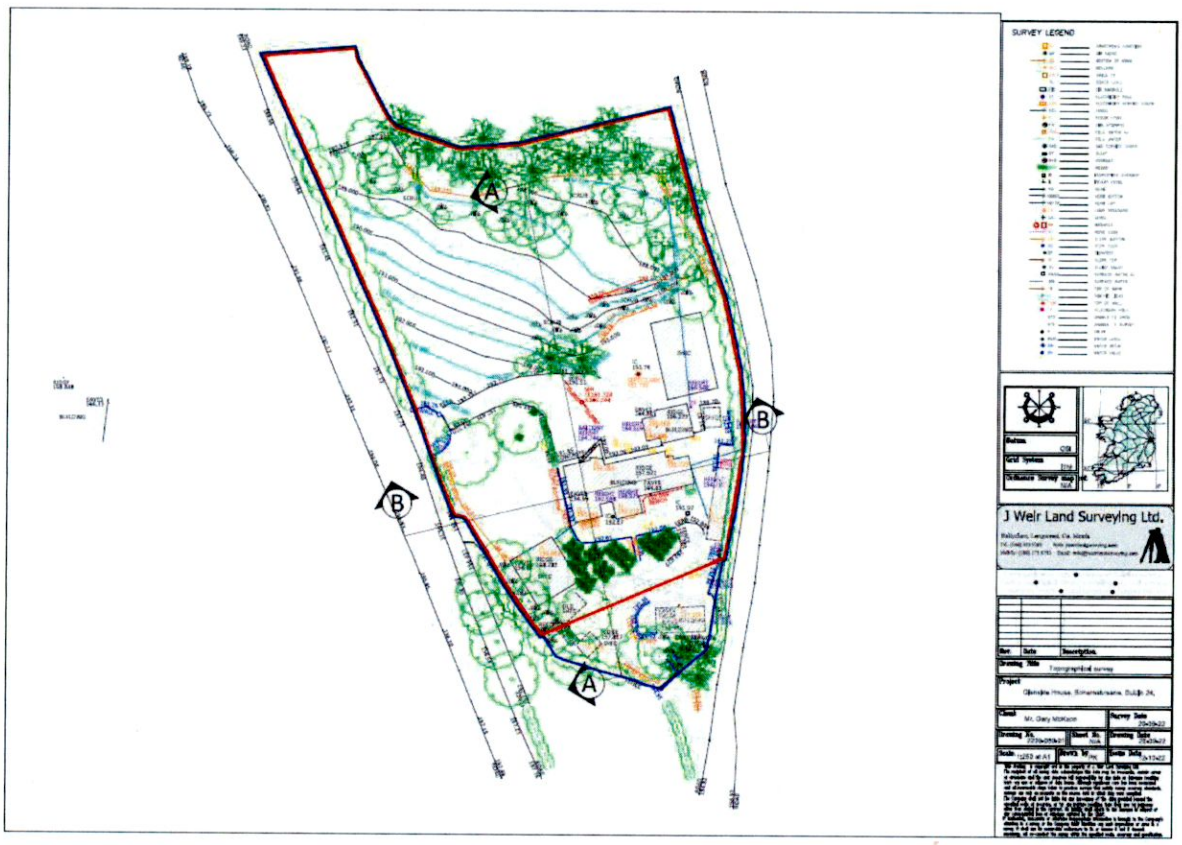
EGC understands from information provided by the Applicant that there are two (2No.) existing septic tanks discharging into a single (1No.) percolation area identified on the Site.

There is an existing chalet (Building D) located immediately south of the Site boundary on lands within the ownership of the Applicant (refer to blue line boundary in Figure 2-2).

The Site is located within a rural setting with surrounding land uses of agriculture and one-off residential dwellings.

The existing Site layout depicting the Site boundary (red line) and the overall landholding of the Applicant (blue line) is presented in Figure 2-2 (source reference: J Weir Land Surveying Ltd., 2022. Topographical Survey – Drawing No. 2209-089-01; also included in Appendix A).

Figure 2-2. Existing Site Layout

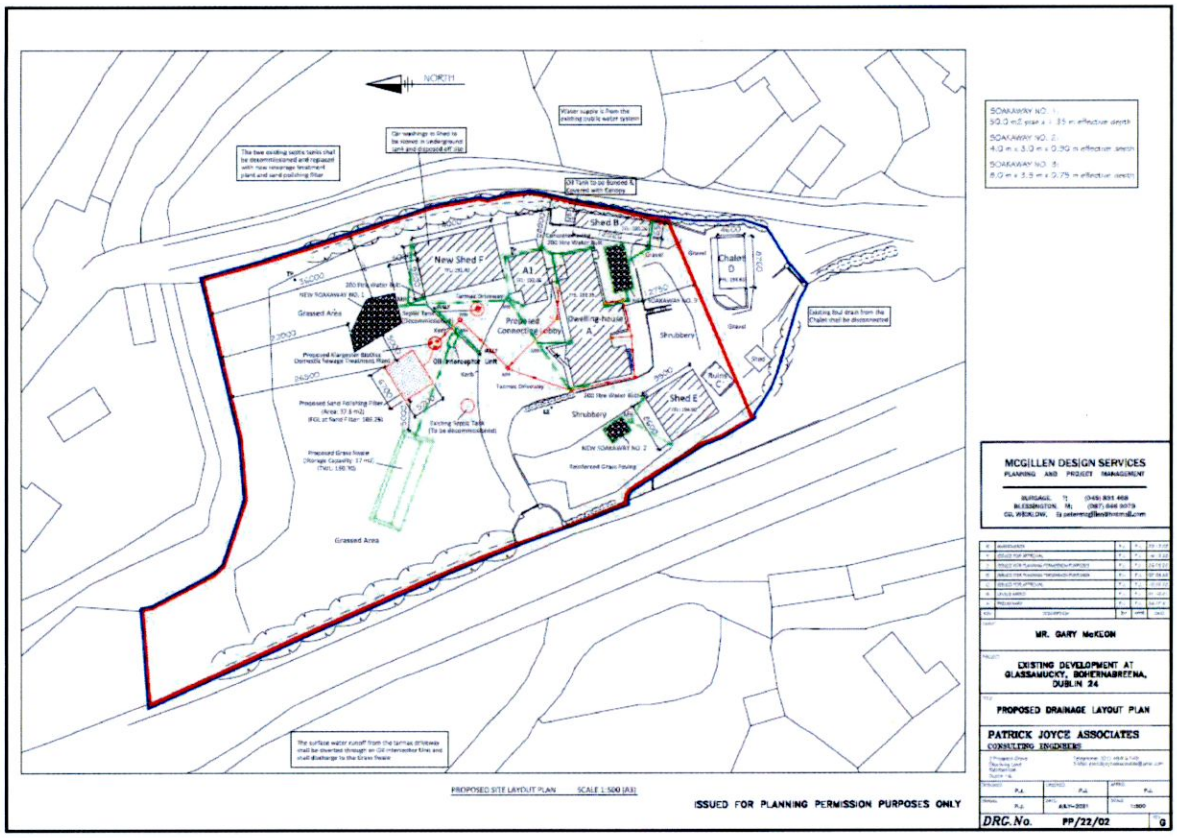


2.3 Relevant Characteristics of the Proposed Development

The Applicant is seeking planning permission from SDCC for the Proposed Development that comprises the retention and completion of existing buildings A, A1, B, E and F, the installation of a dedicated drainage system and impermeable underground storage tank within Building F, the installation of the proposed surface water drainage, the installation of the proposed onsite wastewater treatment system (OSWTS) and completion of all ancillary works in relation to the Proposed Development.

The Site layout plan depicting the overall design of the Proposed Development including the location of existing buildings A through E, the proposed surface water drainage (green lines) and the proposed foul water drainage (red lines) is presented in Figure 2-3 (source reference: Mc Gillen Design Services, 2022. Proposed Drainage Layout Plan – DRG No. PP/22/02; also included in Appendix A).

Figure 2-3. Proposed Development Site Layout



2.3.1 Wash Water from the Storage, Maintenance and Washing of Vintage Cars

As documented in the surface water drainage report (Patrick Joyce Associates (PJA), 2023a), it is proposed that that Building F will be used for the storage, maintenance and washing of vintage cars owned by the Applicant, there will be no storage, washing or maintenance of cars outside of Building F. All wash water, which may contain trace levels of chemicals and phosphates, and other runoff (e.g., oil or fuel drips from cars during storage and maintenance) from within Building F will be collected and fully contained within an impermeable underground storage tank for removal and disposal offsite in accordance with all relevant waste management legislation. The underground storage tank will be EN 12566-3:2017 & SR66:2015 certified and will be fitted with a float switch and high-level alarm (PJA, 2023a).

2.3.2 Surface Water Drainage

EGC understands that surface water runoff from the existing buildings onsite currently discharges to ground via various stone filled soakaways located across the Site, which will be decommissioned as part of the Proposed Development.

As documented in the surface water drainage report (PJA, 2023a), it is proposed that surface water from paved areas and roofs at the Site will be managed as follows (also refer to Figure 2-3):

- Surface water runoff from roofs of Buildings A and A1 (204m^2) and Building F (133m^2) and runoff from concreted footpaths (50m^2) will be discharged to ground via Soakaway No.1.
- Surface water runoff from roof of Building E (85m^2) will be discharged to ground via Soakaway No.2.
- Surface water runoff from roofs of the remaining part of Building A (38m^2) and Building B (37m^2) and runoff from the remaining concreted footpaths (52m^2) will be discharged to ground via Soakaway No.3.
- Surface water runoff from the existing tarmac driveway (300m^2) together with the proposed tarmac surface to the west of Building F (110m^2) will be discharged to ground via a new appropriately sized Class 1 By-Pass Petrol / Oil Interceptor and appropriately sized grass swale.
- All soakaways will be designed and constructed in accordance with Building Research Establishment (BRE) Digest 365 (BRE, 2016. Digest 365 Soakaway Design (PJA, 2023a).
- Sustainable Drainage Systems (SuDS) measures will be incorporated where appropriate and include reinforced grass permeable paving, three (3No.) 200 litre water butts for rainwater recycling and a grass swale to minimise the impact of the runoff on water quality and quantity and maximise the amenity and biodiversity opportunities within the Proposed Development.

There will be no storage of any fuels or chemicals associated with the storage, washing and maintenance of cars in the external yard or garden areas of the Site. The only external storage of fuel will be the existing kerosene home heating fuel above ground storage tank (AST) which will remain in place adjacent the northern elevation of Building B (refer to Figure 2-3). It is proposed that the tank will be bunded and covered with a canopy to prevent rainfall on the tank as part of the Proposed Development works (PJA, 2023b). The bund will be constructed to comply with with BS EN 1992-3 and BS EN 1992-1-1+ A1. In accordance with best practice guidelines (EPA, 2013 IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities) the bund will have a volume of at least 110% of the volume of the stored materials. Therefore, there will be no runoff from any high-risk areas to the surface water drainage.

2.3.3 Foul Wastewater Drainage

There are two (2No.) existing septic tanks identified on the Site (refer to Figure 2-3), which will be decommissioned, and all associated pipework disconnected / removed as part of the Proposed Development.

As documented in the wastewater treatment system report (PJA, 2023b), it is proposed that foul water at the Site will be managed via the new OSWTS designed in accordance with EPA, 2021 CoP. The specification of the proposed OWSTS is designed for a maximum hydraulic loading of 1.2m^3/day and an organic loading of 6PE (Population Equivalent) and is summarised below:

- 6PE Klargester BioDisc® Domestic Sewage Treatment Plant with primary and secondary treatment in a single packaged system; and

- Tertiary treatment will be provided by a sand polishing filter designed and constructed in accordance with the EPA, 2021 CoP.

The proposed OSWTS and tertiary sand polishing filter will treat the wastewater to a minimum operational standard of 5.0mg/l ammonia, 10.0mg/l BOD and 15.0mg/l suspended solids (PJA, 2023b). This treated effluent is of higher quality than the minimum performance standards of 20mg/l ammonia, 20.0mg/l BOD, 30.0mg/L suspended solids as specified in the EPA, 2021 CoP. Effluent will be further treated and with additional attenuation within the tertiary sand polishing filter and the underlying unsaturated zone prior to the treated effluent entering groundwater.

2.3.4 Water Supply

Water supply to the Proposed Development will continue to be from the existing connection to mains IW water supply.

3 ENVIRONMENTAL AND HYDROGEOLOGICAL SITE SETTING

3.1 Topography

The topography of the Site slopes to the east and northeast with elevations ranging from approximately 195.0 meters above Ordnance Datum (mOD) in the southwest corner to 187.5mOD along the northern boundary of the Site (refer to Figure 2-2).

