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INTRODUCTION

Background

- 7.1 SLR Consulting Ireland (SLR) was requested to undertake a hydrological and hydrogeological assessment of the proposed renewable plant at the Medite MDF production facility in Clonmel, Co Tipperary. See **Chapter 2: Project Description** for details of the site and a description of the proposed development.
- 7.2 This chapter of the EIAR provides a description of hydrology (surface water) and hydrogeology (groundwater) conditions in the application area within the context of the site and regional setting and assesses the potential impacts that the proposed development will have on surface water and groundwater. Mitigation measures, if required, are proposed.
- 7.3 Available information on the surface water and groundwater of the Redmondstown, Clonmel area and its surrounds was collated and evaluated here in this chapter.
- 7.4 Unmitigated potential impacts on surface water and groundwater are considered for the initial assessment, before appropriate mitigation measures for the potential impacts identified are discussed, and then the identified potential impacts are reassessed assuming the identified mitigation measures are in place.
- 7.5 Impacts are focused on the quality and quantity of both surface water and groundwater.

Existing and Proposed Development

Existing Site Description

- 7.6 The site is located at Redmondstown, Clonmel, Co. Tipperary, approximately 4 km east of the centre of Clonmel, refer to **Figure 7-1**.
- 7.7 The site is situated in what can be predominantly characterised as an agricultural area to the north and industrial area to the south, located approximately 4 km east of the centre of Clonmel town and approximately 0.9 km north of the N24. The application site boundary has an area of 29.7 ha, within an overall landholding area of 68.3 ha.
- 7.8 The site is located north of the River Suir and is accessed via a local access road off the N24. The existing buildings in the Medite facility are situated approximately 50 m back from this local access road. The site is composed of the main production plant building and materials storage areas. All areas associated with the facility's operations are located on hardstanding.
- 7.9 The 1:50,000 scale Ordnance Survey of Ireland map (OSI) indicates that the land in the area of the subject site slopes in a south-easterly direction towards the Anner River, with an elevation range of 20 mOD to 35 mOD. The Anner River flows to the east of the subject site and connects as a tributary to the River Suir, which is approximately 1 km south of the subject site.
- 7.10 Prior to construction of the Medite facility, the original land surface sloped from 45 mOD in the northwest of the site to 20 mOD in the southeast. During the construction in 1982 the topography of the site was regraded to form a level working area. This has resulted in the formation of steep embankments along the northwest boundary of the site.

Proposed Development

- 7.11 The proposed development is described in Detail in **Chapter 2: Project Description** will replace all four existing aging thermal energy systems serving both of Medite's two production lines, specifically:
- the two-wood biomass fired boilers (18MW each) and the natural gas-fired Thermal Fluid Heater (TFH) (6MW) serving Production Line 1.
 - the wood biomass fired Thermal Fluid Heater (19MW) serving Production Line 2.
- 7.12 The applicant is proposing the replacement of existing aging biomass boilers, biomass thermal fluid heater and gas fired thermal fluid heater, serving both of Medite's two MDF production lines. The new renewable energy plants will have a rated thermal capacity of up to 60 MW and 30 MW for Line 1 and Line 2 production lines respectively, at the existing MDF manufacturing plant.
- 7.13 The proposed development will be located within the confines of the existing Medite site and within three primary development areas as outlined in **Chapter 2: Project Description**.

Licences / Permits

- 7.14 Medite is regulated by an Industrial Emissions Licence (Reg. No. P0027-04) granted on 7th March 2017.

Scope of Work / EIA Scoping

- 7.15 The scope of this chapter includes:
- An assessment of the existing surface water and groundwater at the site and within c. 5 km of the site application area, which is in line with the IGI Guidelines for study area where karst is present. The appropriate study area for the EIAR is discussed later in this chapter;
 - An assessment of the potential impact of the proposed development on surface water and groundwater; and
 - Where necessary, recommendation(s) of mitigation measures to reduce or eliminate any potential impact(s).

Consultations / Consultees

- 7.16 Consultations regarding the proposed development have been undertaken with statutory bodies as set out in **Chapter 1** of this EIAR. In relation to this water chapter, consultations were undertaken with Inland Fisheries Ireland (IFI) and the National Parks and Wildlife Service (NPWS).
- 7.17 A number of queries were raised during the consultations in relation to the proposed development and the existing infrastructure at the site. The consultation responses are set out in **Chapter 1** of this EIAR and, where the responses relate specifically to water, they are addressed here in this chapter.

**Table 7-1
Inland Fisheries Ireland Consultation**

Consultee	Consultation Summary	Issues Addressed in Chapter 7
Inland Fisheries Ireland	<p>Acknowledgement of receipt of information. One to one meeting held on 5th August 2022.</p> <p>At this meeting, overall IFI was satisfied with the approach to sampling and baseline assessment with distribution of sample locations both upstream and downstream of the outflow. Regarding the treatment mechanisms and technologies used within the WWTP, IFI appeared satisfied that they were up to date. Overall, the river currently has Q3/4 status and they do not want to see any deterioration in that which would be in line with the good ecological status objective of the WFD.</p>	<ul style="list-style-type: none"> • Baseline description and Assessment completed; • Onsite WWTP meets Site discharge Emission Limit Values to the Anner River; and • WFD is assessed here and it is considered that the proposed development will not result in a deterioration of the current Good status of the Anner River or the River Suir.

7.18 A number of sources of information were consulted in the preparation of this EIAR section for surface water and groundwater. The sources of information consulted are outlined below in this EIAR.

Contributors / Author(s)

7.19 This chapter of the EIAR was prepared by SLR. The project team consists of:

- Orlaith Tyrrell BSc. Geol;
- Peter Glanville MSc, PhD. PGeo. EurGeol; and
- Dominica Baird BSc, MSc, CGeol, EurGeol, MIAH.

7.20 Orlaith Tyrrell BSc (Geology) is a Project Hydrogeologist with two years' experience working in groundwater consultancy. She is a member of the Institute of Geologists of Ireland (IGI) and of the International Association of Hydrogeologists (IAH). Orlaith has worked on multiple scale renewables projects and has co-authored several EIAR Water chapters for wind farm developments.

7.21 Dominica Baird BSc (Earth Science), MSc (Hydrogeology), CGeol, EurGeol is Technical Director (Hydrogeology) and has over twenty years' experience in environmental consulting, specialising in hydrogeology and water. Dominica's areas of expertise cover hydrogeology, groundwater risk assessment and contaminated land with experience gained in London, Edinburgh and Dublin. Dominica has worked on various renewable projects, mainly wind farms, as well as cable routes in Ireland and Scotland as lead hydrogeologist and has undertaken field surveys including installation of groundwater monitoring wells, water supply surveys and peat surveys. Dominica has presented findings of hydrogeological assessments at oral hearings and prepared briefs of evidence in arbitration cases. Examples of major projects include EirGrid Laois-Kilkenny Reinforcement Scheme and East-West Interconnector.

7.22 Peter is a Technical and Project Director in the Water (Hydrology and Hydrogeology) team in SLR's Dublin office. He has over twenty years' experience in environmental consulting including hydrology, geomorphology and geology and is a Professional Geologist (PGeo. EurGeol.) with the Institute of Geologists of Ireland. Peter's specialist experience is in the field of water assessments,

hydrological monitoring (hydrology and hydrogeology) and hydromorphology. He has overseen the design and practical implementation of a number of field scientific monitoring programmes, supported the management, analysis and interpretation of the scientific data collected, and written and reviewed the resultant EIAR Chapters, including Land, Soil and Geology and Water chapters, and he has also completed technical reports. Peter leads and manages a multi-disciplinary team and is very knowledgeable of health and safety considerations relevant to water related project. He has hands-on experience delivering hydrological and environmental management plans, baseline surface water and groundwater monitoring (including peat landslide hazard risk assessments), preparation of peat construction management plans, water feature survey reporting, fluvial geomorphology assessments and audits, hydromorphology assessments, Quaternary geomorphology and subsoil investigations, site specific flood risk assessments, discharge licencing and consents. Peter has worked on a wide range of projects in the minerals and mining, power, commercial and infrastructure sectors. He often leads as project manager on multi-disciplinary projects and also acts as project director for multi-disciplinary teams.

Limitations / Difficulties Encountered

- 7.23 The assessment of the hydrological and hydrogeological environment is based on published information, discharge and surface water monitoring, site visits, existing site reports, site investigations and ground investigations.
- 7.24 The assessment undertaken here should be viewed as a largely qualitative assessment of the surface water and groundwater.

REGULATORY BACKGROUND

Legislation

- 7.25 This section of the chapter contains a list of legislation and guidelines which may, as required be consulted for the preparation of this chapter of the EIAR.
- 7.26 The key European Directives / European Union Legislation apply to this surface water and groundwater assessment are:
- Environmental Impact Assessment Directive (2011/92/EU) as amended by Directive 2014/52/EU; and
 - Water Framework Directive (2000/60/EC).
- 7.27 Other European Directives which this EIAR makes reference to are listed in **Appendix 7-A**.
- 7.28 The Irish Government Acts, National Legislation and Regulations apply to this surface water and groundwater assessment listed in **Appendix 7-A**.

Planning Policy and Development Control

- 7.29 Planning Policy and Development Control relating to surface water and groundwater at the application site is governed by the local authority and set out in the Tipperary County Development Plan (CDP) 2022- 2028. This chapter has been prepared with due regard to the CDP and its policies, and they and have been reviewed as part of this assessment. Policy Objectives relating to the water environment from the development plan that relate to the water environment are presented in **Appendix 7-A**.
- 7.30 The Draft Clonmel and Environs Local Area Plan (2024-2030) is dated July 2023 and includes a Strategic Flood Risk Assessment for the plan (Appendix 6 of the LAP). This has been reviewed and is referenced in this chapter.

Guidelines

- 7.31 This EIAR has been prepared with regard to the following key Guidelines:
- Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. May 2022;
 - European Commission, Environmental impact assessment of projects - Guidance on the preparation of the environmental impact assessment report (Directive 2011/92/EU as amended by 2014/52/EU), Publications Office, 2017;
 - Institute of Geologists of Ireland. Guidelines for the Preparation of Soils, geology and Hydrogeology Chapters of Environmental Impact Statements, April 2013; and
 - National Roads Authority, 2008. Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- 7.32 In addition, this EIAR also refers to other guidelines listed in **Appendix 7-A** where applicable.

RECEIVING ENVIRONMENT

Study Area

- 7.33 For the purposes of this assessment, the study area comprises the application site the surrounding area up to 5 km reflect the sensitivity of the surface water and groundwater; this is in line with the Institute of Geologists of Ireland's (IGI) guidelines (2013) where karst environments exist at a site.
- 7.34 The IGI guidelines state that the minimum distance of 2 km should be reviewed in the context of the geological / hydrogeological environment as well as the scale of development and increased to reflect the sensitivity of the subsurface. The IGI guidelines also state that maps should be sourced to allow for the review of the geological and hydrogeological conditions that exist within a minimum of 2 km of the site boundary (from the outer limit of the planning and/or licence area) and presented at a scale of 1:25,000. The baseline maps produced in this EIAR are at a scale of 1:25,000 and include an area up to c. 3.5 km from the lands under the control of the applicant, although the actual study area extends up to 5 km as stated above for karst environments.

Baseline Study Methodology

- 7.35 The methodology used in the investigation follows the guidelines and advice notes provided by the Environmental Protection Agency (EPA) on environmental impact assessments and with due regard to the Institute of Geologists of Ireland's (IGI) guidelines (2013).
- 7.36 The methodology involved in the assessment of the hydrogeology and hydrology at the site can be summarised as follows:
- A desk study in which existing data and relevant regional data sources for the area were examined;
 - Review of existing reports;
 - Site visits in which the aspects of the sites surface water and groundwater were assessed;
 - Inclusion of details of surface and groundwater management for the site, including the existing surface water management plan;
 - Monitoring of surface water quality at the 2 no. discharge points, 2 no. monitoring points on the River Anner, and from the WWTP undertaken by Medite as part of the Industrial Emissions Licence (Reg. No. P0027-04) compliance monitoring; and
 - Analysis of the information gathered.

Sources of Information

- 7.37 The existing reports reviewed were:
- Annual Environmental Reports (Medite 2020, 2021 and 2022)
 - Annual Groundwater Monitoring Reports (Medite 2020, 2021 and 2022)
- 7.38 The desk study involved the examination of several datasets to determine the hydrological, geological and hydrogeological setting of the area, as detailed in **Table 7-2**.