The regional topography in the surrounding area slopes to the northeast and east toward the Dodder River (River Waterbody Code: IE_EA_09D010100) and the Glenasmole Lower Lake (EU Code: IE_EA_09_68) located approximately 0.52km west and southwest of the Site at their closest point respectively and with elevations ranging from approximately 150.0mOD to 120mOD (GSI, 2022).

3.2 Soil and Quaternary Deposits

The soils beneath the Site are mapped by the GSI (GSI, 2023) as deep well drained mineral (mainly acidic) (AminDW) sandstone and shale till (Lower Palaeozoic) derived from mainly non-calcareous parent materials. The soils beneath the Proposed Development Site are presented in Figure 3-1.

The quaternary sediments beneath the majority of the Site are mapped by the GSI (GSI, 2023) as till derived from Metamorphic rocks (TMp). While the quaternary sediments beneath the northwest corner of the Site are mapped by the GSI (GSI, 2023) as till derived from Lower Palaeozoic sandstones and shales. The underlying quaternary soils are presented in Figure 3-2.

The soils identified at the Site during the trial pit excavation as part of the Site characterisation assessment (PJA, 2023b) comprised of brown, topsoil to 0.3 meters below ground level (mbGL) overlying light brown sandy Clay to 1.0mbGL and dark brown silty Clay to the extent of excavation at 2.3mbGL.

Figure 3-1. Soils

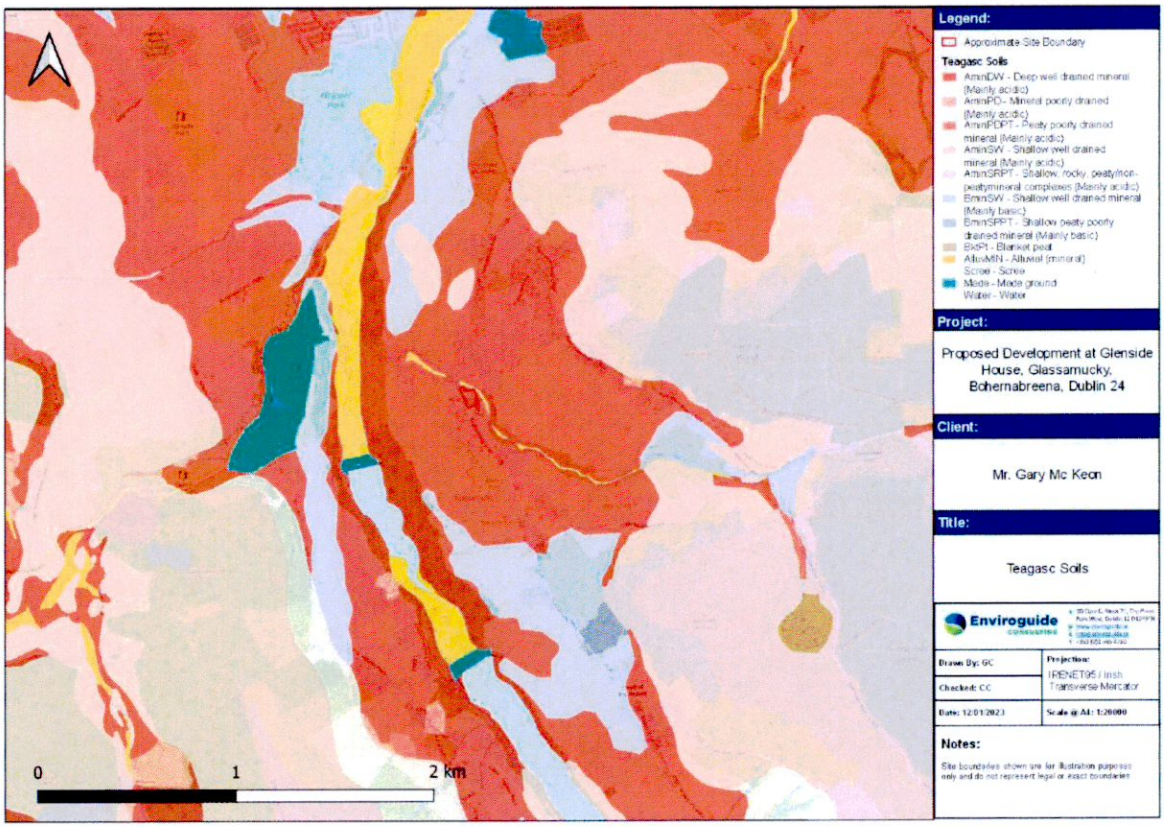
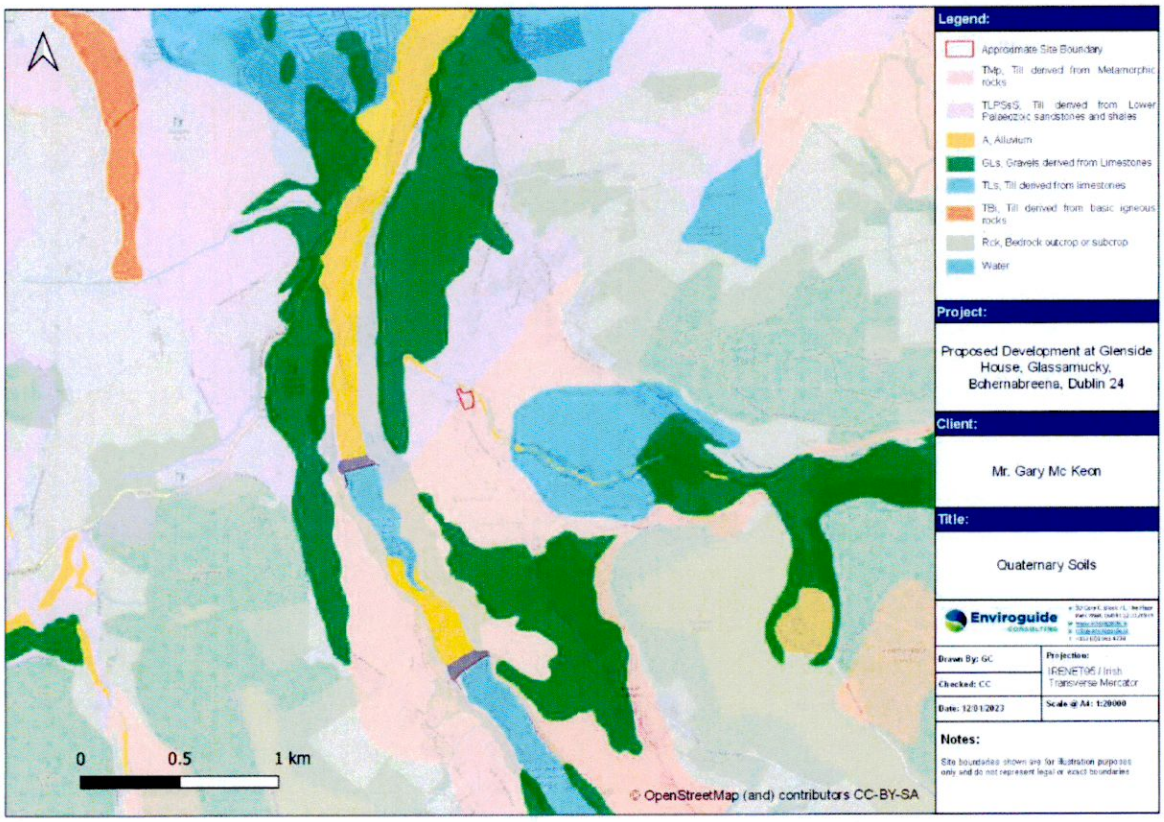


Figure 3-2. Quaternary Soils



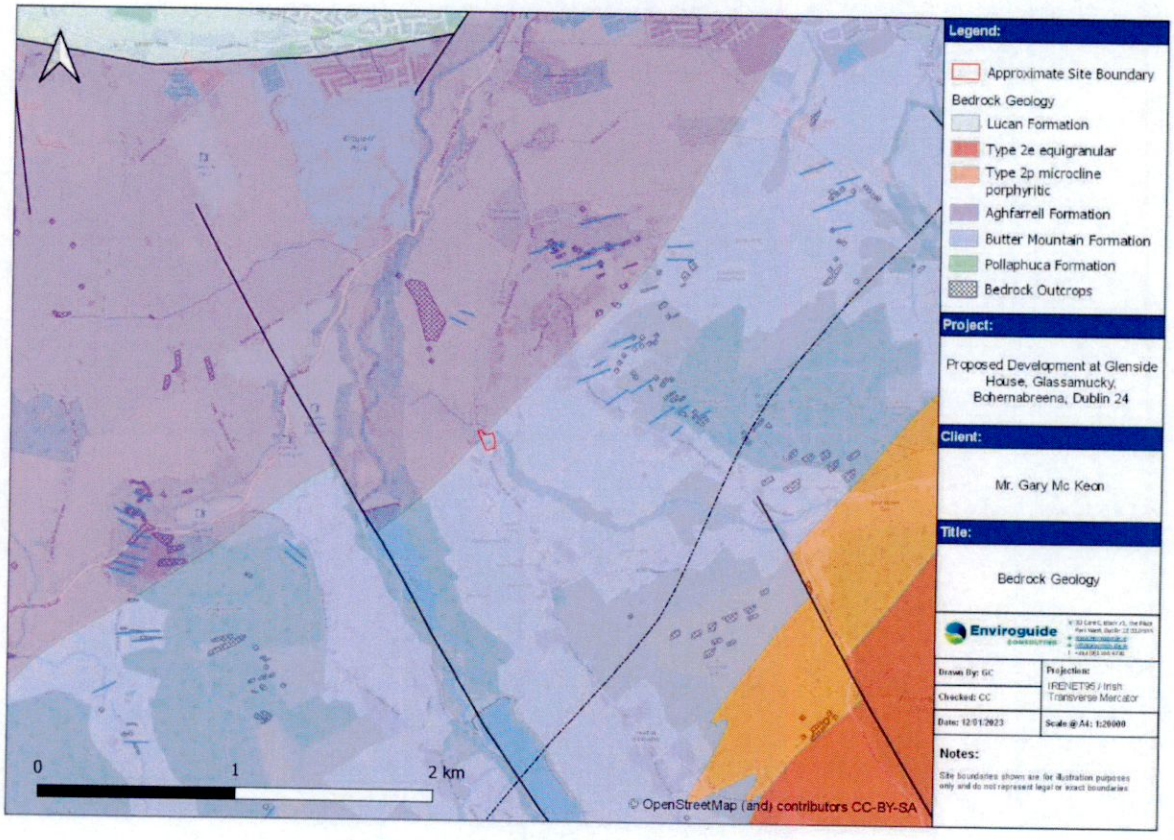
3.3 Bedrock Geology

The GSI database (GSI, 2023) has mapped the bedrock beneath the majority of the Site as the Butter Mountain Formation (New Code: OABUTT) which is described as 'dark slate-schist, quartzite & coticule'. While the bedrock beneath the northwest corner of the Site is mapped by the GSI (GSI, 2023) as the Aghfarrell Formation (New Code: OAAGHF) which comprises thinly-bedded greywacke siltstones and slates deposited by turbidity currents.

There are no bedrock outcrops identified within the Site itself, however there are a number of outcrops identified within a 2km radius of the Site, the closest of which is located approximately 0.44km northwest of the Site. The Bedrock Geology is presented in Figure 3-3.

Bedrock was not encountered during the trial pit excavation at the Site (PJA, 2023b).

Figure 3-3. Bedrock Geology



3.4 Hydrology

3.4.1 Local Surface Water Features

The Site is mapped by the EPA (EPA, 2023) as within the WFD Catchment of the Liffey and Dublin Bay (Catchment I.D.: 09), the Dodder_SC_010 Sub-catchment, (Sub-catchment ID: 09_16) and the Dodder_020 WFD River Sub Basin (EU Code: IE_EA_09D010100).

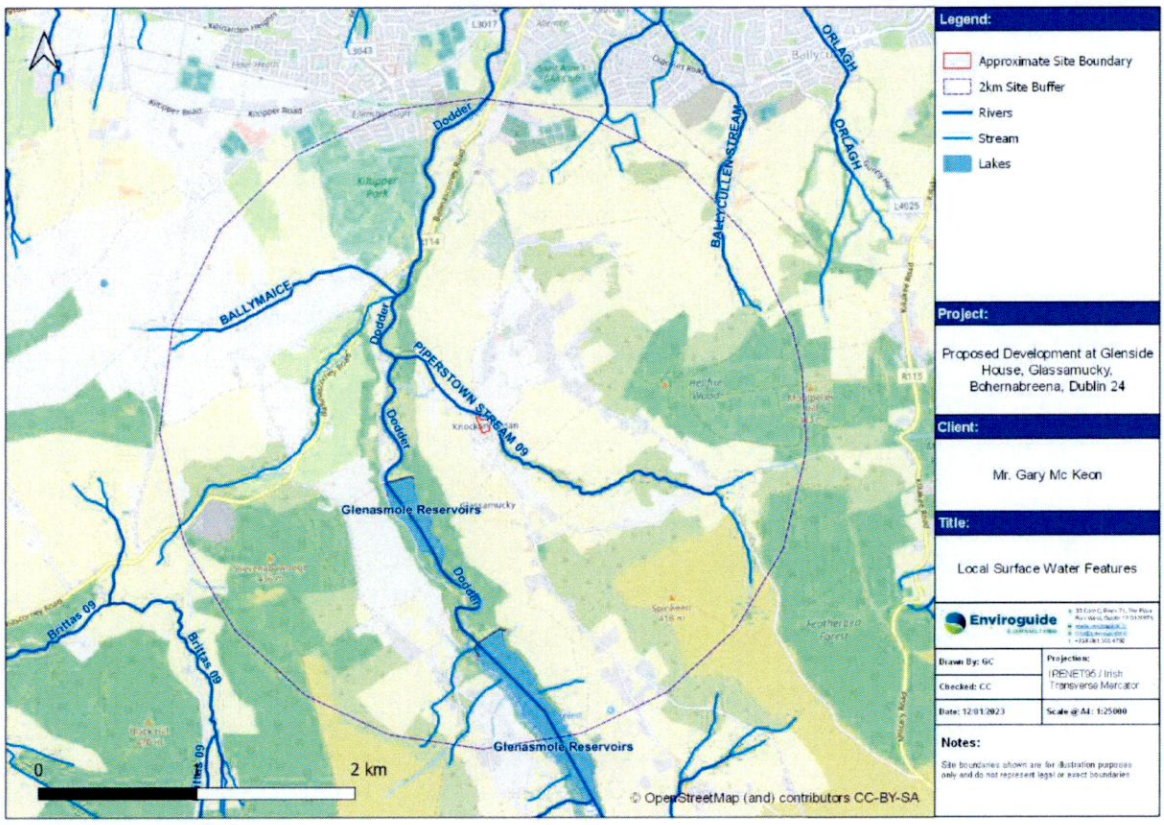
The nearest surface water feature to the Site is recorded on the EPA database (EPA, 2023) as the Piperstown Stream (River Waterbody Code: IE_EA_09D010100) which adjoins the north / northwest boundary of the Site. The Piperstown Stream flows northwest before converging with the Dodder River (River Waterbody Code: IE_EA_09D010100)

approximately 0.66km downstream of the Site and approximately 0.52km west of the Site at its closest point. The Dodder River flows northwest before converging with the Liffey Estuary Lower (EU Code: IE_EA_090_0300) approximately 17.5km downstream. The Liffey Estuary Lower flows east before discharging to Dublin Bay (EU Code: IE_EA_090_0000) approximately 5.95km downstream.

The Glenasmole Lower Lake (EU Code: IE_EA_09_68) is located approximately 0.52km southwest of the Site at its closest point, and the Glenasmole Upper Lake(EU Code: IE_EA_09_70) is located approximately 1.25km southwest of the Site at its closest point. These are located on the Dodder River upstream of the Site and approximately 0.65km and 2.07km upstream of the point of convergence of the Dodder River with the Piperstown Stream respectively.

The local surface water features in the vicinity of the Site are presented in Figure 3-4.

Figure 3-4. Local Surface Water Features



3.4.2 Existing Surface Water Drainage

EGC understands that surface water runoff from the existing buildings onsite discharge to ground via various stone filled soakaways located across the Site. These will be made redundant following construction of the new surface water drainage at the Site.

3.4.3 Surface Water Quality

The EPA Q-Value is a system of water quality rating based on the biological quality of the water body and abundance for specific invertebrate species. A summary of the Q-value for the relevant operational and historic EPA monitoring station located upstream and

downstream of the Site along the Dodder River is presented in Table 4-1. The EPA data indicates that there is an upward trend in total ammonia, total oxidised nitrogen (as N) and ortho-phosphate (as P) for the Dodder River for the period 2013-2018 (EPA, 2023).

Table 4-1: Relevant EPA Monitoring Stations Upstream and Downstream of the Site

River I.D.	Sample Location / Monitoring Station	Q-Value (WFD Status)
Dodder River (3.63km upstream)	Dodder - 1.3 km u/s Reservoir u/s distributary Station I.D.: RS09D010010	4-5 (High) in 2022
Dodder River (0.64km upstream)	U/s Piperstown St Station ID: RS09D010100	4 (Good) in 2022
Dodder River (1.09km downstream)	Dodder - Fort Br Station I.D.: RS09D010200	4-5 (High) in 1991
Dodder River (2.89km downstream)	Old Bawn Br Station I.D.: RS09D010300	4 (Good) in 2022

3.5 Hydrogeology

3.5.1 Groundwater Flow Regimes

The bedrock aquifer beneath the Site is mapped within the Kilcullen Groundwater Body (GWB) (EU Code: IE_EA_G_003). The Lusk-Bog of the Ring GWB covers some 642km^2 and occupies an area across Co. Wicklow, Co. Kildare and Co. Dublin (GSI, 2023).

The main recharge process in this area will be diffuse recharge from water percolating through the overlying tills and into the aquifer Given that the majority of the bedrock across the GWB are considered to be poor aquifers with a low storativity to accept water, overland runoff to streams will be higher (GSI, 2023).

Local groundwater flow is expected to be towards the closest discharge points such rivers and streams (GSI, 2023). Typical groundwater flow paths will be in the order of a couple of hundred metres, with discharge occurring to the closest surface water feature (GSI, 2023). Therefore, , taking account of the hydrogeology of the GWB and the local topography groundwater flow beneath the Site is expected to be to the north / northwest toward the Piperstown Stream which adjoins the north / northwest boundary of the Site.

3.5.2 Groundwater Use and Source Protection

A search of the GSI groundwater well database was conducted to identify registered wells and groundwater sources in the surrounding area. There are no groundwater sources recorded at the Site or within 2km radius of the Site (GSI, 2023).

Historical maps available from the Ordnance Survey of Ireland website (OSI, 2023) identify a well of unknown approximately 0.075km southeast and upgradient of the Site on the 1888 and 1913 maps. This well is not mapped on the GSI database (GSI, 2023) and as it is located upgradient of the Site is not considered in further.

The Site and residential properties in the surrounding area are supplied by connection to Irish Water mains supply and the Proposed Development will continue to be supplied by the existing Irish Water supply.

There are no Groundwater Source Protection Areas (SPAs) within 2km of the Site (GSI, 2023).

3.5.3 Aquifer Classification and Vulnerability

The GSI (GSI, 2023) has classified the bedrock of the Butter Mountain Formation beneath the majority of the Site as a locally important aquifer (LI) which is moderately productive only in local zones. While the bedrock of the Aghfarrell Formation beneath the northwest corner of the Site and areas downgradient of the Site are mapped by the GSI (GSI, 2023) as a poor aquifer (PI) which is generally unproductive except for local zones.

There are no gravel aquifers identified at or within a 2.0km radius of the Site.

The GSI (GSI, 2023) has assigned the aquifer beneath the Site a groundwater in vulnerability rating of "High" (H).

The aquifer classification and groundwater vulnerability rating are presented in Figure 3-5 and Figure 3-6 respectively.

Figure 3-5. Bedrock Aquifer

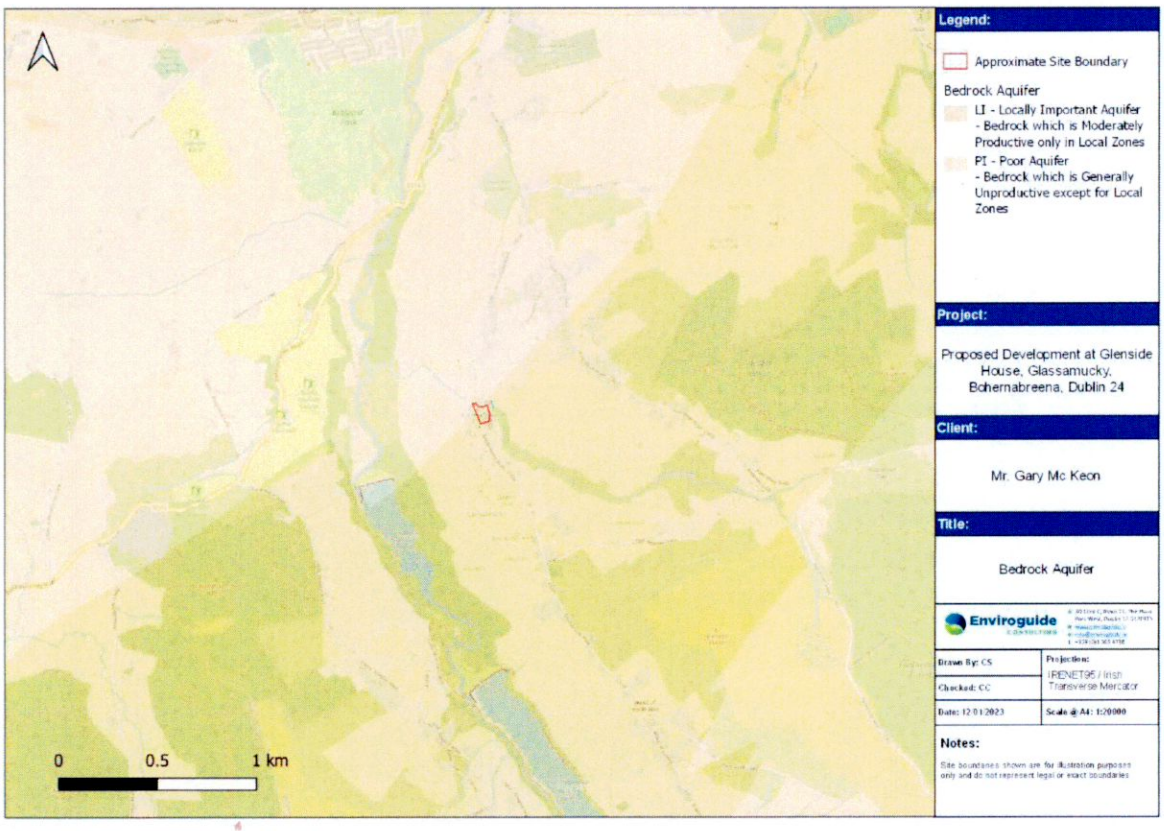
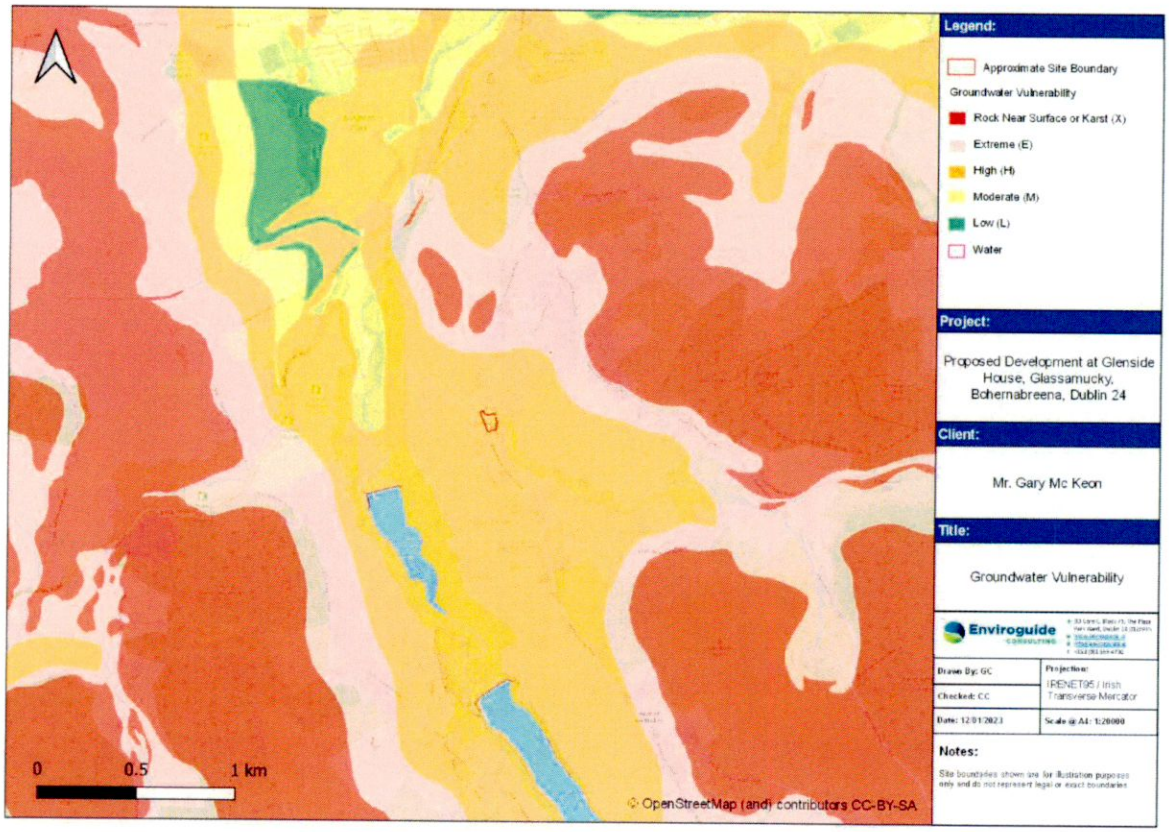


Figure 3-6. Groundwater Vulnerability



3.5.4 Groundwater Protection Response

The GSI guidance document on Groundwater Response Matrix for One Off Housing Wastewater (GSI, 2000), which is based on the Groundwater Protection Schemes report (DEHLG/EPA/GSI, 1999) outlines the response matrix of appropriate groundwater protection responses for potentially polluting activities in a groundwater protection zone. The level of response depends on the aquifer classification, groundwater vulnerability and the potential contaminant loading as outlined in Table 3-2.