Table 7-2
Regional Data Consultation for Site and Study Area

Data	Dataset
Soils	<ul style="list-style-type: none"> Irish Soils Information System - Teagasc
Subsoil Geology	<ul style="list-style-type: none"> Teagasc/GSI/EPA Subsoil Mapping
Bedrock Geology	<ul style="list-style-type: none"> GSI Groundwater Data Viewer - Bedrock Geology
Surface Water	<ul style="list-style-type: none"> OSi Discovery Series mapping; EPA Water Framework Directive data; OPW CFRAM; and Current County Development Plan and Local Area Plan.
Groundwater	<ul style="list-style-type: none"> GSI Groundwater Data Viewer - bedrock and gravel aquifers, vulnerability, water supplies, groundwater recharge; GSI Groundwater body description documents; and EPA Water Framework Directive data.
Climate	<ul style="list-style-type: none"> Met Eireann
Protected Areas, Environmental Pressures	<ul style="list-style-type: none"> EPA Water Framework Directive data; and National Parks and Wildlife Service.
Site Data	<ul style="list-style-type: none"> Annual Environmental Reports Groundwater Monitoring Reports

Field Survey / Monitoring / Inspection Works

- 7.39 Environmental monitoring is undertaken at the site by Medite under their IE Licence and the data is submitted to the EPA in the Annual Environmental Report (AER) for the sit. The monitoring of discharge water quality and groundwater is undertaken at the site by Medite and their specialists; the environmental monitoring programmes are implemented at the site and are ongoing under the IE Licence conditions.
- 7.40 In addition, a number of surface water samples were taken from the Anner River upstream and downstream of the discharges by Medite in May to August 2020 to provide information on baseline water quality conditions in the river during lower summer flows in the river. This was a once off period of water quality monitoring in the Anner River.
- 7.41 Ongoing surface water (discharge) and groundwater monitoring at the site is undertaken by Medite and also by their specialists, IE Consulting on behalf of Medite.
- 7.42 A number of site visits have been undertaken by SLR in June and October 2020 to inspect the site and the water management system at the site.

Existing Water Management and Treatment Systems

- 7.43 There is an existing water management system at the site to manage, treat and discharge storm water runoff and process water used at the site. The proposed development at the site will utilise the existing water management and treatment systems at the site which are assessed as cumulative impacts.
- 7.44 For the purpose of this EIAR the existing water management and treatment systems at the site are described here.
- 7.45 Medite operates an Environmental Management System (EMS), required under Condition 2.1 of their licence (IE Licence no. P0027-04), which facilitates the management of the environmental impacts of their activities at the site. Medite's Environmental Management System is externally certified to the ISO14001 Environmental Standard. Personnel at the site are trained in the implementation of the EMS at the site.
- 7.46 In addition, as part of the overall site management system, Medite implement a programme of Planned Preventative Maintenance (PPM) which includes:
- routine round the clock maintenance programme for plant equipment;
 - routine 8-hour planned maintenance shutdown; and
 - annual maintenance shutdown for one/two week per production line.
- 7.47 The site is composed of the main production plant building and materials storage areas. All areas associated with the facility's operations are located on hardstanding.
- 7.48 Surface Water Management will largely remain unchanged except for three additional hard standing areas at the site to facilitate the proposed development; these additional areas are shown on **Figure 7-8** and are listed below.
- 7.49 In terms of additional hard standing areas at the site the three areas are:
- **Development Area 1** - Hardstanding to be replaced with non-permeable hardstanding area of 0.46 ha.;
 - **Development Area 2** - Forested area to be replaced with non-permeable hardstanding area of 0.64 ha.; and
 - **Development Area 3** - Permeable Hardstanding to be replaced with non-permeable hardstanding area of 0.041 ha.
- 7.50 The additional hard standing at the site will be c. 1.1 ha. within an overall site application area of 29.7 ha. Therefore, the additional area or hard standing at the site is considered to be relatively insignificant in the context of the overall site.
- 7.51 In Development Area 1, the existing hard standing area will be replaced with a non-permeable hardstanding area. The existing hardstanding area will have been compacted by site traffic over the years and it is considered that this compacted surface will offer limited infiltration and during storm events, most rainfall will be as overland flow to the existing site water management system. Therefore, there will be limited change in runoff from the current situation in this area with the addition of the non-permeable surface area.
- 7.52 In Development Area 2, the replacement of a small, forested area at the site with a non-permeable hardstanding area will result in an increase in storm runoff from this area. However, only part of the new non-permeable hardstanding area is currently forested, see **Figure 7-8**, the remainder of

the new non-permeable hardstanding area is currently hardstanding and, as in Development Area 1 above, the change from the hard standing to non-permeable hardstanding will not result in a significant increase in runoff.

- 7.53 The change in the small, forested area to non-permeable hardstanding will result in an increase in runoff, however the increase will be slight compared to the overall Medite site area and the slight increase will be managed in the existing Medite water management system.
- 7.54 The site water usages for 2022 are set out in the Annual Environmental Report (AER) and are shown in Table 7-3. The mains supply water is for a potable supply to the site while the main portion of water is used in processing at the site is abstracted from the Anner River.

**Table 7-3
Annual Site Water Usage (2022)**

Source	m ³ /year	m ³ /day
Groundwater	300	0.8
Surface Water (Anner River)	396,000	1,084.2
Public Water Supply (Mains)	11,581	31.7
Total	407,881	1,116.7

- 7.55 There is no plan to increase the current water usage at the site as part of the proposed development.
- 7.56 The surface water abstraction at the site is registered with the EPA (Abstraction Registration No. R00013) is shown on **Figure 7-2**. The current abstraction rate of c. 1,100 m³/day from the river is less than 1% of the 95th percentile flow in the Anner River at the OPW flow monitoring station (ID #16010) which is c. 1.7 km upstream of the site and abstraction point. The 95th percentile flow in the Anner River at Station #16010 is c. 112,000 m³/day.
- 7.57 Existing water management and treatment infrastructure at the site which is relevant to this water impact assessment in terms of cumulative effects with the existing development includes the following:
- Wastewater Treatment plant (WWTP). An activated sludge treatment plant to treat domestic sewage and process effluent (mostly water squeezed from the wood chip during the refining stage);
 - Surface water settling lagoons including particle screens;
 - Silt traps on the northern discharge line to SW1; and
 - A hydrocarbon separator.
- 7.58 There are two in line silt traps on the discharge line to SW1 in order to treat the runoff discharge waters to remove suspended solids. The silt traps are monitored visually on a regular basis by Medite and will be cleaned out as and when required to maintain capacity.
- 7.59 Raw and auxiliary materials/substances stored on site are outlined in Chapter 2.

- 7.60 During the refining and drying processes, the wood chips / fibres are subjected to heating / wetting by the use of steam. Any excess water from the process is sent to the on-site wastewater treatment plant, which subsequently generates approx. 8,000 tonnes of wood sludge which is processed. Details of the MDF manufacture process is outlined in **Chapter 2**.
- 7.61 The waste water treatment at the site involves Primary Screening to remove larger solids, followed by Dissolved Air Flotation (DAF) treatment process and a Moving Bed Biofilm Reactor (MBBR) process, following this is an aeration basin and system of Active Sludge Clarifiers and settlement before the treated water is discharged off site to the Anner River, see process diagram of the treatment system in **Appendix 7-B**.
- 7.62 There is a Risk Management Report which covers site Firewater and Potential Spillages and was produced for compliance with Condition 9.2 of IPC licence No. P0027-02, see **Appendix 7-C**.
- 7.63 There is a hydrocarbon separator at the site and all treated storm water runoff to SW2 passes through the separator prior to discharge, see **Figure 7-1** for location of separator and **Appendix 7-D** for details of separator.
- 7.64 Under the current IE Licence (P0027-04) Schedule B.2 Emissions to Water states that the maximum discharge of water to the Anner River in any one day is 1,500 m³ at SW2 (combined process effluent and southern runoff).

Rainfall and Climate

- 7.65 The closest rainfall gauging station to Clonmel is Moore Park, which is c. 47 km southwest of the site, near Fermoy in Co. Cork. The Average Annual Rainfall (AAR) at Moore Park is 1,029.4 mm, for the climatological long-term-average (LTA) reference period 1981-2010 (Met Eireann, 2022). The average monthly rainfall values at Moore Park for this period are shown in Table 7-4 below.

Table 7-4
Long Term Average monthly rainfall total (mm) (1981 – 2010) at Moore Park (Met Eireann, 2022)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
111.0	80.1	85.5	65.6	69.3	70.2	62.0	83.6	79.5	113.3	105.4	103.9

- 7.66 Evaporation at Moore Park had a mean value of 519.4 mm/yr in 2021 (Met Eireann, 2022).

Soils and Geology

- 7.67 The soils and geology at the site are discussed in detail in **Chapter 6**. A summary of the soils and geology is provided below.

Soils and Subsoils

- 7.68 The Geological Survey of Ireland (GSI) online mapping website publishes soil maps from Teagasc. The Teagasc soils map indicates that the site is underlain by Made Ground, as the site has been shaped/levelled and developed. The soils surrounding the site are mainly mapped as deep well drained acidic mineral soils (AminDW), comprising Acid Brown Earths or Brown Podzolics with smaller areas of deep poorly drained mineral soil derived from mainly acidic parent materials (AminPD). Alluvial deposits (AlluvMIN) associated with the Anner River are mapped to the east of the site.

- 7.69 The Irish Soils Information System soils mapping indicates that the soil association at the site and in the immediate vicinity is Clonroche Association (1100a), which is described as fine loamy drift with siliceous stones.
- 7.70 The subsoils in the surrounding area are mapped as Till derived chiefly from Namurian Ricks (TNSSs) (shale and sandstone till). The GSI's recharge map classifies the till as being moderately permeable. Alluvial deposits are mapped along the floodplain of the Anner River channel to the east of the site.

Local Bedrock Geology

- 7.71 The GSI Bedrock Geology (100k) shows that the majority of the Medite site is underlain by the Waulsortian Limestone Formation from the Dinantian Series. The formation is typified by dominantly pale grey, massive unbedded / crudely bedded limestone.
- 7.72 The Dinantian Series Limestones are described as massive un-bedded lime-mudstones containing original cavities filled with calcareous cement. This bedrock is characterised by zones of intense fracture cleavage. Typically, the upper 2-3 m is loose and weathered. The closest regional fault is mapped at approximately 1,350 m east of the site. The regional faults trend predominantly in a north-south direction and also an east-west direction. In a regional geological context, the site is mapped within a heavily faulted east-west aligned structure, namely the Carrick-on-Suir Syncline.
- 7.73 Although the bedrock underlying the site is not mapped as WAdo (Waulsortian dolomitised) site specific drilling records indicate the site is underlain by dolomitised limestones (AGW1, AGW2, AGW3, AGW7 & AGW8). Dolomitisation has the effect of increasing the porosity and thus permeability of limestone. The variable depth to bedrock recorded is indicative of a mature karst bedrock landscape.
- 7.74 The depth to bedrock beneath the site is highly variable. Based on the information obtained from the borehole logs the depth to bedrock ranges from 2.7 m to 27 m below ground level, probably due to the underlying karst bedrock surface (see **Chapter 6** for description).

Radon

- 7.75 According to the EPA Radon Map of Ireland, the estimated percentage of homes in the region of the site above the reference level of 200 Bq/m³ for radon is below 20% (12.2%), meaning the site is not located within a high-risk radon area.

Surface Water - Hydrology

- 7.76 The site is located in the River Suir Valley of the Suir catchment and sub-catchment (WFD IDs 16 and 16_23 respectively). The River Suir flows eastwards c. 1 km south of the site. The Anner River, a tributary of the River Suir, flows in a southerly direction, approximately 100 m east of the site. The confluence of the Anner River with the River Suir is approximately 1 km downstream of the site. Local Surface water features are shown **Figure 7-1**.

Surface Water Quality

- 7.77 The local receiving water for the site runoff and discharge is the Anner River. The Anner River is classified as being of Good Ecological status according to the EPA River Waterbody WFD Status for the period 2013-2018. The Anner River is currently classified 'not at risk' of deteriorating in status under the WFD. The Anner River is not identified as an Area for Action under the Second-Cycle of the WFD.