Table 3-2. Groundwater Response Matrix (Source: GSI, 2000)

Vulnerability Rating	Source Protection Area		Resource Protection Aquifer Category					
			Regionally Important		Locally Important		Poor Aquifers	
	Inner (SI)	Outer (SO)	Rk	Rf / Rg	Lm / Lg	Ll	Pl	Pu
Extreme (E)	R3[2]	R3[1]	R2[2]	R2[2]	R2[2]	R2[2]	R2[2]	R2[2]
High (H)	R2[4]	R2[3]	R2[1]	R1	R1	R1	R1	R1
Moderate (M)	R2[4]	R2[3]	R1	R1	R1	R1	R1	R1
Low (L)	R2[4]	R1	R1	R1	R1	R1	R1	R1

Based on a groundwater vulnerability rating of High (H) and given that the GSI (GSI, 2023) has classified the bedrock beneath the Site as a locally important aquifer (Ll) the groundwater protection response for the Site is identified as follows:

- R1 - Acceptable subject to normal good practice (i.e., system selection, construction, operation and maintenance in accordance with EPA, 2000.

3.5.5 Groundwater Quality

There is no available published groundwater quality data for the Kilcullen GWB in the vicinity of the Site.

3.6 Designated and Protected Areas

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs). SACs and SPAs are collectively known as Natura 2000 or European sites (referred to hereafter as Natura 2000 site).

As documented in the AA screening report (OES, 2023) the designated and protected areas that are considered relevant to the Site include the following:

- The Glenasmole Valley SAC (Site Code: 1209) located approximately 0.4km west of the Site at its closest point (refer to Figure 3-7);
- The Wicklow Mountains SAC (Site Code: 002122) located approximately1.8km southwest of the Site at its closest point; and
- The Wicklow Mountains Special Area of Protection (SPA) (Site Code 004040) located approximately 4.0km south of the Site at its closest point.

There is no hydraulic connection between the Site and the and the Wicklow Mountains SAC / SPA.

There is an identified potential hydraulic connection with the Glenasmole Valley SAC. The qualifying interests of the Glenasmole Valley SAC include the following:

- Orchid rich grassland/Calcareous grassland;
- Molinea meadows; and
- Petrifying springs (priority habitat).

The known locations of the petrifying springs habitat of the Glenasmole Valley SAC (refer to Figure 3-7) are located west and cross-gradient of groundwater flow from the Site and are mapped upstream of where the Piperstown Stream discharges to the Dodder River.

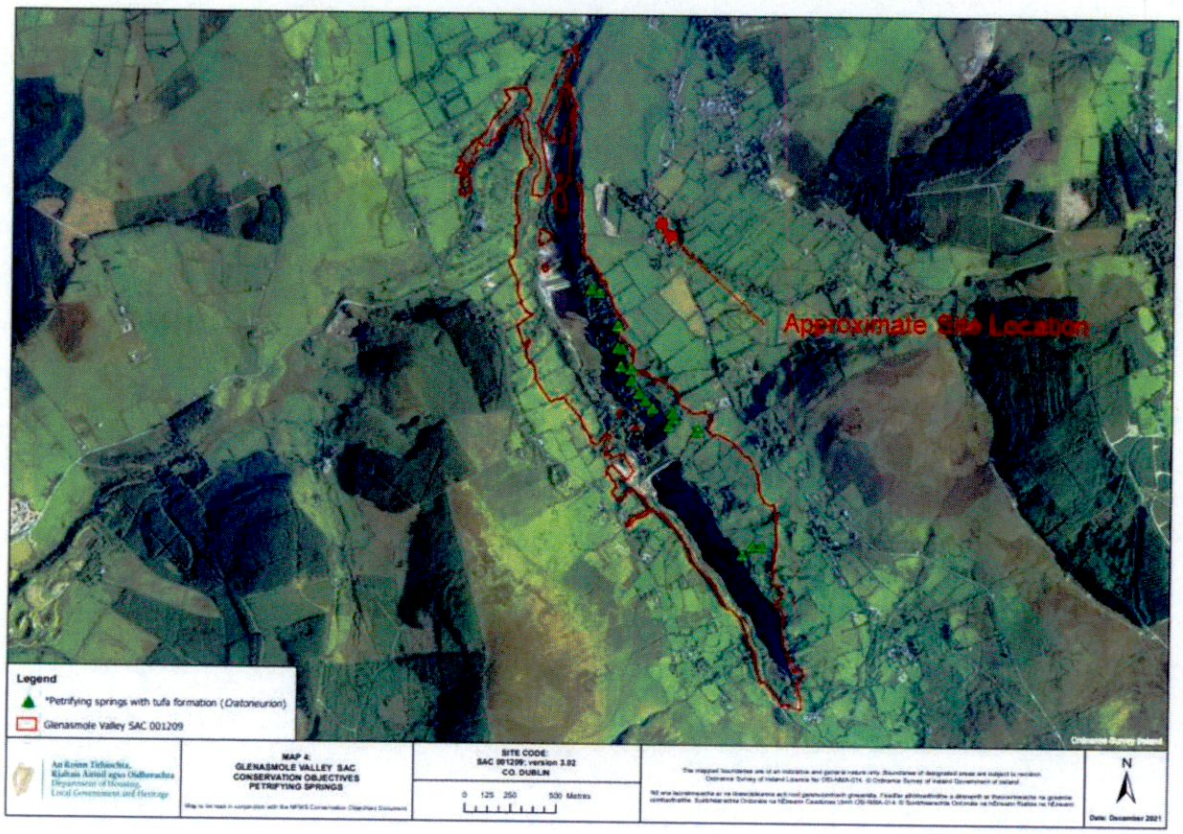
It is noted that the National Park and Wildlife Services database (NPWS, 2023) has mapped other Natura 2000 sites located downstream of the Site and the Dodder River including:

- South Dublin Bay SAC (Site Code: 000210)
- South Dublin Bay and River Tolka Estuary SPA (Site Code: 004024)
- North Dublin Bay SAC (Site Code: 000206)
- North Bull Island SPA (Site Code: 004006)
- Rockabill to Dalkey Island SAC (Site Code: 003000)

These potentially hydraulically connected Natura 2000 sites are located at the closest point more than 20.5km downstream of where the Piperstown Stream discharges to the Dodder River. Therefore, the primary or closest hydraulically connected Natura 2000 site is the Glenasmole Valley SAC which is considered as the most sensitive Natura 2000 site for the

purposes of this assessment of potential impacts associated with the Proposed Development Site.

Figure 3-7. Glenasmole Valley SAC Petrifying Springs (NPWS, 2021. Conservation Objectives Series – Glenasmole Valley SAC 001209)



4 HYDROLOGICAL AND HYDROGEOLOGICAL ASSESSMENT

The basis for this hydrological and hydrogeological risk assessment is the Conceptual Site Model (CSM) or source-pathway-receptor (SPR) model which underpins the Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy with amendments 2455/2001/EC, 2008/32/EC and 2008/105/EC (Water Framework Directive EU, WFD) on which Irish surface water and groundwater regulations are based. The CSM framework is also used in EPA guidelines on the assessment and protection of groundwater and surface water resources and associated aquatic ecosystems.

The 'prevent or limit' objective is the key element of the WFD and in principle, 'prevent or limit' measures are the first line of defence in restricting inputs of pollutants from any Site or activity (i.e., 'source' removal) and thereby avoiding or reducing any potential impact to the receiving water environment.

In this assessment all three elements (SPR) of the CSM will be considered and any potential linkages evaluated and assessed to determine if the Proposed Development could potentially impact upon any identified receptors. These three essential elements (SPR) of the CSM are described as:

- A **source** – a substance that is in, on or under the land and has the potential to cause harm or pollution;
- A **pathway** – a transport route or means by which a receptor can be exposed to, or affected by, a contaminant source; and,
- A **receptor** – in general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property, or a water body.

The term pollutant linkage is used to describe a particular combination of source-pathway-receptor. Each of these elements can exist independently, but they create a risk only where they are linked together so that a particular contaminant affects a particular receptor through a particular pathway (i.e., a pollutant linkage).

The CSM for the Proposed Development is outlined in Section 4.1 and summarised in Table 4-1.

4.1 Conceptual Site Model

4.1.1 Source

The key potential source of contamination associated with the Proposed Development is described as follows:

- Wash water from the storage, maintenance and washing of vehicles which may contain trace levels of chemicals and phosphates. The wash water will be collected within Building F and stored in an impermeable tank for compliant offsite disposal.

Other potential sources include:

- Potential sources of contamination associated with construction works including runoff with entrained suspended solids or other contaminants.

- Discharge to ground of clean surface water runoff from the roofs of buildings across the Site will not contain any deleterious materials and is therefore not a source of contamination.
- Discharge to ground of surface water runoff from paved areas of the Site which may contain trace levels of entrained contaminants (i.e., sediment and petroleum hydrocarbons) will be treated via the Class 1 By-Pass Petrol / Oil Interceptor and swale, regardless this is not considered a significant source.
- Discharge to ground of treated effluent from the proposed OSWTS which will contain low levels of potential contaminants including microbial bacteria, suspended solids, ammoniacal nitrogen and BOD. There are no identified sources associated with the OSWTS which is designed in compliance with the EPA 2021 CoP.
- Storage of heating oil within the existing AST at the Site will be bunded in accordance with the with best practice guidelines (EPA, 2013 IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities) and therefore there is no identified potential source.
- A worst-case scenario, in the in the event of a failure of the Class 1 By-Pass Petrol / Oil Interceptor or a diffuse discharge or wash water from Building F to ground is considered, however based on the embedded design measures this scenario is considered unlikely.
- It is considered that the Proposed Development which will include the decommissioning of the existing septic tanks and soakaways will result in a removal of potential existing contaminant sources.

4.1.2 Pathways

The key potential pathways associated with the sources identified for the Proposed Development include:

- Surface water migration via drainage channels / water courses:
  - There are no direct surface connections from the Site to the closest surface water receptors (i.e., the Piperstown Stream).
- Surface water migration via diffuse surface runoff:
  - All surface water runoff from the Site will be collected within the proposed surface water drainage and discharged to ground.
- Vertical Migration of discharges from the Site to groundwater within the underlying bedrock aquifers of the Butter Mountain Formation and the Aghfarrell Formation.
  - A 'high' (H) groundwater vulnerability rating has been assigned to the aquifer beneath the Site.
  - Rainfall on existing grassed areas will continue percolate to ground.
- Lateral Migration within the aquifer to downgradient receiving surface water and groundwater receptors.
  - Locally groundwater flow beneath the Site is expected to be to the north / northwest toward the Piperstown Stream.

4.1.3 Receptors

The key hydrological receptors considered in this assessment include the following:

- Groundwater

- The locally important (LI) aquifer of the of the Butter Mountain Formation and the poor (PI) aquifer of the Aghfarrell Formation beneath the Site are Part of the Kilcullen GWB.
- There are no identified downgradient groundwater supply users and mains water supply is available in the area.

- Surface Water
  - The Piperstown Stream.
  - The Dodder River.
  - The Glenasmole Lakes are located upgradient of the Site upstream of where the Piperstown Stream discharges to the Dodder River. Therefore, there is no identified hydraulic connection.
- Designated and Protected Areas (Natura 2000 Sites)
  - The Glenasmole Valley SAC.

The preliminary CSM outlining the identified sources, pathways and receptors is provided in Table 4-1.