- 7.78 Surface water discharge quality monitoring is undertaken by Medite under the IEL Licence for the site at the following locations, as mapped in **Figure 7-2**.
- SW1 - Treated site surface water runoff discharge from northern log storage area to the Anner River. The discharge water is treated using installed silt traps to reduce suspended solids; and
 - SW2 - combined treated site storm water runoff and treated process water discharge at emission monitoring point M2 to the Anner River.
- 7.79 Additional surface water quality monitoring was undertaken in the Anner River in May to August 2020:
- SW3 - Anner River upstream of site and SW1 discharge point; and
 - SW4 - Anner River downstream of site and SW2 discharge point.
- 7.80 The discharge water from the site comprises treated storm water runoff and process water which has been treated in the onsite WWTP. The combined discharge from site runoff and treated process water is monitored under their IE Licence P0027-04. The treated water is discharged to the Anner River.
- 7.81 In addition to their licencing monitoring Medite have undertaken additional baseline surface water quality monitoring in the Anner River upstream and downstream of the discharge point from the site at locations SW3 and SW4. This monitoring was undertaken in 2022 by Medite.
- 7.82 The discharge water quality results from the site (SW1 and SW2) and the results for the Anner River (SW3 and SW4) are shown below.

Discharge Water Quality Monitoring SW1

- 7.83 The discharge from SW1 (Northern Discharge) comprises storm water runoff only to the Anner River from the northern part of the overall Medite site. This discharge is covered by Schedule B.2 of their Industrial Emissions Licence.
- 7.84 The discharge at SW1 does not contain any treated process water from the site. The average annual discharge water quality results for 2022 and 2023 are shown in Table 7-5.

Table 7-5
SW1 Summary Average Discharge Results for Suspended Solids (2022 and 2023)

Parameter	Units	Emission Limit Value	Average 2022	Average 2023
Suspended Solids	mg/l	40 (Yearly Average Limit)	49 mg/l	51.7 mg/l

- 7.85 The discharge at SW1 is currently not compliant with the Emission Limit Value in the Industrial Emission Licence. Medite have installed two in line silt traps on the discharge line to SW1 in order to treat the runoff discharge waters to remove suspended solids. Ongoing monitoring of the discharge waters at SW1 during 2024 will indicate if the suspended solids are in compliance with ELV as set out in the licence, or if additional treatment measures are required for suspended solids.
- 7.86 The silt traps are monitored visually on a regular basis by Medite and will be cleaned out as and when required to maintain capacity.

Discharge Water Quality Monitoring SW2

7.87 The combined discharge water quality at monitoring point SW2 has been undertaken on a regular basis by Medite in line with their monitoring requirements as set out in Schedule B.2 of their Industrial Emissions Licence. Summary discharge water quality results for 2022 and 2023 (to September) are shown in Table 7-6 and Table 7-7 with Emission Limit Values.

Table 7-6
SW2 Summary Discharge Results for 2022

Parameter	Units	Emission Limit Value	Sample Count	Maximum	Average
Temperature	°C	<25	207	26	-
pH		6-9	176	9	-
BOD	mg/l	50			
COD	mg/l	150 (Yearly Average Limit)	152	-	107
Suspended Solids	mg/l	35 (Yearly Average Limit)	190	-	35
Nitrates as N	mg/l	15	29	14.88	-
Ammonia as NH3	mg/l	5	29	4.53	-
Total Orthophosphate as P	mg/l	1.5	32	1.5	-

Table 7-7
SW2 Summary Discharge Results for 2023 (January to September)

Parameter	Units	Emission Limit Value	Sample Count	Maximum	Average
Temperature	°C	<25	36	24	-
pH		6-9	36	9	-
BOD	mg/l	50	33	45	-
COD	mg/l	150 (Yearly Average Limit)	36	-	104
Suspended Solids	mg/l	35 (Yearly Average Limit)	36	-	30
Nitrates as N	mg/l	15	24	13.40	-
Ammonia as NH3	mg/l	5	24	1.58	-
Total Orthophosphate as P	mg/l	1.5	21	1.2	-

7.88 The combined storm water runoff and treated process water discharge results at SW2 indicate that the discharge is in compliance with the emission limit values as set out in the IE licence for the period 2022 and 2023 (to September).

Surface Water Quality Monitoring in the Anner River (SW3 and SW4)

7.89 The baseline surface water quality results for the Anner River are shown on the attached spreadsheet, see **Appendix 7-E Site Discharge and Surface Water Quality Results**. The test results have been screened against the environmental quality standards outlined in S.I. No. 272 2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 and the amended Regulations 2012, 2015, 2019, 2021, 2022 and 2023.

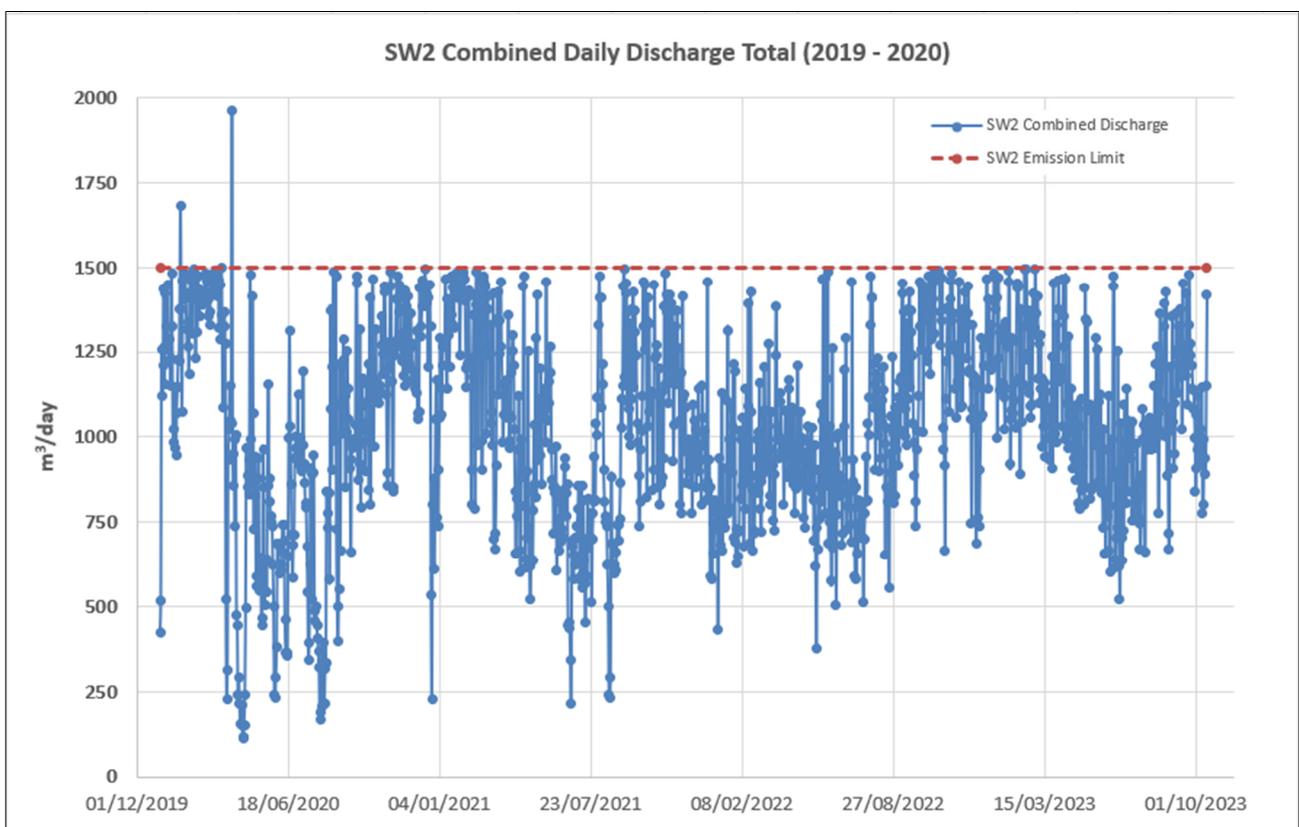
7.90 The concentration limits for surface waters outlined in these standards were exceeded for Phosphorus and BOD over multiple monitoring rounds at both the upstream and downstream monitoring points on the Anner River. The only other parameter that has been exceeded at the river monitoring points is Ammonia once at SW3 and twice at SW4 the downstream monitoring point.

7.91 The Phosphorous, BOD and Ammonia exceedances in water quality upstream of the Medite site indicates a catchment wide source for these parameters from human activities. Possible sources in the catchment include domestic foul water treatment systems and/or agricultural activities in the catchment. As the samples are upstream of the Medite site and discharge then they are not considered to be the source for these parameters in the samples.

Site Discharge Volumes

- 7.92 The maximum site discharge volume at SW2 (combined process effluent and southern runoff) to the Anner River in any one day is 1,500 m³ under Schedule B.2 Emissions to Water (IE Licence P0027-04). The discharge at SW2 is monitored by Medite and the total daily discharge volumes are shown in Diagram 7-1 below.
- 7.93 The total combined daily discharge from the site to the Anner River is shown below in Diagram 7-1 for Emission Point SW2 for 2019 to October 2023. The combined discharge is below the Emission Limit Value (ELV) of 1,500 m³/day over the period shown except for two occasions in 2019, on the 28th January and the 5th April.

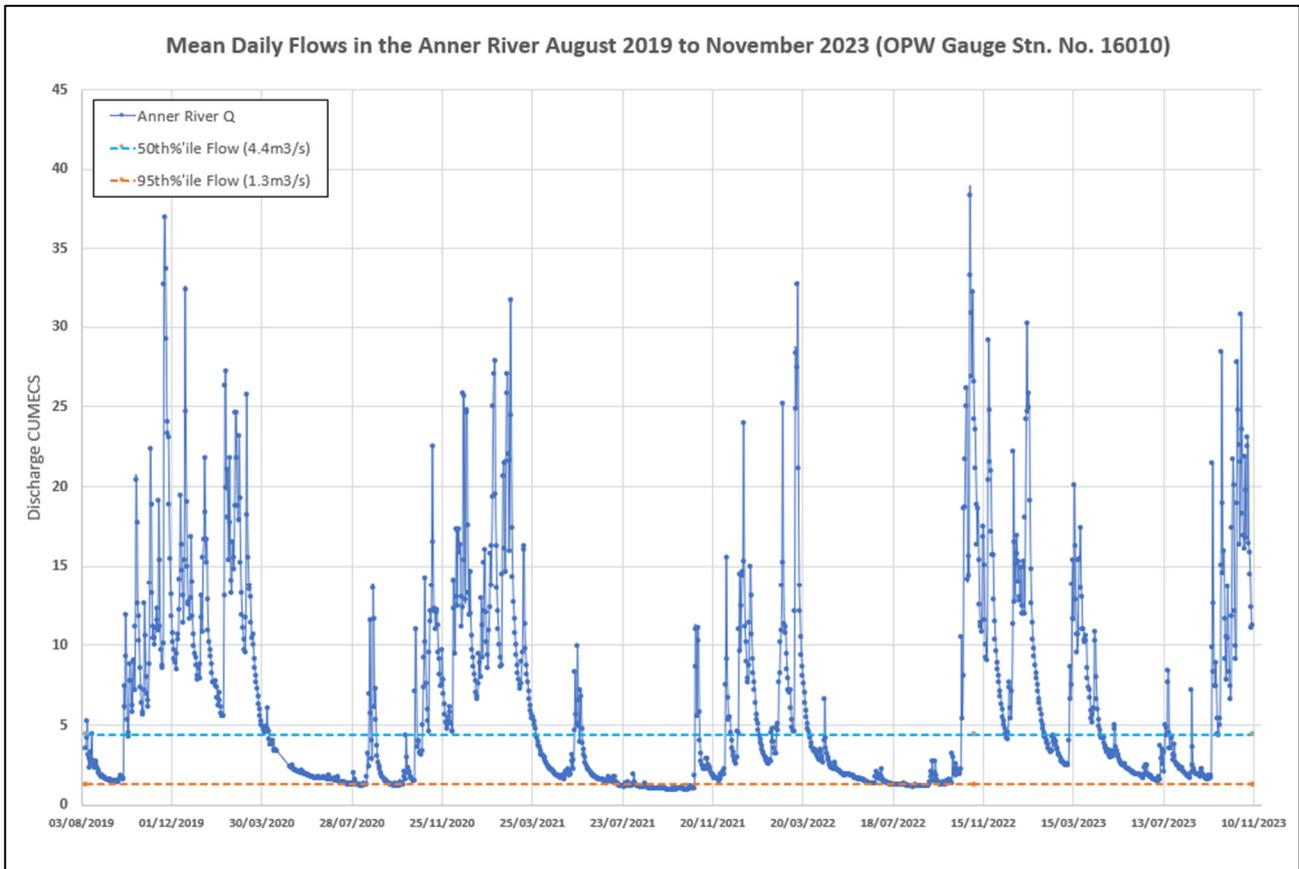
Diagram 7-1
SW2 Combined Site Discharge Daily Totals (2020-2023)



Surface Water Levels and Flow

- 7.94 There is an active OPW flow monitoring station on the Anner River c. 1.7 km northeast of and upstream of the site. The monitoring station ID is Anner (Station #16010). River flow data (Mean Daily Flows) from 2019 to November 2022, the most recent available data from OPW, is shown in Diagram 7-2 below.
- 7.95 The flow monitoring data for the River Anner indicates that the 50th percentile flow is 4.4 m³/s while the 95th percentile flow is 1.3 m³/s, see Diagram 7-2 below.

Diagram 7-2
Anner River Daily Mean Flows (2019-2023)



Flooding

- 7.96 The Office of Public Works (OPW) is the government agency with statutory responsibility for flooding in Ireland.
- 7.97 The Planning System and Flood Risk Management Guidelines for Planning Authorities (the Guidelines) were published in 2009 by the Office of Public Works (OPW) and Department of the Environment, Heritage and Local Government (DoEHLG). Their aim is to ensure that flood risk is considered in development proposals and the assessment of planning applications.
- 7.98 The Guidelines discuss flood risk in terms of flood zones A, B, and C, which correspond to areas of high, medium, or low probability of flooding, respectively. The extents of each flood zone are based on the Annual Exceedance Probability (AEP) of various flood events.
- 7.99 The Guidelines also categorise different types of development into three vulnerability classes based on their sensitivity to flooding. Under these guidelines, the Medite facility can be classed as “less vulnerable”.
- 7.100 The OPW website (www.floodinfo.ie) indicates that there are no documented flood events at the site, however there are three documented past flood events in the vicinity of the site at Redmondstown.

- 7.101 One is a recurring flood event recorded c. 0.3 km southeast of the site at Kilaloan Upper (flood ID 4310). Flooding here is associated with overflow from the Anner River with lands on either side along the lower reaches flooding regularly.
- 7.102 There is a second recurring flood event recorded c. 0.4 km west of the site along the local road at Redmondstown (flood ID 4336) and a third recurring flood event c. 0.45 km north of the site at Mockler's Bridge (flood ID 4335). Flooding at these two locations is recorded as being caused by an increase in run-off from the adjacent lands leading to flooding of the roads after heavy rainfall, often rendering them partially impassable. It is not expected that flooding at these locations will affect the Medite facility.
- 7.103 Flood modelling undertaken by the OPW as part of the Catchment Flood Risk Assessment and Management (CFRAM) project for the Anner River indicates that the Medite facility is located in Flood Zone C. The OPW mid-range future scenario (MRFS) flood modelling, which takes into account predicted climate change, indicates that the Medite Site is still in Flood Zone C.
- 7.104 A Strategic Flood Risk Assessment (SFRA) was undertaken for the Draft Clonmel and Environs Local Area Plan (2024-2030). A Stage 2 SFRA was completed for the LAP in order to:
- Confirm the sources of that may affect zoned lands and adjacent areas;
 - Appraise the adequacy of existing flood information identified in the Stage 1 SFRA; and
 - Scope the extent of the risk of flooding through the preparation of flood zone maps.
- 7.105 The SFRA report states that proposed developments should consider the impact of surface water flood risks on drainage design where the site is located in Flood Zones A and B. The application area at the Medite site is located in the fluvial Flood Zone C, see Paragraph 7.110 below.
- 7.106 The application area at the Medite site is outside of fluvial Flood Zones A and B, and therefore the zoned lands were not included in the Plan Justification Test undertaken as part of the SFRA.
- 7.107 The SFRA included eight measures relating to flood risk and drainage which have been integrated into the draft LAP. In combination with existing measures these provisions contribute towards a sustainable drainage strategy for the Clonmel and Environs Plan area.
- 7.108 The SFRA report concluded that the Land use zoning contained within the Draft LAP has been informed by the SFRA process and associated delineation of flood risk zones. The detailed LAP preparation process undertaken by the local authority Planning Department, combined with specialist input from the SFRA process, facilitated zoning that ensures that inappropriate development is not permitted in areas of high flood risk in Clonmel Town and environs.
- 7.109 The GSI Groundwater Flood database does not show any historical groundwater flooding in the area.
- 7.110 The available information in relation to flooding at the Medite site and in the local area indicates that the site is located in fluvial Flood Zone C for the Anner River and therefore is considered to have a low probability of flooding, based on the criteria in the flood planning guidelines.

Groundwater - Hydrogeology

- 7.111 This assessment of the groundwater environment is based on publicly available data and information as well as the annual groundwater reports for 2020, 2021 and 2022 prepared for the site by Medite's specialist, IE Consulting, who undertake the monitoring and reporting for this.

Aquifer Classification

- 7.112 The bedrock formation is classified as a Regionally Important Aquifer dominated by diffuse flow (Rkd). Groundwater flow is through karstified conduits, developed as a result of solutional widening of calcite-filled cleavage planes, original cavities, fissures and fractures, especially fault zones.

Groundwater Body

- 7.113 The site is located within the Clonmel Groundwater Body (GWB), see **Figure 7-4**. Initial characterisations of the GWBs have been developed by the GSI and augmented by the River Basin District (RBD) consultants and are presented in **Appendix 7-F**. Although the Clonmel GWB extends to a significantly larger area than the Medite site, a summary of the groundwater body description where it relates to the general location of the Medite Site is included here.
- 7.114 The Clonmel GWB body represents an area of low elevation surrounded on nearly all sides by higher mountains. To the east there is the peak of Slievenamon, to the southeast there are the Comeragh Mountains and to the southwest there are the Knockmealdown Mountains. The groundwater body itself is contained within the low-lying broad valley of the River Suir.
- 7.115 Most of the groundwater moves relatively rapidly along short flow paths and discharges into the streams which cross the aquifers. Limestone dissolution is the principal hydrochemical process in the strata of this area. The bedrock strata of this aquifer are Calcareous, therefore waters are hard and have a high Electrical Conductivity.
- 7.116 Hydraulic gradients in the Waulsortian Limestone are typically low (0.003 – 0.007). Flow in the karstified systems tends to be conduit flow along the fault zones.
- 7.117 Conditions in the main limestone aquifers are predominantly unconfined, as the water table is generally less than 10 m from the surface. The annual water table fluctuation is probably less than 5 m in the better aquifers.
- 7.118 Secondary permeability within the limestones has developed horizontally due to the presence of the clay wayboards. The extent of this horizontal development varies from 10 m-30 m.
- 7.119 The groundwater body is categorised as having “good” status but is “under review” with regard to meeting the 2018 Water Framework Directive (WFD) objectives.

Groundwater Protection Scheme

- 7.120 The Medite site lies within the County Tipperary (South Riding) Groundwater Protection Scheme, and a report on the scheme was issued by the GSI in 2001.
- 7.121 The Groundwater Protection Scheme report states that the Waulsortian Limestone is one of the most extensive rock units in South Tipperary and is the most important aquifer in the county. There is evidence of karstification, dolomitisation and permeability variations with depth in this aquifer. Water levels in this formation are generally quite shallow at less than 10 m although there are records of unsaturated zones of up to 30 m. Groundwater level fluctuations of 6 m between summer and winter are typical. Hydraulic gradients in the Waulsortian Limestone are typically low (0.003 - 0.007).
- 7.122 This unit is a highly productive aquifer in which very large springs are found, such as Poulalee and Poulatar near Ardfinnan. The adjacent Silverspring Formation comprises pale grey bedded cherts and dark grey siliceous biomicritic limestones and is included in this aquifer unit as it is also clean and affected by the intense faulting. The limestone outcrops at the surface at the edges of the

synclinal basin. The overlying subsoil is usually limestone till and generally less than five metres thick.

- 7.123 Detailed work at Kedrah by Jones and Fitzsimmons (1992) discovered extensive dolomitisation within the Waulsortian Formation. The dolomitisation, although part of a broad regional event, appears to be fault and/or joint controlled, with a northeast trend. A varying degree of dolomitisation is exhibited in outcrop and, though not mapped in detail, is more significant in the northern area and occurs only in small localised patches in the southern synclines.
- 7.124 The Waulsortian Limestone and Silverspring Formation in South Tipperary are classed as Regionally Important karstic aquifers (Rk).
- 7.125 This is the rock unit with the best proven aquifer potential in the southern part of South Tipperary, though less reliable in the northern part. It is capable of supplying regional schemes and large industries.

Groundwater Vulnerability

- 7.126 The GSI has developed a groundwater vulnerability classification for Ireland. The groundwater vulnerability at a particular point can be determined based on the natural geological and hydrogeological characteristics at that point. The vulnerability depends on the nature of the subsoils (i.e. their permeability characteristics), the type of recharge (point or diffuse) and the thickness of the unsaturated zone (depth to groundwater).
- 7.127 The groundwater beneath the main factory site is mapped as Moderate (M) vulnerability with areas of High (H) vulnerability extending to the west. An area of Extreme (E/X) vulnerability coincides with the mapped topographic high west of the site.
- 7.128 The groundwater underlying Development Area 2 and Development Area 3 is mapped as Moderate (M) vulnerability. A small area of High (H) vulnerability is located in the northwest part of Development Area 1, though the majority of this area is also mapped as Moderate vulnerability, see **Figure 7-5**. Based on the Aquifer Vulnerability Mapping Guidelines provided by the GSI (Table 7-8), this indicates that most of the Development Areas have between 5 m and 10 m depth of low permeability glacial till subsoils.

Table 7-8
GSI Groundwater Vulnerability Rating

Vulnerability Rating	Hydrogeological Conditions				
	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 - 3.0m	0 - 3.0m	0 - 3.0m	0 - 3.0m	-
High (H)	> 3.0m	3.0 - 10.0m	3.0 - 5.0m	> 3.0m	N/A
Moderate (M)	N/A	> 10.0m	5.0 - 10.0m	N/A	N/A
Low (L)	N/A	N/A	> 10.0m	N/A	N/A

Notes: (1) N/A = not applicable.
 (2) Precise permeability values cannot be given at present.
 (3) Release point of contaminants is assumed to be 1-2 m below ground surface.

Groundwater Recharge

- 7.129 According to the GSI groundwater recharge mapping, the average groundwater recharge beneath the site is only 136 mm/yr. due to the developed nature of the site. The average recharge figure for areas surrounding the site, i.e. undeveloped areas, is 407 mm/yr, based on the hydrogeological setting (Rkd aquifer; moderate groundwater vulnerability, moderate permeability subsoil and overlain by well-drained soil).
- 7.130 The groundwater recharge coefficient for the surrounding area is taken as 60 % of the effective rainfall (679 mm/yr).

Groundwater Levels and Flow

- 7.131 Groundwater levels are recorded at the site as part of the site groundwater monitoring plan carried out under the IE Licence. The groundwater information in this section is based on the information reported in the annual IE Consulting Groundwater Reports for 2020, 2021 and 2022.
- 7.132 Static groundwater levels are also recorded at the site on a quarterly by IE Consulting. Four rounds of groundwater level measurements are taken annually from all boreholes. The recorded groundwater levels from 2020, 2021 and 2022 are presented in the
- 7.133 **Diagram 7-3** below. The results indicate seasonal variations in groundwater levels, however the coarseness of the quarterly monitoring points does not allow any more detailed interpretation.
- 7.134 Groundwater flow is in the Waulsortian Limestones, described as massive, unbedded lime-mudstones containing cavities filled with calcareous cement and dolomitised limestone.
- 7.135 The groundwater flow paths are considered to be horizontal beneath the site. However, vertical flow paths are likely to exist closer to the Anner River, where groundwater discharges to the river. A groundwater contour map has been prepared for the site based on groundwater level data from March 2021, see conceptual model in Diagram 7-4 below.
- 7.136 The groundwater levels indicate a regional groundwater flow direction from the northwest to the southeast following the site topography towards the River Anner and River Suir; this flow direction

is consistent with the GWB description, whereby regional groundwater flows are towards the major rivers.