Table 4-1. Preliminary Conceptual Site Model

Source	Pathway (transport and exposure mechanism)	Receptor

Proposed Development:
• ~~Surface water runoff during construction works.~~
• ~~Wash water from the storage, maintenance and washing of vehicles.~~
• ~~Discharges to ground of surface water runoff.~~
• ~~Discharges to ground from OSWTS.~~
• ~~Storage of heating oil.~~
	• Surface water migration via diffuse surface runoff.
	• Vertical Migration of discharges from the Site to groundwater.
	• Lateral Migration within the aquifer.
		• Groundwater Receptors
		  ○ Bedrock Aquifer
		  ○ ~~Groundwater users~~
		• Surface Water Receptors
		  ○ The Piperstown Stream
		  ○ The Dodder River
		• Designated and Protected Areas (Natura 2000 sites)
		  ○ The Glenasmole Valley SAC and downstream Natura 2000 sites

Note: Text with ~~strikethrough~~ indicates that element of the SPR linkage is not valid for the CSM		

4.2 SPR Linkages and Risk Assessment

The identified sources, pathways and receptors and the potential S-P-R linkages are discussed below.

4.2.1 Water Quality

There is no identified potential impact to the quality of groundwater or surface water and associated receptors attributed to the Proposed Development including potential sources associated with the washing, storage and maintenance of cars at the Site.

Wash water and any other surface runoff from within Building F will be collected within the dedicated drainage system and contained within the proposed impermeable underground storage tank. All wash water will be removed offsite by an authorised contractor in strict accordance with the Waste Management Act 1996 as amended. There will be no discharges of wash water from Building F to ground the surface water drainage network or water courses. Therefore, in the absence of any potential contaminant source there is no risk to water quality within the bedrock aquifer, Piperstown Stream and associated receptors including the Dodder River and Glenasmole Valley SAC.

There are no other identified potential impacts to groundwater or surface water quality associated with the design of the Proposed Development and other potential sources:

- The removal of potential existing sources associated with Site drainage (surface water and foul) will be removed from the Site following decommissioning.
- The heating fuel AST will be within a covered bund designed in accordance with EPA guidelines and constructed in accordance with BS EN 1992-3 and BS EN 1992-1-1+ A1. Therefore, there is no risk of any contamination of surface runoff from this area of the Site and no identified potential risk to receiving groundwater and surface water receptors.
- Only clean runoff from roofs will be discharged directly to ground. Surface runoff from the driveways and paved areas will be discharged via a Class 1 By-Pass Petrol / Oil Interceptor and grass swale which will effectively remove any potential trace contaminants in runoff (i.e., sediment, petroleum hydrocarbons, free oils / grease and metals) by filtration through surface vegetation and groundcover, by sorption of pollutants to the filter medium, and some biological uptake by vegetation and subsoil biota (Ciria, 2015 The SuDS Manual).
- There will be no impact on the receiving groundwater quality associated with the proposed new OSWTS, that will be designed and constructed in accordance with the EPA 2021 CoP, taking account to the high quality of treated effluent discharged from the OSWTS and additional attenuation that will occur in the tertiary treatment sand polishing filter.
- In a worst-case scenario, for example in the in the event of a failure of the Class 1 By-Pass Petrol / Oil Interceptor or a discharge or wash water from Building F to ground, it is considered that, in applying the precautionary principle, there may be a local impact on groundwater beneath the Site. However, taking account of the nature of the potential source hydrogeological setting of the Site (refer to Section 3.5) localised groundwater flow paths, local groundwater flow direction, transport pathways and assimilation within the aquifer and the receiving Piperstown Stream, there would be no impact on water quality within the Dodder River and the Glenasmole Valley SAC.

Overall, taking account of the hydrogeological setting of the Site, the identified SPR linkages and the proposed design of the proposed surface water drainage network and the proposed OSWTS it is anticipated that there will be no negative impact on the receiving groundwater quality and associated downgradient receptors including the Piperstown Stream, the Dodder River and the Glenasmole Valley SAC associated with discharges from the Site to groundwater.

4.2.2 Designated and Protected Areas

There is an identified potential hydraulic connection with the Glenasmole Valley SAC and other Natura 2000 sites located downstream of the Site and the Dodder River. However, taking account of the hydrological and hydrogeological setting of the Site there is no identified potential risk to the water quality of the qualifying interests of the Glenasmole SAC and other Natura 2000 sites located downstream of the Site and the Dodder River.

- Local groundwater flow beneath the Site is to the north / northwest toward the Piperstown Stream. Therefore, there is no identified hydrogeological connection between the Site and the known mapped petrifying springs and the Glenasmole Valley SAC (refer to Figure 3-7). In applying the precautionary principle, other potential unmapped springs within the SAC were also considered, however, based on local groundwater flow, there is no identified potential hydraulic connection with the Site and the SAC.
- There is no identified impact to water quality in the Dodder River associated with the Proposed Development including in the worst case unmitigated scenario.
- There are no groundwater or surface water dependent habitats downstream of where the Piperstown Stream discharges to the Dodder River and the Glenasmole Valley SAC (OES, 2023).
- There is no identified negative impact on water quality within the Dodder River and therefore, there is no identified negative impact on Other Natura 2000 sites that are hydraulically connected to the Site which are located at the closest point more than 20.5km downstream of where the Piperstown Stream discharges to the Dodder River.

5 CONCLUSIONS

EGC carried out a hydrological and hydrogeological assessment for the Proposed Development at Glenside House, Glassamucky, Bohernabreena, Dublin 24 to address to address Item 2(a) of SDCC's RAI dated the 2nd August 2022.

The objective of the risk-based hydrological and hydrogeological assessment was to determine if there will be any potential impact on the petrifying springs in the Glenasmole Valley SAC arising from the storage, maintenance and washing of vintage cars on the Site.

Based on the results of the risk-based assessment the following can be concluded

- The Site is located within the Dodder River sub-catchment and the closest water course is the Piperstown Stream which adjoins the north / northwest Site boundary of the Site and discharges to the Dodder River.
- Locally groundwater flow beneath the Site is to be to the north / northwest toward the Piperstown Stream.
- The Glenasmole Valley SAC is located to the west of the Site and is the key potential receptor associated with the Site.
- There is an identified potential hydraulic connection between the Site and the Glenasmole Valley SAC via surface water as the Piperstown Stream adjoining the north / northwest Site boundary discharges directly to the Dodder River and the Glenasmole Valley SAC. There is no identified direct hydraulic connection via groundwater flow which between the Site and the Glenasmole Valley SAC including the petrifying springs.
- There are no identified potential impacts to water quality of the Piperstown Stream and Dodder River and downstream receptors associated with the Proposed Developmentand no identified potential for deterioration in water quality or impact on the receiving environment associated with the Proposed Development in a worst-case unmitigated scenario that would result in a significant effect on any Natura 2000 sites.
- Overall, there is no risk to qualifying interests of the Glenasmole Valley SAC including the petrified springs associated with the storage, maintenance and washing of vintage cars at the Site.

6 REFERENCES

Building Research Establishment, 2016. Digest 365 Soakaway Design.

BS EN 1992-3 Design of Concrete Structures for retaining aqueous liquids.

BS EN 1992-1-1+ A1 Structural use of Concrete: Code of Practice for Design.

Council Directive 80/68/EEC, 1979. On the protection of groundwater against pollution caused by certain dangerous substances. Council of European Communities.

Council Directive 2006/118/EEC, 2006. On the protection of groundwater against pollution and deterioration. European Parliament and the Council of European Communities.

Department of the Environment, Heritage and Local Government, Environmental Protection Agency and Geological Survey of Ireland, 1999. Groundwater Protection Schemes (Groundwater Protection Schemes, 1999).

Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy with amendments 2455/2001/EC, 2008/32/EC and 2008/105/EC.

Environmental Protection Agency, 2011. Guidance on the Authorisation of Discharges to Groundwater.

Environmental Protection Agency, 2021. Code of Practice, Wastewater Treatment and Disposal Systems Serving Single Houses (Population Equivalent ≤10).

Environmental Protection Agency, 2023. Envision Maps. https://gis.epa.ie/EPAMaps/Water. Consulted on 09/01/2023.

Geological Survey Ireland, 2023. Groundwater Body Reports – Kilcullen GWB - https://secure.dccae.gov.ie/GSI_DOWNLOAD/Groundwater/Reports/GWB/KilcullenGWB.pdf . Consulted on 09/01/2023.

Geological Survey of Ireland, 2023. Groundwater webmapping and databases - https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228. Consulted on 09/01/2023.

Google Earth, 2023. Google Earth webmappping - http://www.earth.google.com. Consulted on 09/01/2023.

Local Government, July 1990. No. 21.1990. Local Government (Water Pollution) (Amendment) Act, 1990

Local Government, March 1977. No. 01/1977. Local Government (Water Pollution) Act, 1977.

Mc Gillen Design Services, 2022. Proposed Drainage Layout Plan – DRG No. PP/22/02.

Openfield Ecological Services, 2023 Screening for Appropriate Assessment and Ecology Report.

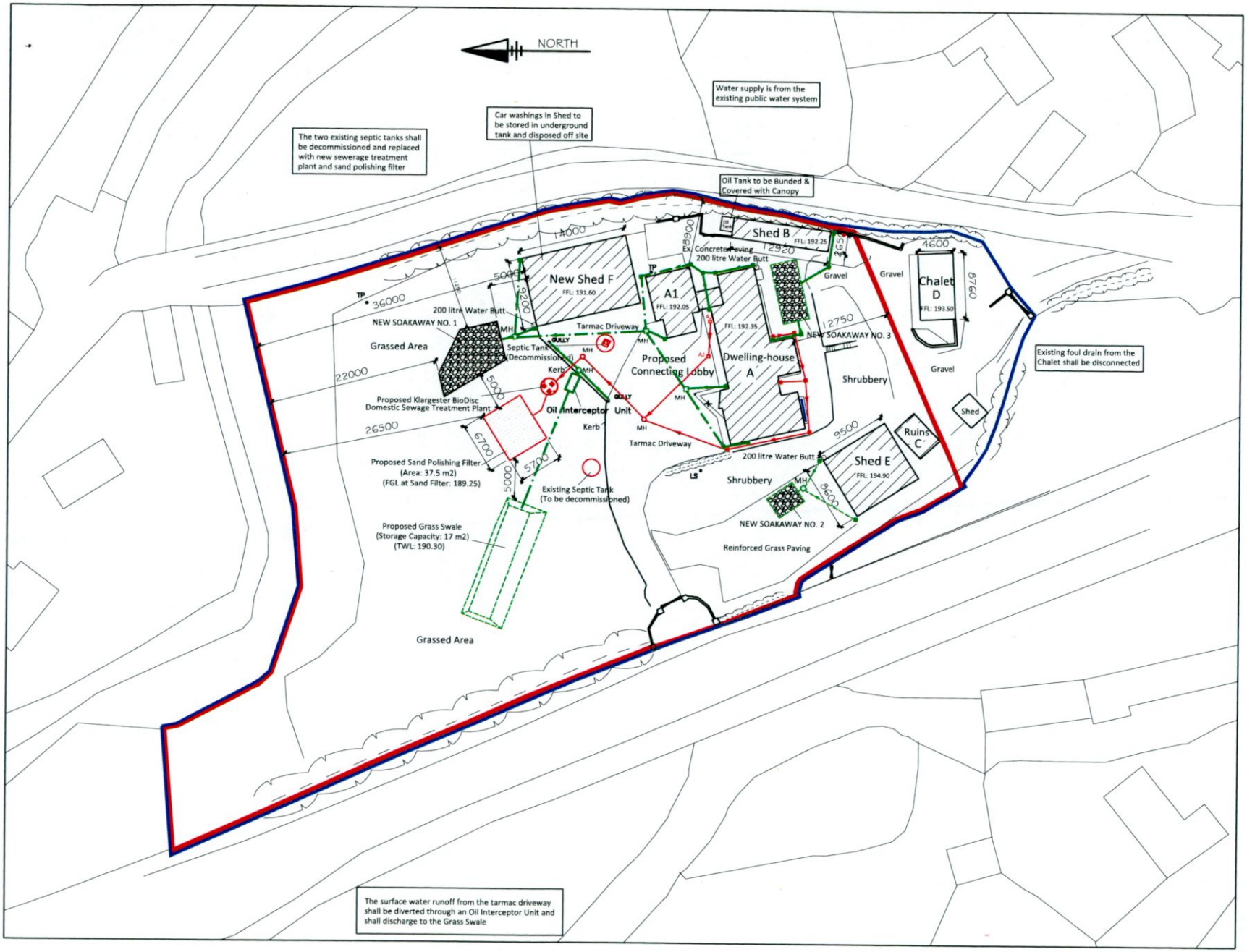
Patrick Joyce Associates, 2022 Wastewater Treatment System Report.

Patrick Joyce Associates, 2022 Surface Water Drainage Report.

South Dublin County Council, August 2022. Request for Additional Information dated 2nd August 2022.