7.137 There is no groundwater abstraction or dewatering at the site.

Diagram 7-3
Manual Site Groundwater Level recordings (2020 to 2022)

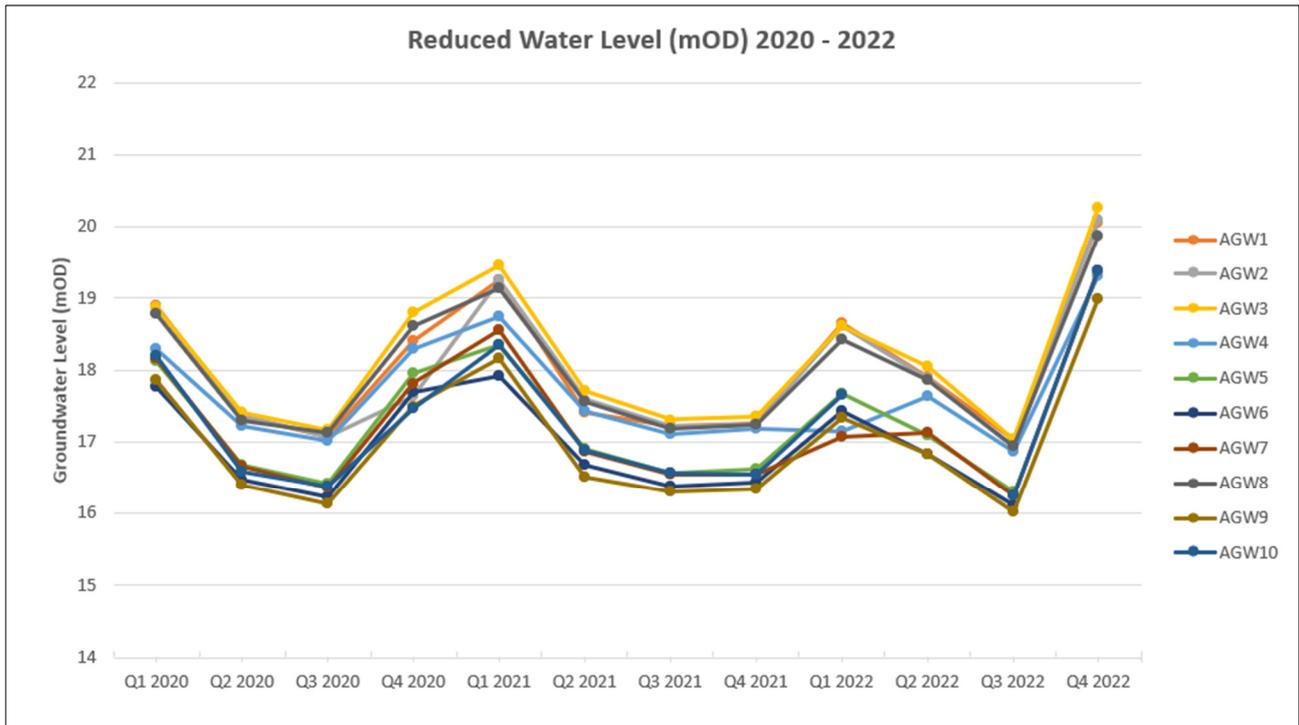
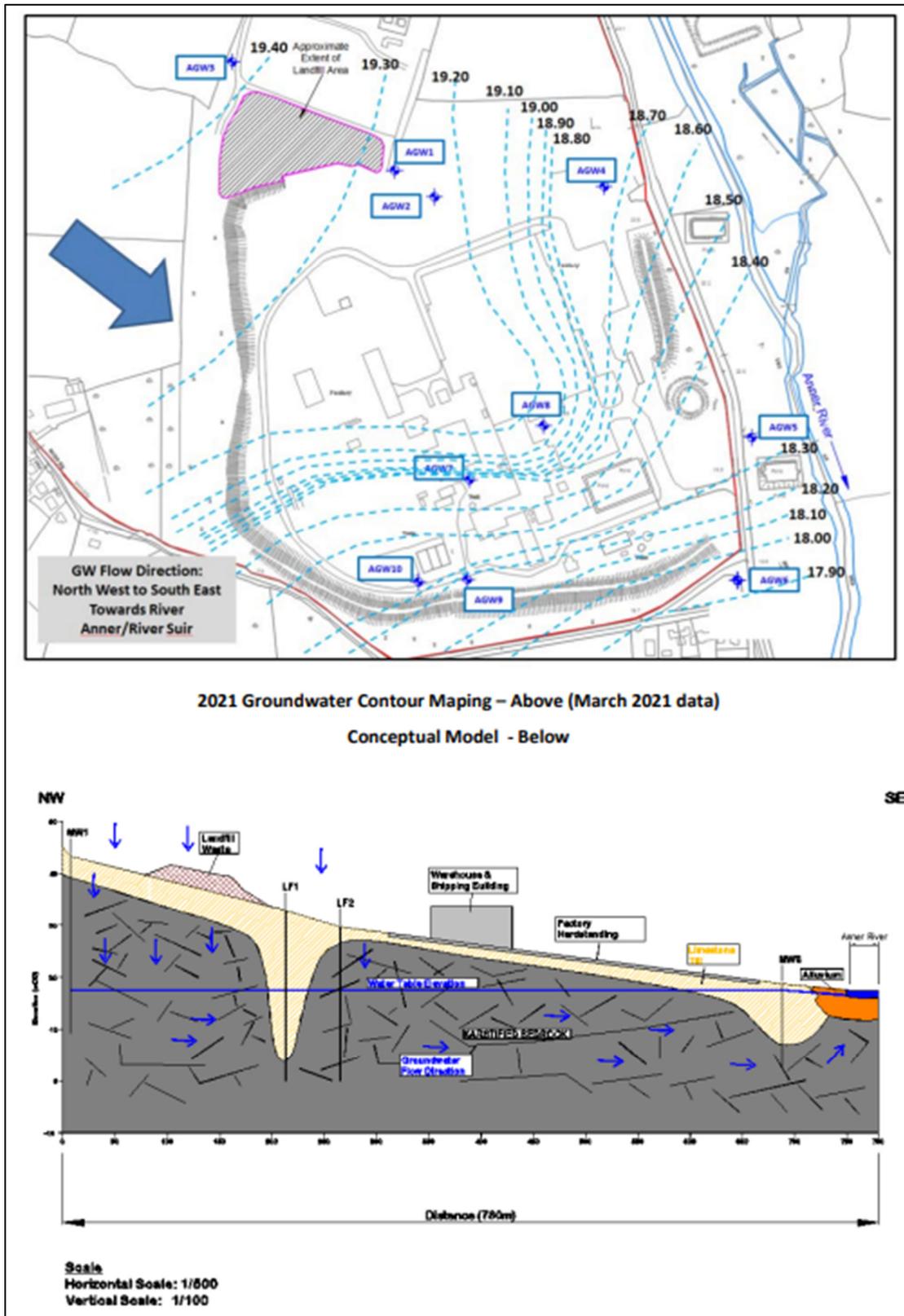


Diagram 7-4

Groundwater Contour Map and Conceptual Site Model (produced by IE Consulting on behalf of Medite)



Karst Features

- 7.138 There are no karst features in the vicinity of the site shown on the GSI karst landform database mapping. The nearest recorded karst feature is a spring (GSI code 2011NEK001) which is located c. 4 km west of the site.
- 7.139 A review of the GSI karst database indicates that there are five identified karst landforms or features within 5 km of the site. The features are recorded as a spring and four enclosed depressions, see **Figure 7-3**. Details of the features can be seen in **Table 7-9** below.

Table 7-9
Known Karst features within 5 km of Medite DAC

Karst Feature	Distance and Direction from site
Spring	4 Km West of site
Enclosed depression 1	4.4 Km Northwest of site
Enclosed depression 2	4.6 Km Northwest of site
Enclosed depression 3	4.7 Km Northwest of site
Enclosed depression 4	4.8 km Northwest of site

Groundwater Supply Wells

GSI Wells Database

- 7.140 The GSI wells and springs dataset records four boreholes around the edge of the site from 1995; three boreholes are along the eastern edge of the site and one borehole along the northwest edge of the site. There are also 13 no. supply wells recorded within a 2 km radius of the site. The 13 additional wells include:
- Seven domestic supply wells;
 - Three wells for industrial use;
 - One public supply well (under the ownership of Waterford Co. Council); and
 - Two unknown or other use.
- 7.141 The closest wells to the site include a series of four wells located between 500 m and 800 m northwest of the proposed development areas. Two of the wells are described as domestic use, with yields of poor and moderate. The other two wells are described as industrial use, with yields of moderate and fail.
- 7.142 There is also an industrial supply well approximately 570 m south of the proposed development area. The well is described as an industrial use well and the yield is not reported.
- 7.143 The public supply well (GSI ID 2011NEW002) is located approximately 1.5 km to the south east of the site at Derrinlaur Townland, on the opposite side of the River Suir to the site to the application site.
- 7.144 There are no source protection areas associated with the wells identified within a 2 km radius of the site on the GSI Group Scheme and Public Supply Source Protection Areas database.

Bulmers Facility Industrial Wells

- 7.145 There are a number of boreholes associated with the Bulmers facility located immediately to the south of the site at Annerville and to the north of the site at Redmondstown, the approximate locations of the boreholes in relation to the site are shown in **Figure 7-7**. These are not included in the GSI wells and springs dataset; details of these boreholes are included in an EIA for the Bulmers facility prepared in 2007.
- 7.146 There are four groundwater production boreholes on the Bulmers Annerville site as well as a number of exploration wells, monitoring wells and disused production wells.
- 7.147 At Redmondstown, nine trial wells were drilled with the intention to develop five of the highest yielding wells and with the remaining exploration wells being available for both water level and quality monitoring.

Historic Landfill Site

- 7.148 There is an existing historic uncapped landfill site within the application area which continues to be monitored. A Preliminary Risk Assessment Review of Landfill Contaminants of Potential Concern (COPC) was carried out by IE Consulting in August 2016 in the form of a letter submitted to the EPA (IE Consulting, 16/08/2016). This review highlighted Ammonia, Cadmium and Chloride as the main COPCs arising from the landfill and concluded that the risk to groundwater and the Anner River will be mitigated by further dilution in the bedrock aquifer with groundwater flow, see **Figure 7-3**. The current risk to the bedrock groundwater at downgradient monitoring points AGW4, AGW5, and AGW6 was concluded to be low in the report which also states that this is considered likely to extend beyond the site boundary towards the Anner River.

Medite Site - Groundwater Monitoring Boreholes

- 7.149 A total of six monitoring boreholes (AGW1-AGW6) were installed at the site between 1995 and 1997 as part of a groundwater monitoring network to provide baseline information on the groundwater environment beneath the site, see **Figure 7-2**.
- 7.150 Two further monitoring boreholes (AGW7 and AGW8) were installed in January 2016 (IE Consulting Report IE1116-1590, February 2016), see **Figure 7-2**, in order to improve the conceptual understanding of the site and determine the groundwater flow direction beneath the site.
- 7.151 Two additional monitoring boreholes (AGW9 and AGW10) were installed in October 2017 (IE Consulting report IE1232-30-2400, October 2017) in order to improve the conceptual understanding of the site and determine the groundwater flow direction beneath the site with a sufficient degree of certainty. Borehole AGW9 was installed downgradient of AGW7 and the boiler condensate pipeline and along the southern site boundary, while Borehole AGW10 was installed immediately downgradient of the chemical storage area, see **Figure 7-2**.

Medite Site - Groundwater Monitoring Results

- 7.152 A review of the groundwater monitoring and results for the site has been reported by IE Consulting in their annual groundwater monitoring reports. The purpose of the ongoing groundwater monitoring at the site is to identify any increasing or decreasing trends in Contaminants of Potential Concern (COPC) at the site.