Water Framework Directive, 2023. Water Framework Directive webmapping - http://watermaps.wfdireland.ie/NsShare_Web/. Consulted on 09/01/2023.

Appendix A



SOAKAWAY NO. 1:
50.0 m2 plan x 1.35 m effective depth

SOAKAWAY NO. 2:
4.0 m x 3.0 m x 0.90 m effective depth

SOAKAWAY NO. 3:
8.0 m x 3.5 m x 0.75 m effective depth

PROPOSED SITE LAYOUT PLAN SCALE 1:500 (A3)

ISSUED FOR PLANNING PERMISSION PURPOSES ONLY

MCGILLEN DESIGN SERVICES
PLANNING AND PROJECT MANAGEMENT

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REV	DESCRIPTION	BY	APPR	DATE
G	AMENDMENTS	P.J.	P.J.	12.12.23
F	ISSUED FOR APPROVAL	P.J.	P.J.	16.12.23
E	ISSUED FOR PLANNING PERMISSION PURPOSES	P.J.	P.J.	26.05.23
D	ISSUED FOR PLANNING PERMISSION PURPOSES	P.J.	P.J.	07.03.23
C	ISSUED FOR APPROVAL	P.J.	P.J.	10.02.22
B	LEVELS ADDED	P.J.	P.J.	01.10.21
A	PRELIMINARY	P.J.	P.J.	26.07.21

CLIENT: **MR. GARY McKEON**

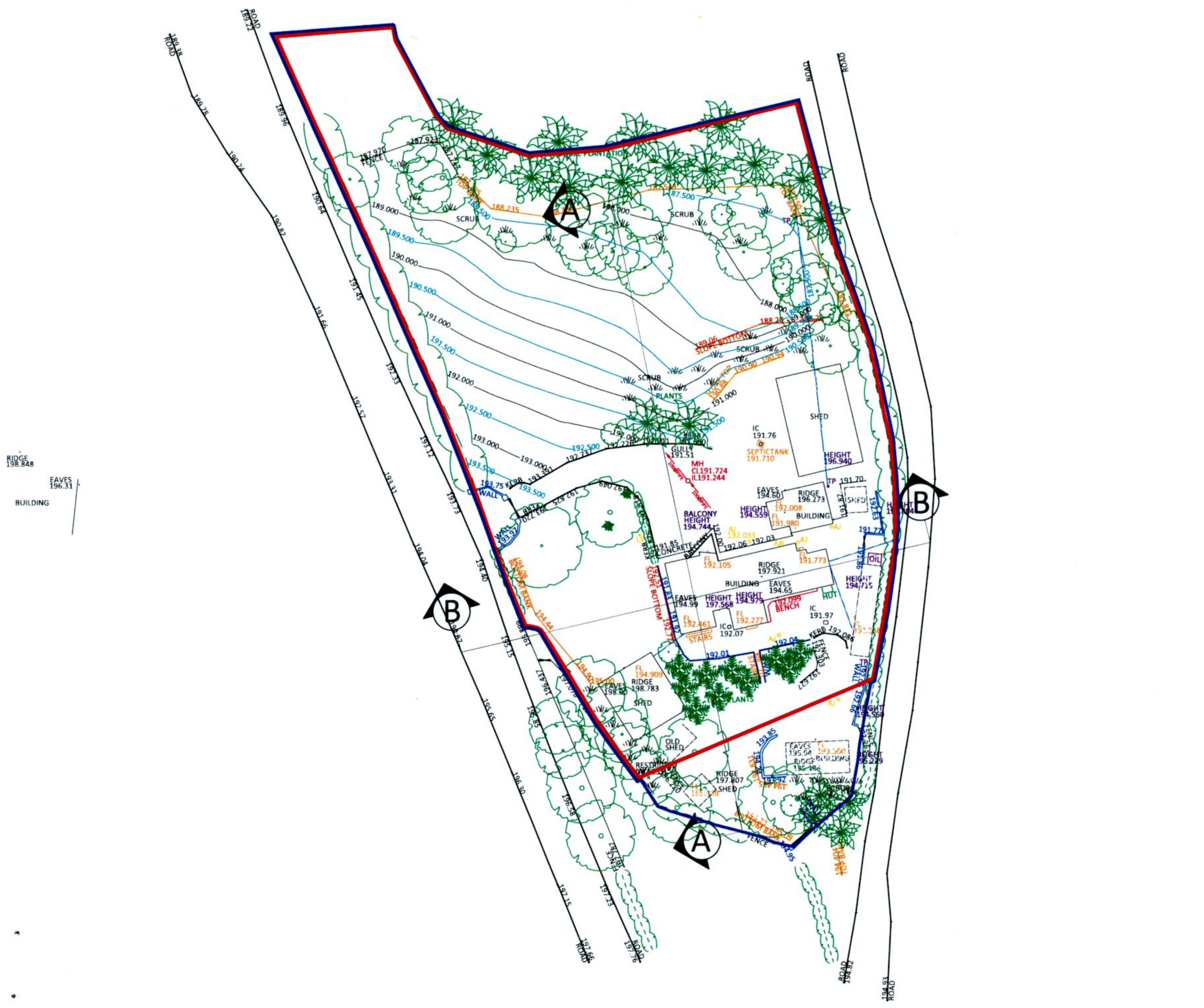
PROJECT: **EXISTING DEVELOPMENT AT GLASSAMUCKY, BOHERNABREENA, DUBLIN 24**

TITLE: **PROPOSED DRAINAGE LAYOUT PLAN**

PATRICK JOYCE ASSOCIATES
CONSULTING ENGINEERS
2 Prospect Grove, Stocking Lane, Rathfarnham, Dublin 16
Telephone: (01) 494 6745
E-Mail: patrickjoyceassociates@gmail.com

DESIGNED:	CHECKED:	APPRD:
P.J.	P.J.	P.J.
DRAWN: P.J.	DATE: JULY-2021	SCALE: 1:500

DRG.No. PP/22/02 REV. G



SURVEY LEGEND

Symbol	Description
AJ	ARMSTRONG JUNCTION
AV	AIR VALVE
BB	BOTTOM OF BANK
BLD	BOLLARD
CATV	CABLE TV
CL	COVER LEVEL
EIR	EIR MANHOLE
EP	ELECTRICITY POLE
ESB	ELECTRICITY SERVICE COVER
FCE	FENCE
FL	FLOOR LEVEL
FH	FIRE HYDRANT
FWAJ	FOUL WATER AJ
FW	FOUL WATER
GAS	GAS SERVICE COVER
GY	GULLY
HYD	HYDRANT
HGE	HEDGE
IC	INSPECTION CHAMBER
IL	INVERT LEVEL
KB	KERB
KBBOT	KERB BOTTOM
KBTOP	KERB TOP
LS	LAMP STANDARD
LVL	LEVEL
MH	MANHOLE
RD	ROAD EDGE
SB	SLOPE BOTTOM
SC	STOP COCK
SP	SIGNPOST
ST	SLOPE TOP
SV	SLUICE VALVE
SWAJ	SURFACE WATER AJ
SW	SURFACE WATER
TB	TOP OF BANK
TL	TRAFFIC LIGHT
TOW	TOP OF WALL
TP	TELEGRAPH POLE
UTO	UNABLE TO OPEN
UTS	UNABLE TO SURVEY
V	VALVE
WLVL	WATER LEVEL
WM	WATER METRE
WV	WATER VALVE

Datum OSI

Grid System ITM

Ordnance Survey map ref: N/A

J Weir Land Surveying Ltd.

Ballyclare, Longwood, Co. Meath.
Tel: (046) 9555068 Web: jweirlandsurveying.com
Mobile: (086) 172 8780 Email: info@jweirlandsurveying.com

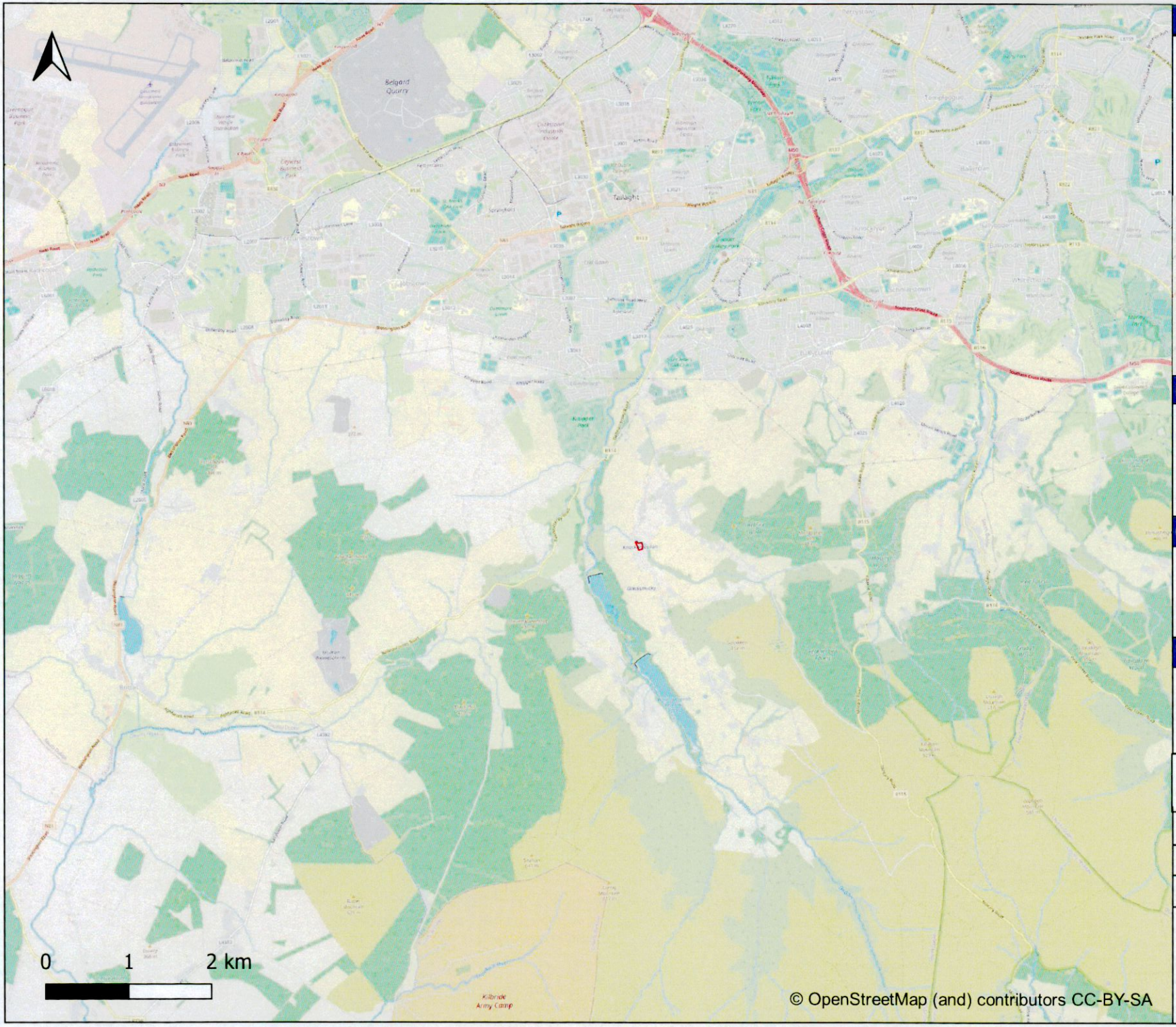
Rev.	Date	Description

Drawing Title Topographical survey

Project Glenside House, Bohernabreena, Dublin 24.