- 7.153 Groundwater monitoring reports are completed by IE Consulting for the site on an annual basis and submitted to the EPA. A summary of the conclusions in the latest 2022 groundwater monitoring report prepared by IE Consulting is outlined here:
- Overall, there was no significant deterioration in groundwater quality in 2022, in comparison to 2021;
 - pH was reported within the range of ≥ 6.5 and ≤ 9.5 as per the EPA IGV's for all groundwater monitoring wells in 2022;
 - Boreholes AGW1 and AGW2 are located downgradient of the landfill at the site and these monitoring points continue to show compromised groundwater quality;
 - reported elevated concentrations of chloride and nitrates, along with conductivity values in excess of the lower GTV in 2022;
 - Borehole AGW4 with only Ammonia concentrations exceeding the GTV in Q3-2022;
 - Borehole AGW5 reported good water quality, with chloride and nitrate exceeding the GTV in Q4-2022 only. Orthophosphate was reported above the GTV in Q1-2022;
 - Borehole AGW6 reported good water quality, with no parameters reported in excess of the TV's for 2022;
 - Borehole AGW7 continues to report compromised groundwater quality, as a result of the historical leak from the condensate pipeline in 2016. The isolated peaks in concentrations of salts and nitrogen are attributed to when groundwater levels are seasonally higher in AGW7;
 - Borehole AGW8 reported good water quality in 2022, with slightly elevated concentrations of Chloride;
 - Borehole AGW9 is located in the centre of the plume originating from the area around AGW7. Elevated concentrations of chloride, nitrate, orthophosphate, nickel, potassium and electrical conductivity were reported at AGW9 in 2022; and
 - Borehole AGW10 is located at the edge of the plume migrating from AGW7. Elevated concentrations of Chloride, Nitrate, Orthophosphate, Potassium and Electrical Conductivity were reported in 2022.
- 7.154 A hydrogeological assessment of the plume originating at AGW7 by IE Consulting in 2021 determined that the risk to the main receptors (Regionally Important Aquifer and the River Suir) is low and that monitored natural attenuation is the best way forward to protect the groundwater resource.
- 7.155 The IE Consulting groundwater report states that key contaminants of concern such as Chloride, sodium, Potassium and Electrical Conductivity at AGW7 are reported in 2022 are all displaying downwards trends. Ammonia has stabilised and fluctuates within a narrow range, while nitrate was the only parameter to show an increase in 2021 at AGW7.
- 7.156 The IE Consulting groundwater report also states that Formaldehyde, Hydrocarbons, BTEX, Phthalates, Phenols, PAHs, VOCs and SVOCs were reported at the laboratory limit of detection in all groundwater monitoring wells throughout 2022. With one exception at AGW3 in Q4-2022 when Bis(2-ethylhexyl) phthalate exceeded the GTV

Protected Areas

7.157 A Number of protected sites have been identified in the Appropriate Assessment Screening Report / Natura Impact Statement prepared for the site. These are listed in **Table 7-10**

Table 7-10
European Sites with potential Source-Pathway-Receptor links from AA Screening Report

European Site	Site Code	Location at Closest Point to Project Site ¹	Source-Pathway-Receptor links
Lower River Suir SAC	002137	60m west	Surface Water and Groundwater
Nier Valley Woodlands SAC	000688	9.1km south	No water pathway link
Comeragh Mountains SAC	001952	9.9km south	No water pathway link
River Barrow and River Nore SAC	002162	44.3km south-east	Surface Water and Groundwater

7.158 The Kilsheelin Lake proposed Natural Heritage Area (pNHA) is located c. 2.6 km southeast of the site (ID 001701). Kilsheelin Lake is described as a nutrient-rich lake with large bird and fish populations including breeding carp, it also lies within the Lower River Suir SAC protected area. Kilsheelin Lake pNHA is not hydrologically connected to the site.

Water Framework Directive

7.159 The EU Water Framework Directive (WFD) became EU law in December 2000 and provides for a single European framework to assess water quality (Ecological status) and allows for the comparison of results across Europe. The WFD covers rivers, lakes, estuaries or transitional waters, coastal waters as well as groundwaters.

7.160 Surface waters are classified into five quality classes (status) under the WFD; High, Good, Moderate, Poor and Bad status. Groundwater is classified into just two quality classes, Good and Poor status. High status is when the water is unpolluted, while at the opposite end of the classification Bad status is when the water is highly polluted.

7.161 The WFD required baseline water quality in all waterbodies to be established for biological, chemical and hydromorphology quality. These three quality variables are combined to give the overall status classification of the waterbody; good or high ecological status and good chemical status for surface waters and good chemical and quantitative status for groundwaters.

7.162 The aim of the WFD is for all waters to achieve Good status or higher by 2027, or to protect those waters which are classified as being of Good or High status where they already exist. The WFD identifies where actions are required to achieve Good status or maintain waterbodies which are already Good or High status. Waterbodies can be restored Good and High status by using targeted actions and measures to reduce the impact of human activities on them.

¹ When measured in a straight line over the shortest distance between the Site and the Natura 2000 site.

- 7.163 For heavily modified or artificial water bodies, which are incapable of achieving good ecological status without impairing an existing specified water use, the environmental objective is to achieve good ecological potential.
- 7.164 The WFD requires that management plans are prepared on a river basin basis and specifies a structured method for developing these plans.

River Basin Management Plans

- 7.165 The River Basin Management Plans (RBMP) provide a single system of water management based on the natural delineation of river catchments and is the method by which the aims of the WFD are achieved.
- 7.166 For each river basin district in Ireland a RBMP plan needs to be established and updated every six years, to provide the context for the co-ordination requirements of the WFD key aims which are to:
- Provide for protection to all waters, surface waters and groundwater;
 - achieving Good status for all waters by 2027;
 - establish water management measures based on river basin catchment areas;
 - establish a combined approach of emission limit values and quality standards for waters;
 - involving citizen more closely in the WFD and RMBMP; and
 - streamlining and aligning national legislation.
- 7.167 The RBMP provides a detailed account of how the objectives set for each river basin in terms of ecological status, quantitative status, chemical status and protected area objectives are to be reached within the timescale of the plan. The plans include the results of the catchment analysis including the river basin's characteristics, a review of the impact of human activity on the status of waters in the basin, estimation of the effect of existing legislation and the remaining gap to meeting these objectives; and establish a set of measures designed to meet the objectives.

Third-Cycle River Basin Management Plan for Ireland 2022-2027

- 7.168 The current RMBP report for Ireland (2022-27) is at the draft stage. The draft report states that while substantial progress has been made in the management of water services and how we work together to protect, restore and improve water quality with the improvement in some areas and aspects of water quality, many waterbodies are still subject to mounting environmental pressures and overall water quality is in decline primarily due to nutrient pollution.
- 7.169 The RMBP states that due to the overall decline in water quality stronger measures are now required which will improve overall water quality; the sustainable management of water resources is important to address and adapt to the impacts of climate change, with many of the required measures having co-benefits for climate mitigation and biodiversity. Protecting and restoring water quality in Ireland will most of all need measures to address:
- the loss of agricultural nutrients to water;
 - continue to improve wastewater treatment; and
 - to re-establish natural free-flowing conditions in more rivers.
- 7.170 The plan states that Ireland's water resources and services face challenges on a number of fronts including a continued need for investment in infrastructure and an ever-increasing demand for

water services due to urbanisation, population and economic growth. These challenges are set against a backdrop of widespread, rapid, and intensifying climate change.

The River Suir and the WFD Third-Cycle

- 7.171 The surface water of the Anner River at the site is classified as being of Good ecological status under the second-cycle of the WFD (2013-2018). The surface water in the Anner River is classified as being not at risk under the third-cycle (2022-2027) of the WFD indicating that it is on track to maintain its Good status objective by the 2027 deadline.
- 7.172 The surface water of the River Suir downstream of the Anner River and downgradient of the site is classified as being overall Moderate ecological status and Good chemical status. The River Suir here is classified as being at risk under the third-cycle (2022-2027) of the WFD indicating that it is at risk of failing to meet its Good Ecological status objective by the 2027 deadline.
- 7.173 The WFD Third-Cycle Suir Catchment Report (August 2021) states that Agriculture, Forestry and Hydromorphology have been identified as Significant Pressures on the River Suir channel downgradient of the site (WFD Channel ID Suir_200). The catchment report states that:
- 'The main impacts and pressures driving the change between Cycle 2 and Cycle 3 are increases in waterbodies impacted by nutrient pollution particularly from agricultural sources. There has also been a notable increase in organic and sediment issues.'*
- 7.174 However, the WFD report does not state what the hydromorphology pressures are which it refers too.

Sensitive Receptors

- 7.175 Based on the above baseline description of the receiving environment in terms of surface water and groundwater, the following receptors have been identified based on the screening undertaken here, their importance and connection to the proposed development site:
- The Anner River;
 - Regionally important karst aquifer;
 - Local groundwater supply wells; and
 - Industrial groundwater supply boreholes (Bulmers facility).
- 7.176 For each identified receptor the significance and sensitivity of the receptor is assessed and a rating (High / Medium / Low / Negligible) is applied, see below, based on the rating of existing environment guidance Significance/ Sensitivity set out in **Appendix 7-G**.

Table 7-11
Existing environment significance/ sensitivity rating

No.	Existing Environment	Significance	Sensitivity	Existing Environment Significance/ Sensitivity Rating (H/M/L/N)
1	Anner River	<p>Anner River is good status and is not at risk of deteriorating.</p> <p>No other river abstraction activities are currently mapped in the area apart from the Medite abstraction.</p> <p>Anner River is part of the Lower River Suir SAC.</p>	<p>Anner River is not at risk of deteriorating status under the WFD.</p> <p>One of the main groundwater discharges is to rivers, there is a high degree of groundwater and surface water interactions. Groundwater flow paths can be several kilometres hence, the rivers are susceptible to any impacts on groundwater.</p>	High - Attribute has a high quality or value on a national scale primarily due to its designation.
2	Regionally Important Karstified Aquifer.	<p>The groundwater in the Clonmel GWB is regionally classified as being of good status under the WFD.</p> <p>The groundwater in the Clonmel GWB is abstracted for drinking water purposes.</p>	<p>Karst features to west and north of site.</p> <p>The groundwater risk status for reporting under the WFD is currently being reviewed by the EPA and there is no published risk at present for the GWB.</p> <p>The groundwater underlying the majority of the site is classified as being moderately vulnerable.</p> <p>Both diffuse and point recharge occur in this GWB.</p> <p>There is a high degree of groundwater surface water interactions throughout the GWB.</p>	Medium to High - Attribute has a high quality or value on a regional scale primarily because the regionally important and is used for water abstraction.
3	Local Supply Boreholes (GSI)	<p>The site is not located within a source protection area.</p> <p>Within 2 km of the site there are thirteen supply wells, seven of which are domestic use.</p> <p>One public supply well operated by Waterford Co. Council</p>	<p>Groundwater flow paths in the Clonmel GWB can be several kilometres with relatively fast flow rates in places.</p> <p>Hence wells and springs in this GWB can be susceptible to any impacts on groundwater quality.</p>	Medium to High - Attribute has a medium quality or value on a local scale as the groundwater is used as a supply.

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No.	Existing Environment	Significance	Sensitivity	Existing Environment Significance/ Sensitivity Rating (H/M/L/N)
4	Industrial Boreholes (Bulmers)	<p>There are two areas of boreholes supplying the Bulmers industrial facility. One borehole field at Annerville and one at Redmondstown.</p> <p>Borehole yields are unknown.</p>	<p>Groundwater flow paths in the Clonmel GWB can be several kilometres with relatively fast flow rates in places.</p> <p>Hence wells in this GWB can be susceptible to any impacts on groundwater quality.</p>	<p>Medium to High - Attribute has a medium quality or value on a local scale as groundwater used for industrial supply.</p>

IMPACT ASSESSMENT

Evaluation Methodology

- 7.177 The impacts on the surface water and groundwater environments are assessed in this chapter without any mitigation measures in place, in the first instance.
- 7.178 The methodology applied here is a qualitative risk assessment in which the nature of the potential impacts is described in terms of the character, magnitude, duration, probability and consequence.
- 7.179 Unmitigated potential impacts on surface water and groundwater are considered for the initial assessment, before appropriate mitigation measures for the potential impacts identified are discussed, and the identified potential impacts reassessed assuming the identified mitigation measures in place.
- 7.180 The description of the potential impact is screened against the significance and sensitivity of the receiving environment to determine the significance of the impact.
- 7.181 This approach provides a mechanism for identifying the areas where mitigation measures are required, and for identifying mitigation measures appropriate to the risk presented by the development. This approach allows effort to be focused on reducing risk where the greatest benefit may result.
- 7.182 The assessment of risk is based on a matrix on significance/ sensitivity of attributes and description of impacts. Various criteria tables outline the assessments for the likelihood and magnitude of hydrogeological impacts; these can be found in **Appendix 7-H**.
- 7.183 In addition to their nature and significance, the potential impacts are assessed in terms of whether they are direct or indirect impacts. Any cumulative impacts are assessed here also.

Construction Stage Impacts

- 7.184 The potential direct and indirect impacts to surface waters and groundwater are discussed below. In the context of the Medite DAC site, the construction stage for the proposed development is taken to be the replacement works to be undertaken within the confines of the existing Medite site as outlined in **Chapter 2** and includes all works required to construct the development including additional hardstanding areas within Development Area 1 and Development Area 2 at the site.
- 7.185 These development works will include the removal of some of the existing boiler infrastructure at the site and the installation of replacement energy plants, including ancillary infrastructure such as pipe and ducting works. These works will take place with three primary development areas at the site and are outlined above.
- 7.186 There is the potential for direct impacts on surface waters and indirect impacts on groundwater arising from the development works at the site.

Direct Impacts

Surface Water

- 7.187 The construction stage activities at the site will have the potential to increase the loading of suspended sediment and other potentially contaminating substances in surface water runoff. Impacting the adjacent Anner River and Lower River Suir SAC.

- 7.188 Accidental spillages or leaks at the site during construction have the potential to migrate to the nearby Anner River.
- 7.189 Runoff from contaminated material encountered during excavations has the potential to migrate to the Anner River.

Groundwater

- 7.190 There is the potential for any accidental spillages from vehicles or machinery to vertically migrate to the underlying locally important karstified aquifer. The moderately permeable subsoils and karstified bedrock will facilitate the movement of potentially contaminating materials to the groundwater body below and groundwater well supplies.

WFD Status

- 7.191 There is a potential for a reduction in the surface water status in terms of quality and quantity, and groundwater status in terms of quality during this stage.
- 7.192 There is no potential for a reduction in groundwater status due to quantity as there will be no major abstraction in groundwater for water requirements at the site.

Indirect Impacts

- 7.193 There is the potential for an indirect effect on the ecological status of designated areas as a result of emissions to surface water and / or groundwater during this stage.

Operational Stage Impacts

- 7.194 There is the potential for direct impacts on surface water and indirect impacts on groundwater arising from the continuance of current activities at the site during the operational stage.

Direct Impacts

Surface Water

- 7.195 There is the potential for suspended solids or fuel spillages in surface water runoff from the site areas to cause a reduction in water quality in the receiving water.
- 7.196 Accidental spillages or leaks and elevated suspended solids at the site, particularly SW1, have the potential to impact the Anner River and Lower River Suir SAC.

Groundwater

- 7.197 There is the potential for any accidental spillages from vehicles or machinery to vertically migrate to the underlying locally important karstified aquifer. The moderately permeable subsoils and karstified bedrock will facilitate the movement of potentially contaminating materials to the groundwater body below and groundwater well supplies.

WFD Status

- 7.198 There is a potential for a reduction in the surface water status in terms of quality and quantity, and groundwater status in terms of quality during this stage.
- 7.199 There is no potential for a reduction in groundwater status due to quantity as there will be no major abstraction in groundwater for water requirements at the site.

Indirect Impacts

Surface Water

- 7.200 There is a potential indirect impact on surface water in areas of forestry which supply the site with the raw product. The specific source of the product is not known as it can be sourced from Coillte and private forestry plantations across Ireland.
- 7.201 The environmental management of the commercial forestry plantations is covered by Coillte's environmental management systems (EMS) which is implemented to prevent negative environmental impacts through a system of operational controls.
- 7.202 As the potential impacts of the Coillte forestry are addressed under their own EMS it is considered that the proposed development does not have an indirect effect on surface water which may arise as a result of the plantations in locations remote to the proposed development site.

Groundwater

- 7.203 There is no major abstraction of groundwater at the site, the daily abstracted volumes of groundwater are small. There is no discharge to groundwater at the site.
- 7.204 The current activities at the site will remain unchanged after the replacement works and the operational stage of the project can be considered as equivalent to the existing operational activities.
- 7.205 There is a potential impact on groundwater quality from accidental fuel spillages and COPC storage and refuelling at the site. Accidental spillages or leaks and elevated suspended solids at the site have the potential to impact on the underlying locally important aquifer.

Ecological Status

- 7.206 There is the potential for an indirect effect on the ecological status of designated areas as a result of emissions to surface water and / or groundwater during this stage.

Decommissioning Stage Impacts

- 7.207 Decommissioning effects will be the same as the Construction Stage effects outlined above and are restated here.

Direct Impacts

Surface Water

- 7.208 The decommissioning stage activities at the site will have the potential to increase the loading of suspended sediment and other potentially contaminating substances in surface water runoff. Impacting the adjacent Anner River and Lower River Suir SAC.
- 7.209 Accidental spillages or leaks at the site during decommissioning has the potential to migrate to the nearby Anner River.

Groundwater

- 7.210 There is the potential for any accidental spillages to vertically migrate to the underlying locally important karstified aquifer. The moderately permeable subsoils and karstified bedrock will facilitate the movement of potentially contaminating materials to the groundwater body below.

WFD Status

- 7.211 There is a potential for a reduction in the surface water status in terms of quality and quantity, and groundwater status in terms of quality during this stage.
- 7.212 There is no potential for a reduction in groundwater status due to quantity as there will be no major abstraction in groundwater for water requirements at the site.

Indirect Impacts

- 7.213 There is the potential for an indirect effect on the ecological status of designated areas as a result of emissions to surface water and / or groundwater during this stage.

Post - Operational Stage Impacts

- 7.214 There is no proposed date for a cessation of works at the Medite facility.

Unplanned Events

- 7.215 It is highly unlikely that any unplanned events within the application site would result in a noticeable impact on the surface water and groundwater. Accidents could result in the spillage of fuel, which has been considered in the assessment above.

Cumulative / Synergistic Impacts

- 7.216 The existing operations at the Medite site and both consented and planned projects within 10 km of the site are listed in **Chapter 2**. Taken together, these existing and planned projects have the potential to result in cumulative effects in terms of Land, Soil and Geology.
- 7.217 All elements of the proposed project have been cumulatively assessed together, and in combination, for their overall impact, including on water.
- 7.218 The WFD Third-Cycle Suir Catchment Report states that Agriculture, Forestry and Hydromorphology have been identified as Significant Pressures on the River Suir channel. All discharge water from the site is treated so there is no cumulative impact on the WFD status of the River Suir with agriculture and forestry in the catchment.
- 7.219 There is no cumulative impact on the hydromorphology of the River Suir with agriculture and / or forestry in the catchment as the development will not result in any changes to the morphology of the river channel and floodplain.

Transboundary Impacts

- 7.220 There are no international boundaries at the site and there are no water pathways which connect the site with any international boundaries or other jurisdictions in terms of emissions to surface water and/or groundwater. Therefore, no transboundary effects will occur as a result of the proposed development.

Interaction with Other Impacts

- 7.221 In terms of surface water and groundwater there are no anticipated interactions with other potential impacts.

‘Do-nothing Scenario’

- 7.222 If the proposed development works are not permitted then the existing boilers will shortly be at the end of their life and the processing production operation at the site will cease. Until the existing boilers reach their end of life there will be no change in the current emissions and impacts, however, should production cease then there will be no further abstraction of water or emissions to surface water.

Description of Effect

- 7.223 The potential impacts outlined above during the construction and operational stages have been described in terms of the effect, i.e. character, magnitude, duration, probability and consequence, and based on this each potential impact is rated in terms of Significance of impact. i.e. High, Medium, Low and Negligible, see **Table 7-12** below.

Significant Effects

- 7.224 The significance of the potential impacts (**Table 7-12** below) is based on the significance/ sensitivity of the existing environment (**Table 7-11** above), and the description of identified potential impacts (**Table 7-12**). The Significance of Impact is determined from the Classification of the Significance of Effects in **Appendix 7-I**.

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Table 7-12
Description of Potential Effects and Significant Effects (Without Mitigation)

Potential Impact	Type of effect	Magnitude	Duration	Probability	Consequences	Impact Rating - Description of Effect (Without Mitigation)	Existing Environment Significance/ Sensitivity Rating	Significant Effects (Without Mitigation)	
Construction Stage - Surface Water									
1	Impact on surface water quality in the Anner River from suspended solids in site runoff	Direct adverse	High	Short term	Likely	Reduction in surface water quality of Anner River	Medium	High - Attribute has a high quality or value on a national scale primarily due to its designation.	Direct and Significant with increase in suspended solids in Anner River.
2	Impact on surface water quality in the Anner River from accidental spillage of hydrocarbons in runoff.	Direct adverse	High	Short term	Likely	Reduction in surface water quality of Anner River	Medium	High - Attribute has a high quality or value on a national scale primarily due to its designation.	Direct and Significant with hydrocarbons reaching the Anner River.
3	Impact on surface water quality in the Anner River from contaminated material in excavations.	Direct adverse	High	Short term	Likely	Reduction in surface water quality of Anner River	Medium	High - Attribute has a high quality or value on a national scale primarily due to its designation.	Direct and Significant with potential contaminants in runoff reaching the Anner River.
4	Impact on WFD Status of Anner River in terms of Quality and Quantity of water from abstraction and contaminated runoff.	Direct adverse	High	Short term	Likely	Reduction in WFD Status of Anner River	Medium	High - Attribute has a high quality or value on a national scale primarily due to its designation.	Direct and Significant with potential for reduction in WFD status of River.
5	Impact on Ecological designation of SAC from contaminated runoff	Indirect adverse	High	Short term	Likely	Reduction in ecological quality of SAC	Medium	High - Attribute has a high quality or value on a national scale primarily due to its designation.	Indirect and Significant with potential for reduction in ecological value of SAC.

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Potential Impact	Type of effect	Magnitude	Duration	Probability	Consequences	Impact Rating - Description of Effect (Without Mitigation)	Existing Environment Significance/ Sensitivity Rating	Significant Effects (Without Mitigation)	
Construction Stage - Groundwater									
6	Impact on groundwater quality in local boreholes (GSI) from accidental spillage of hydrocarbons	Direct adverse	Low	Short term	Unlikely	There are no GSI Boreholes downgradient of the site.	Negligible - Low	Medium to High - Attribute has a medium quality or value on a local scale as the groundwater is used as a supply.	Direct and Not Significant as magnitude is low, it is short term and considered unlikely to occur.
7	Impact on groundwater quality in industrial boreholes (Bulmers) from accidental spillage of hydrocarbons	Direct adverse	Low	Short term	Unlikely	Reduction in groundwater quality in industrial boreholes	Low	Medium to High - Attribute has a medium quality or value on a local scale as groundwater used for industrial supply	Direct and Not Significant as magnitude is low, it is short term and considered unlikely to occur.
8	Impact on groundwater of the locally important karstified aquifer from accidental spillage of hydrocarbons	Direct adverse	Low	Short term	Unlikely	Reduction in groundwater quality of the locally important karstified aquifer	Medium	Medium to High - Attribute has a high quality or value on a regional scale primarily because the regionally important and is used for water abstraction.	Direct and Not Significant as magnitude is low, it is short term and considered unlikely to occur.
9	Impact on WFD Status of groundwater body in terms of Quality of groundwater	Direct adverse	Low	Short term	Unlikely	Reduction in status of groundwater body	Medium	Medium to High - Attribute has a high quality or value on a regional scale primarily because the regionally important and is used for water abstraction.	Direct and Not Significant as magnitude is low, it is short term and considered unlikely to occur.

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Potential Impact	Type of effect	Magnitude	Duration	Probability	Consequences	Impact Rating - Description of Effect (Without Mitigation)	Existing Environment Significance/ Sensitivity Rating	Significant Effects (Without Mitigation)	
Operational Stage - Surface Water									
10	Impact on surface waters of Anner River from accidental fuel leaks from site traffic	Direct adverse	High	Long term	Likely	Reduction in surface water quality of Anner River	Medium	High - Attribute has a high quality or value on a national scale primarily due to its designation.	Direct and Significant with hydrocarbons reaching the Anner River.
11	Impact on WFD Status of Anner River in terms of Quality and Quantity of water from abstraction and contaminated runoff.	Direct adverse	High	Short term	Likely	Reduction in WFD Status of Anner River	Medium	High - Attribute has a high quality or value on a national scale primarily due to its designation.	Direct and Significant with potential for reduction in WFD status of River.
12	Impact on Ecological designation of SAC from contaminated runoff.	Indirect adverse	High	Short term	Likely	Reduction in ecological quality of SAC	Medium	High - Attribute has a high quality or value on a national scale primarily due to its designation.	Indirect and Significant with potential for reduction in ecological value of SAC.
Operational Stage - Groundwater									
13	Impact on groundwater quality in local boreholes (GSI) from accidental fuel spillage at the site	Direct adverse	Low	Long term	Unlikely	Reduction in groundwater quality in local boreholes	Negligible - Low	Medium to High - Attribute has a medium quality or value on a local scale as the groundwater is used as a supply.	Direct and Not Significant as magnitude is low, it is short term and considered unlikely to occur.
14	Impact on groundwater quality in industrial wells (Bulmers) from accidental fuel spillage at the site	Direct adverse	Low	Long term	Unlikely	Reduction in groundwater quality in industrial boreholes	Low	Medium to High - Attribute has a medium quality or value on a local scale as groundwater used for industrial supply	Direct and Not Significant as magnitude is low, it is short term and considered unlikely to occur.