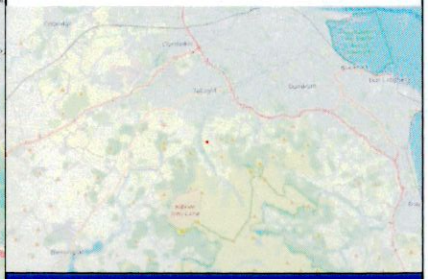
Client Mr. Gary McKeon		**Survey Date** 20-09-22
Drawing No. 2209-089-01	**Sheet No.** N/A	**Drawing Date** 26-09-22
Scale. 1:250 at A1	**Drawn by** PK	**Issue Date** 12-10-22

Appendix B



Legend:

Approximate Site Boundary



Project:

Proposed Development at Glenside House, Glassamucky, Bohernabreena, Dublin 24

Client:

Mr. Gary Mc Keon

Title:

Site Location

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Drawn By: GC	Projection: IRENET95 / Irish Transverse Mercator
Checked: CC	
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Notes:

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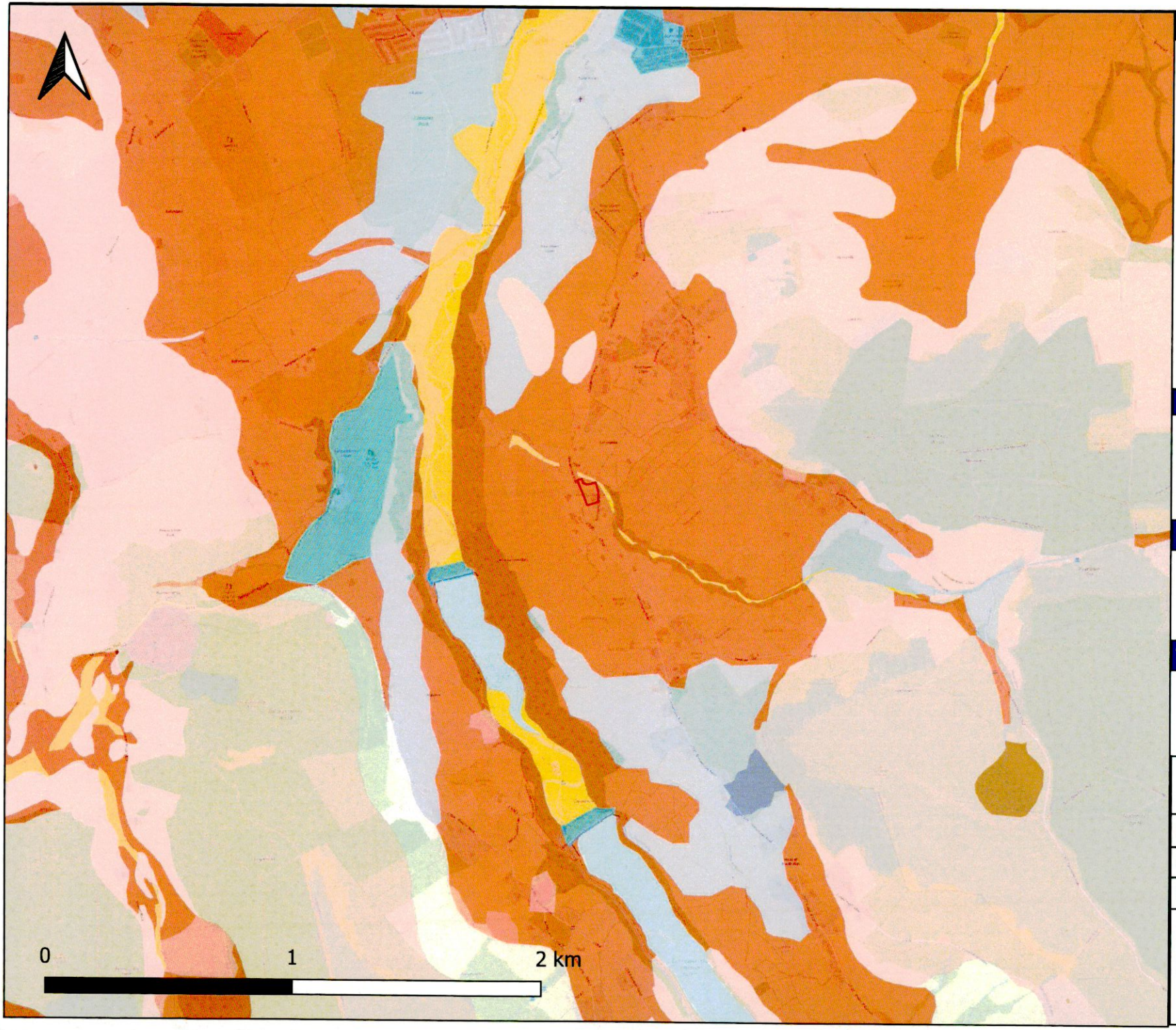

Legend:

- Approximate Site Boundary

Teagasc Soils

- AminDW - Deep well drained mineral (Mainly acidic)
- AminPD - Mineral poorly drained (Mainly acidic)
- AminPDPT - Peaty poorly drained mineral (Mainly acidic)
- AminSW - Shallow well drained mineral (Mainly acidic)
- AminSRPT - Shallow, rocky, peaty/non-peatymineral complexes (Mainly acidic)
- BminSW - Shallow well drained mineral (Mainly basic)
- BminSPPT - Shallow peaty poorly drained mineral (Mainly basic)
- BktPt - Blanket peat
- AlluvMIN - Alluvial (mineral)
- Scree - Scree
- Made - Made ground
- Water - Water

Project:

Proposed Development at Glenside House, Glassamucky, Bohernabreena, Dublin 24

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Teagasc Soils

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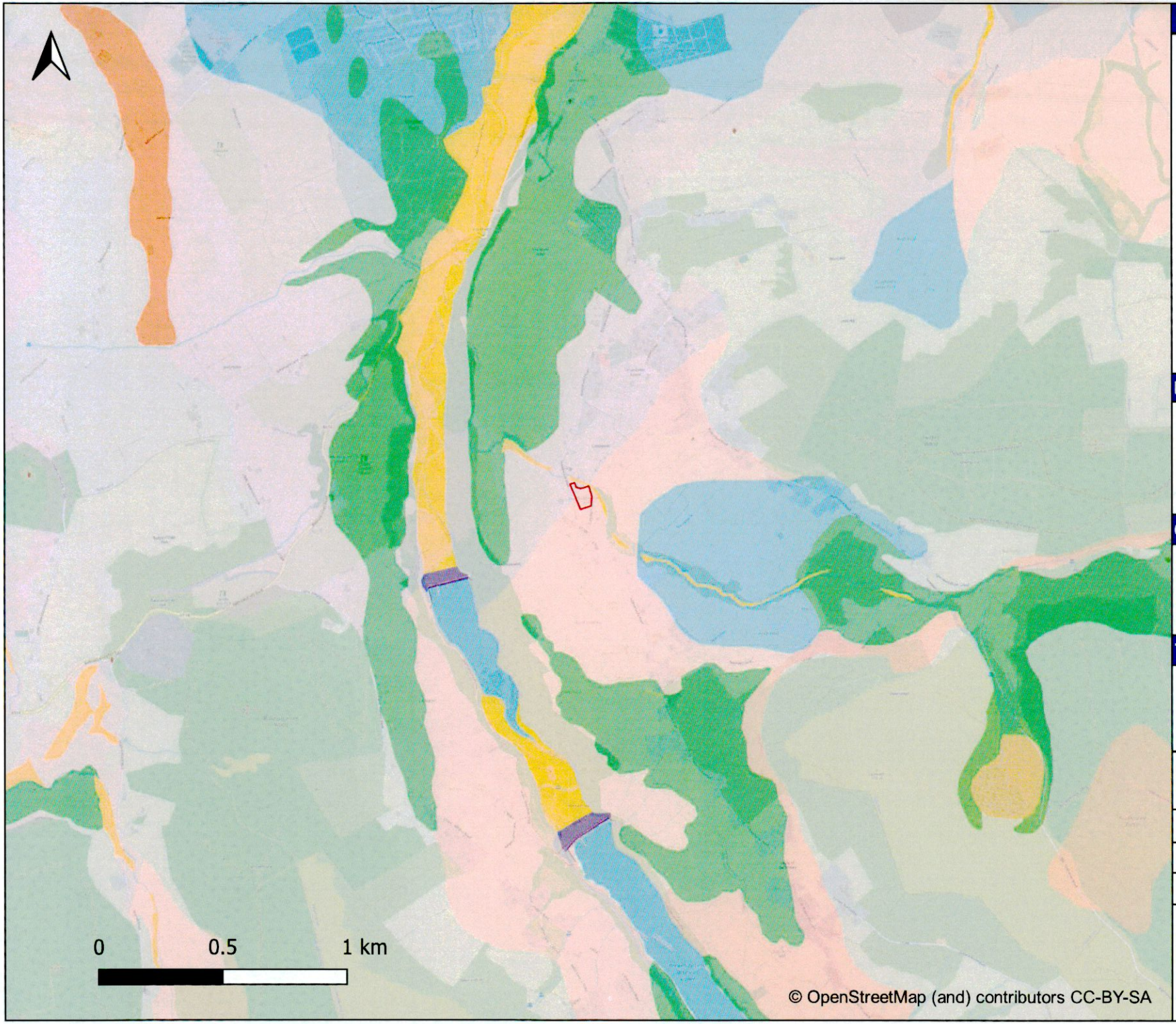

Legend:

- Approximate Site Boundary
- TMp, Till derived from Metamorphic rocks
- TLPSsS, Till derived from Lower Palaeozoic sandstones and shales
- A, Alluvium
- GLs, Gravels derived from Limestones
- TLs, Till derived from limestones
- TBi, Till derived from basic igneous rocks
- Rck, Bedrock outcrop or subcrop
- Water

Project:

Proposed Development at Glenside House, Glassamucky, Bohernabreena, Dublin 24

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Quaternary Soils

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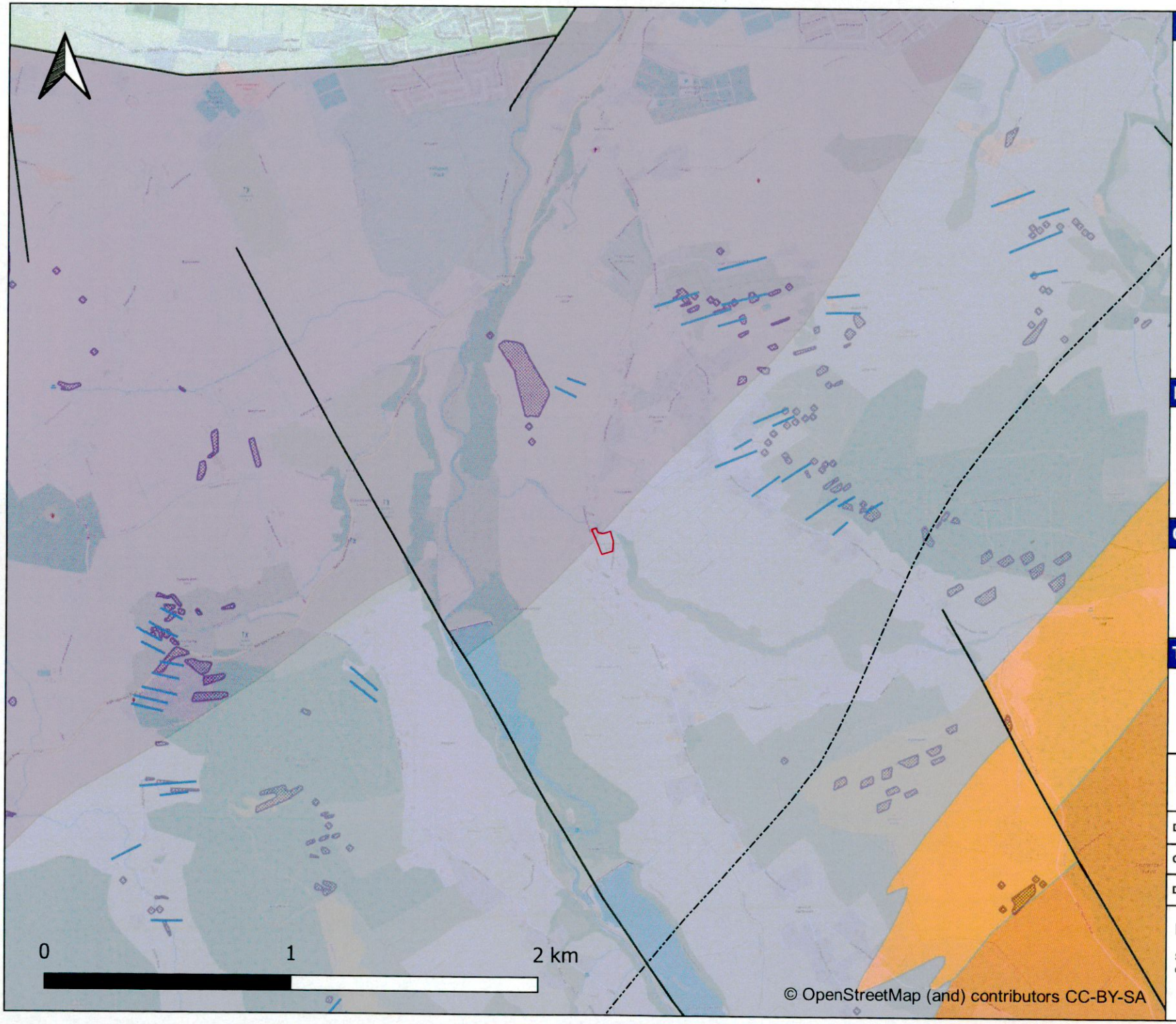

Legend:

- Approximate Site Boundary

Bedrock Geology

- Lucan Formation
- Type 2e equigranular
- Type 2p microcline porphyritic
- Aghfarrell Formation
- Butter Mountain Formation
- Pollaphuca Formation
- Bedrock Outcrops

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Proposed Development at Glenside House, Glassamucky, Bohernabreena, Dublin 24

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Bedrock Geology

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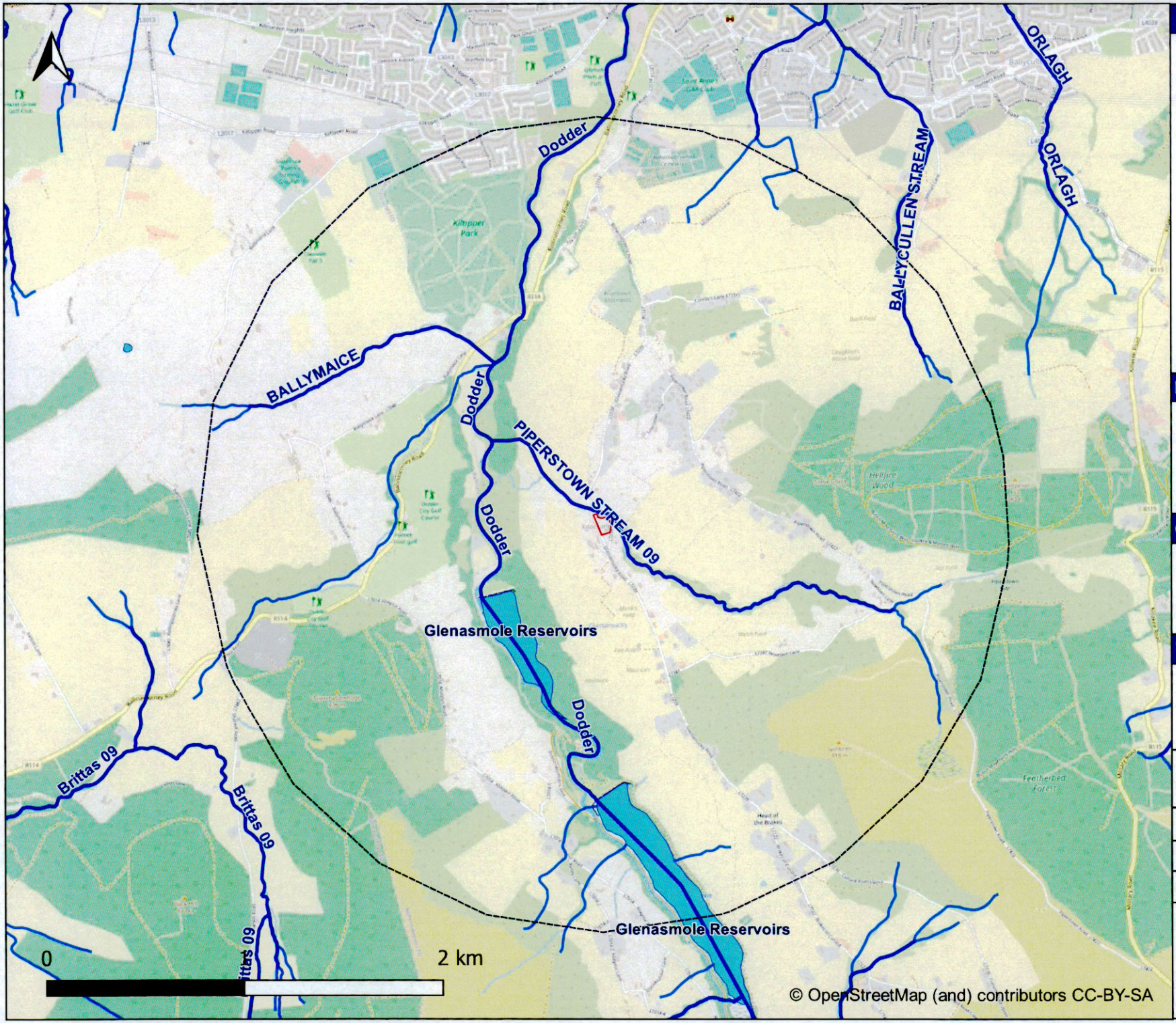

Legend:

- Approximate Site Boundary
- 2km Site Buffer
- Rivers
- Stream
- Lakes

Project:

Proposed Development at Glenside House, Glassamucky, Bohernabreena, Dublin 24

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Local Surface Water Features

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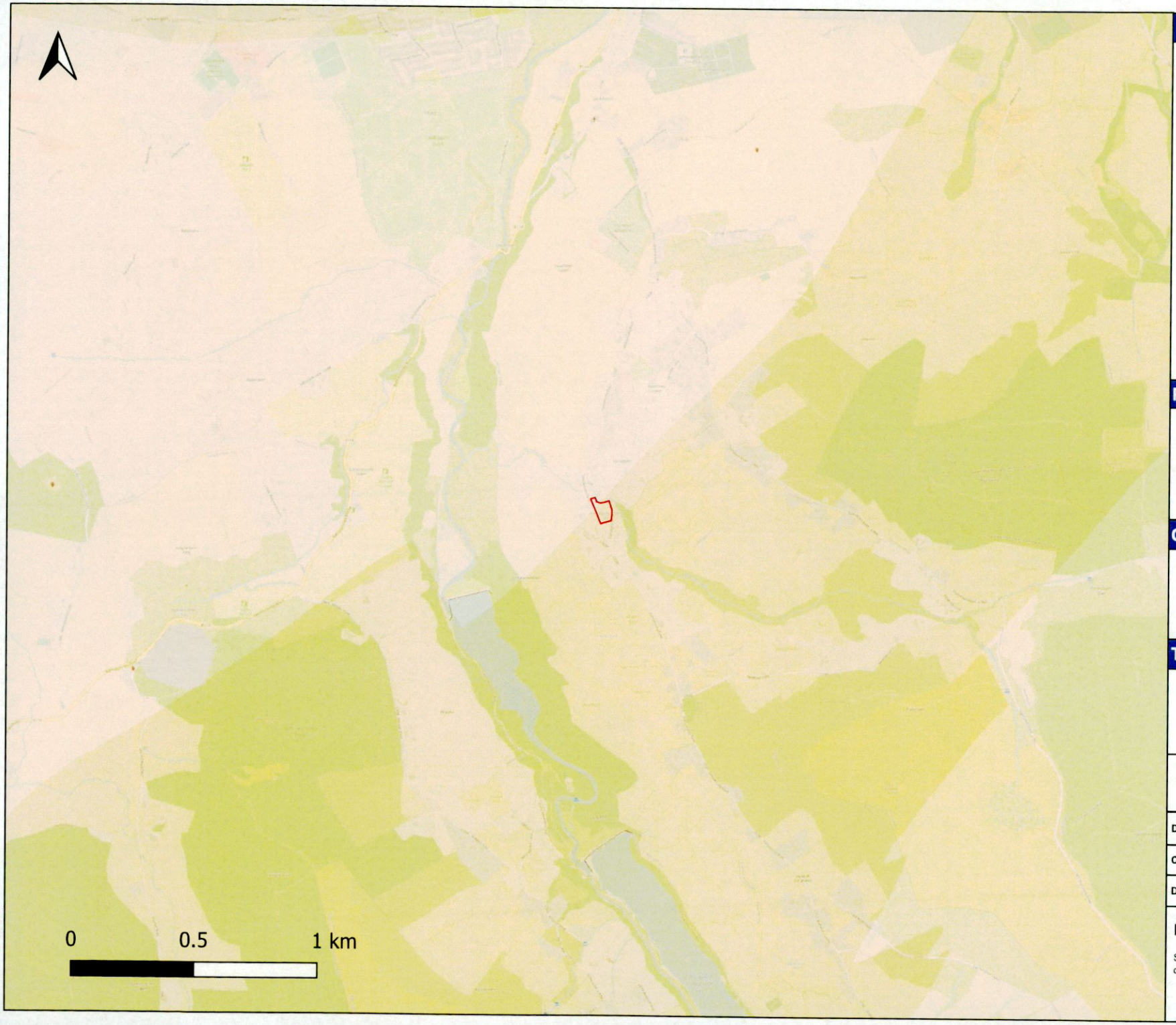

Legend:

Approximate Site Boundary

Bedrock Aquifer

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

Project:

Proposed Development at Glenside House, Glassamucky, Bohernabreena, Dublin 24

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Title:

Bedrock Aquifer

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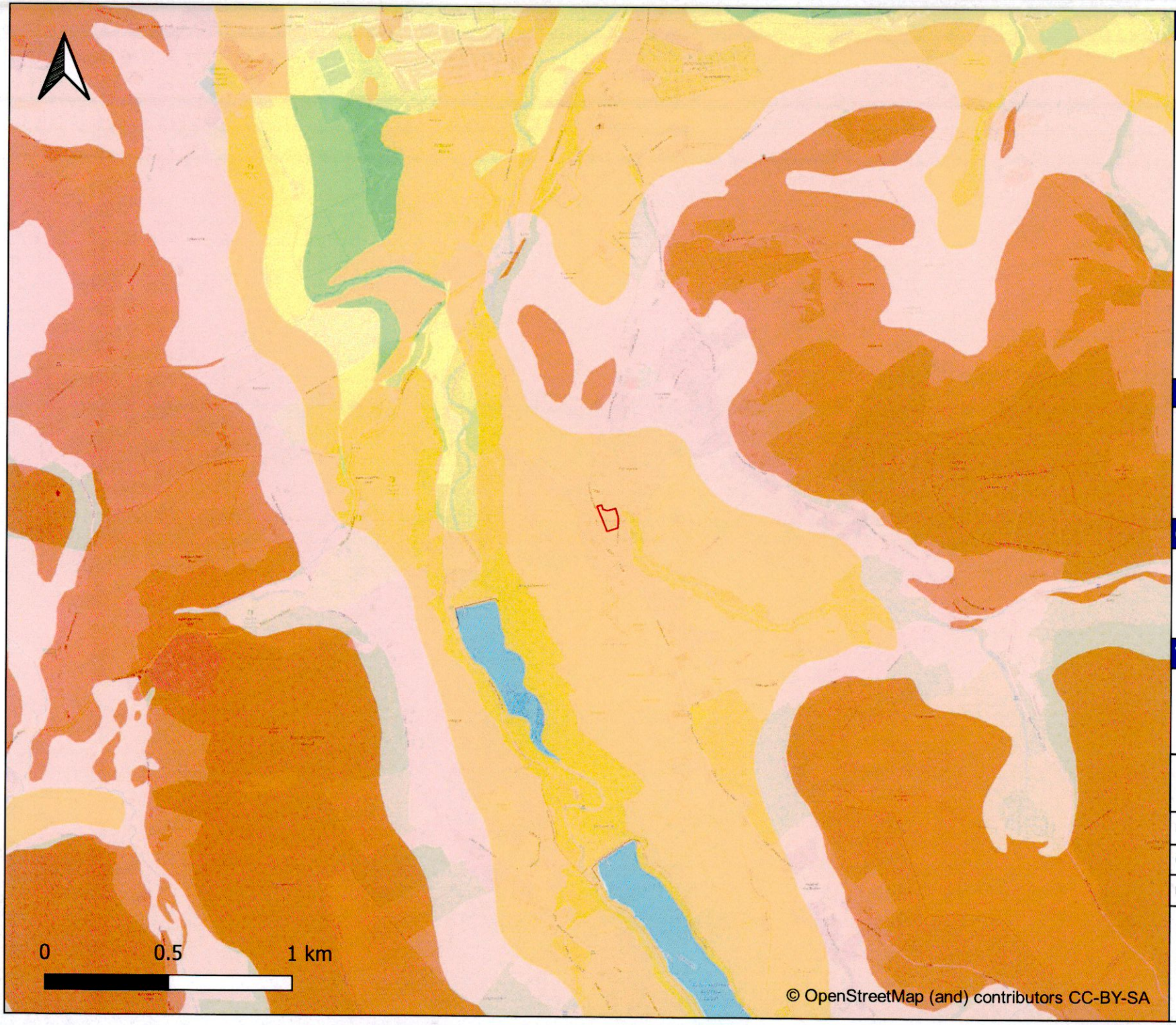
Drawn By: CS	Projection: IRENET95 / Irish Transverse Mercator
Checked: CC	
Date: 12/01/2023	Scale @ A4: 1:20000

Notes:

Site boundaries shown are for illustration purposes only and do not represent legal or exact boundaries



Legend:

- Approximate Site Boundary

Groundwater Vulnerability

- Rock Near Surface or Karst (X)
- Extreme (E)
- High (H)
- Moderate (M)
- Low (L)
- Water

Project:

Proposed Development at Glenside House, Glassamucky, Bohernabreena, Dublin 24

Client:

Mr. Gary Mc Keon

Title:

Groundwater Vulnerability

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Drawn By: GC	Projection: IRENET95 / Irish Transverse Mercator
Checked: CC	
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