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Potential Impact	Type of effect	Magnitude	Duration	Probability	Consequences	Impact Rating - Description of Effect (Without Mitigation)	Existing Environment Significance/ Sensitivity Rating	Significant Effects (Without Mitigation)
15 Impact on groundwater quality of the locally important karstified aquifer from accidental fuel spillage at the site	Direct adverse	High	Long term	Likely	Reduction in groundwater quality of the locally important karstified aquifer	Medium	Medium to High - Attribute has a high quality or value on a regional scale primarily because the regionally important and is used for water abstraction.	Direct and Not Significant as magnitude is low, it is short term and considered unlikely to occur.
The decommissioning stage effects will be the same as the Construction Stage Effects outlined in Items 1 -9 above in this table								

MITIGATION MEASURES

- 7.225 There are existing mitigation measures in place at the site to manage and treat storm surface water runoff and process water at the site. The existing measures are designed to protect surface water and groundwater at the site and in the receiving waters of the Anner River.
- 7.226 The existing mitigation measures will remain in place during the installation and operation of the proposed new boilers at the site.
- 7.227 The existing measures are designed to reduce the potential impacts associated with the operation of the site to acceptable levels, presenting a low risk to the receiving environment, are identified in this section. These measures are designed to either reduce the likelihood of an event occurring or the magnitude of the consequences should the event occur.
- 7.228 The existing measures, where they relate to surface water and groundwater are outlined above in this chapter and are summarised below. These measures will essentially be the operational stage measures once the development is complete at the site and include:
- Surface water treatment;
 - Fuel storage and refuelling;
 - Wastewater Treatment Plant to treat all wastewater generated on site;
 - Chemicals, oils and lubricants storage;
 - Plant and machinery inspections and maintenance programmes;
 - A spill kit is kept on-site to stop the migration of any accidental spillages, should they occur; and
 - The implementation of an Environmental Management System (EMS) at the site.

Construction Stage

- 7.229 The existing mitigation measures at the site will continue to be implemented through the water management and treatment systems as outlined within the baseline description section of this chapter.
- 7.230 In order to mitigate against the risk of pollution to groundwater and surface water occurring during construction stage at the site the following management measures will be implemented:
- If any contaminated soils / material is identified during excavations then the material will be set aside and bunding provided to ensure the material and water does not enter the site water management system, once the material has been tested and characterised and will be dealt with according to the results of the characterisation;
 - Any excavated soils, subsoils or C&D material will be managed to ensure that no suspended solids runoff and go into the site water management system;
 - no refuelling of plant or machinery will take place in the proposed development areas to prevent accidental leakage/spillages reaching surface water or groundwater at the site;
 - any extensive / non-routine maintenance of plant and machinery will take place on a hard stand area within the overall land holding to ensure no accidental spillages or leakages of oils or lubricants will reach the surface water or groundwater;

- all plant will be regularly maintained and inspected daily for leaks of fuels, lubricating oil or other contaminating liquids to reduce the chance of any leakages;
- a spill kit and drip trays will be kept on site and will be deployed if there is an accidental leak from any plant/machinery, to prevent any materials going to surface water or groundwater;
- no petroleum-based products (lubricating oils, waste oils, greases etc.) will be stored within the construction area at the site thereby eliminating any associated pollution risk arising from accidental leakages/spillages going to surface water or groundwater;
- plant operators will be briefed during 'toolbox' talks and site induction on where the spill kit is kept and how and when it should be deployed;
- a site construction traffic management system will be put in place to reduce the potential accidents between vehicles and the potential for fuel leaks/spills; and

7.231 These measures have and will continue to be implemented at the site to reduce the potential impacts identified and outlined above on surface water and groundwater.

Operational Stage

7.232 The existing mitigation measures in place at the site now, and outlined above, will be the mitigation measures once the development has been completed and is operational within the overall Medite site.

Post Operational Stage

7.233 A closure plan will be developed for the site which outlines how the site will be decommissioned in accordance with best practice and the best available techniques, at that time.

7.234 The water treatment system and mitigation measures outlined above for the Operational Stage will be maintained throughout the post operational decommissioning stage along with the construction stage measures outlined here, to ensure that there are no adverse impacts on surface water.

7.235 The last part of the post operational decommissioning stage will see the removal of the water management and treatment system to ensure that there are no adverse impacts on surface water or groundwater at the site.

RESIDUAL IMPACT ASSESSMENT

- 7.236 The potential impacts and the significance of effects have been identified for the sensitive receptors and are set out in Table 7-12 above; mitigation measures at the site during construction, operational and the decommissioning stages are set out above.
- 7.237 The residual impacts on the identified sensitive receptors with mitigation are set out in Table 7-13 below.
- 7.238 With the are the mitigation measures in place the residual impacts are reduced, and all identified potential impacts on the identified sensitive receptors are considered therefore to be Not Significant.

Table 7-13
Residual Impact - Significance of Effects with Mitigation

No.	Identified Potential Impact	Significant Effects - without mitigation	Significant Effects - with mitigation
<i>Construction Stage - Surface Water</i>			
1	Impact on surface water quality in the Anner River from suspended solids in site runoff	Direct and Significant with increase in suspended solids in Anner River.	Direct and Not Significant because measures will be put in place to prevent runoff from excavated materials from going to the site water management system.
2	Impact on surface water quality in the Anner River from accidental spillage of hydrocarbons in runoff.	Direct and Significant with hydrocarbons reaching the Anner River.	Direct and Not Significant because there will be no refuelling of plant / machinery in the development areas.
3	Impact on surface water quality in the Anner River from contaminated material in excavations.	Direct and Significant with potential contaminants in runoff reaching the Anner River.	Direct and Not Significant because measures will be put in place any suspected contaminated material in a designated area with bunding while it is tested and characterised ready for disposal.
4	Impact on WFD Status of Anner River in terms of Quality and Quantity of water from abstraction and contaminated runoff.	Direct and Significant with potential for reduction in WFD status of River.	Direct and Not Significant because there is no abstraction of water associated with the construction stage of the proposed development and the measures in No's 1 to 3 above also protect the surface water quality.

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No.	Identified Potential Impact	Significant Effects - without mitigation	Significant Effects - with mitigation
5	Impact on Ecological designation of SAC from contaminated runoff	Indirect and Significant with potential for reduction in ecological value of SAC.	Indirect and Not Significant because the measures in No's 1 to 4 above protect the surface water quality in the river.
<i>Construction Stage - Groundwater</i>			
6	Impact on groundwater quality in local boreholes (GSI) from accidental spillage of hydrocarbons	Direct and Not Significant as magnitude is low, it is short term and considered unlikely to occur.	Direct and Not Significant because there will be no refuelling of plant / machinery in the development areas and spill kits and drip trays will be used to manage any accidental spillages immediately.
7	Impact on groundwater quality in industrial boreholes (Bulmers) from accidental spillage of hydrocarbons	Direct and Not Significant as magnitude is low, it is short term and considered unlikely to occur.	Direct and Not Significant because there will be no refuelling of plant / machinery in the development areas and spill kits and drip trays will be used to manage any accidental spillages immediately.
8	Impact on groundwater of the locally important karstified aquifer from accidental spillage of hydrocarbons	Direct and Not Significant as magnitude is low, it is short term and considered unlikely to occur.	Direct and Not Significant because there will be no refuelling of plant / machinery in the development areas and spill kits and drip trays will be used to manage any accidental spillages immediately.
9	Impact on WFD Status of groundwater body in terms of Quality of groundwater	Direct and Not Significant as magnitude is low, it is short term and considered unlikely to occur.	Direct and Not Significant because with implementation of measures in No's 6 to 8 above.
<i>Operational Stage - Surface Water</i>			
10	Impact on surface waters of Anner River from accidental fuel leaks from site traffic	Direct and Significant with hydrocarbons reaching the Anner River.	Direct and Not Significant because traffic management measures will be implemented along with driver training to reduce the chance of collisions and accidental spillages. Spill kits will be on site to deal with any accidental spillages before the hydrocarbons reach the river.

No.	Identified Potential Impact	Significant Effects - without mitigation	Significant Effects - with mitigation
11	Impact on WFD Status of Anner River in terms of Quality and Quantity of water from abstraction and contaminated runoff.	Direct and Significant with potential for reduction in WFD status of River.	Direct and Not Significant because of the measures outlined above to protect surface water and groundwater quality and hence the WFD status.
12	Impact on Ecological designation of SAC from contaminated runoff.	Indirect and Significant with potential for reduction in ecological value of SAC.	Indirect and Not Significant because of the measures outlined above to protect surface water and groundwater quality and hence the WFD status.
Operational Stage - Groundwater			
13	Impact on groundwater quality in local boreholes (GSI) from accidental fuel spillage at the site	Direct and Not Significant as magnitude is low, it is short term and considered unlikely to occur.	Direct and Not Significant because there will be no refuelling of plant / machinery in the development areas and spill kits and drip trays will be used to manage any accidental spillages immediately. Also, the working areas will be largely sealed and there will be no infiltration of any hydrocarbons to the ground.
14	Impact on groundwater quality in industrial wells (Bulmers) from accidental fuel spillage at the site	Direct and Not Significant as magnitude is low, it is short term and considered unlikely to occur.	Direct and Not Significant because there will be no refuelling of plant / machinery in the development areas and spill kits and drip trays will be used to manage any accidental spillages immediately. Also, the working areas will be largely sealed and there will be no infiltration of any hydrocarbons to the ground.
15	Impact on groundwater quality of the locally important karstified aquifer from accidental fuel spillage at the site	Direct and Not Significant as magnitude is low, it is short term and considered unlikely to occur.	Direct and Not Significant because there will be no refuelling of plant / machinery in the development areas and spill kits and drip trays will be used to manage any accidental spillages immediately. Also, the working areas will be largely sealed and there will be no infiltration of any hydrocarbons to the ground.

7.239 Examination of the identified potential impacts on the receiving environment show that with the mitigation measures in place, there are no significant residual impacts with respect to groundwater and surface water during the construction / operational / post-operational stages of the Medite facility.

- 7.240 Based on the assessment undertaken here it is considered that with the indicated mitigation measures in place and properly implemented at the site, then the proposed development then the probability of Significant Effects is unlikely and the effects on surface water and groundwater as a result of the proposed development at the site will be reduced to Not Significant, see Table 7-13.
- 7.241 As the proposed site is located within the existing Medite permitted site and land holding and will be incorporated into the overall site water management system, it is not considered that the development will have a cumulative impact on water with the existing Medite operations.
- 7.242 Based on a review of the identified consented projects and proposed developments within 10 km of the site, and the fact that no significant effects have been identified in terms of water, then it is considered that there will be no cumulative effects associated with the proposed development and therefore there will be no significant effect on water arising.

MONITORING

7.243 There are monitoring programmes currently in place at the site as per the IE licence for both surface water and groundwater quality. These monitoring programmes are outlined below and will continue to be in place at the site in compliance with the licence requirements.

Surface Water

7.244 Surface Water Management and Treatment systems in place at the site will continue to be adhered to. All process and domestic water is passed through the on-site WWTP before being discharged from site at the Anner River.

7.245 Discharge monitoring under the facility's IE licence requirements will continue at the two discharge points, SW1 and SW2 on a quarterly basis. Water quality results for these two sampling points are screened against the limits set out in the licence and the results are reported to the EPA.

7.246 While Surface water quality monitoring in the Anner River is not specifically required under the EPA IPC licence, monitoring of the background surface water quality in the river upstream of the site and the water quality in the river downstream of the site discharge and site will be undertaken on a quarterly for Medite's own records. This background baseline monitoring in the river is considered to be best practice and will indicate if the facility and discharge is impacting on the receiving surface water quality.

Groundwater

7.247 Groundwater monitoring under the conditions of the facility's IE licence will continue on a quarterly basis at all monitoring wells (AGW1 - AGW10). Annual groundwater monitoring reports are produced based on this monitoring and will continue to be submitted to the EPA.

7.248 The parameters included in the groundwater monitoring programme are those set out in Schedule 4(ii) of the EPA IE licence. These parameters are:

- pH;
- Trace organics (as per USEPA Method 524.4);
- Major anions;
- Major cations;
- Individual heavy metals;
- Ammonia.

7.249 The water levels in all monitoring wells will continue to be monitored on a quarterly basis to confirm the direction/variability of groundwater flow beneath the site.

FIGURES

Figure 7-1 Site Location and Surface Water Features

Figure 7-2 Site Monitoring Locations

Figure 7-3 Bedrock Aquifer (1:25,000)

Figure 7-4 Groundwater Bodies (1:25,000)

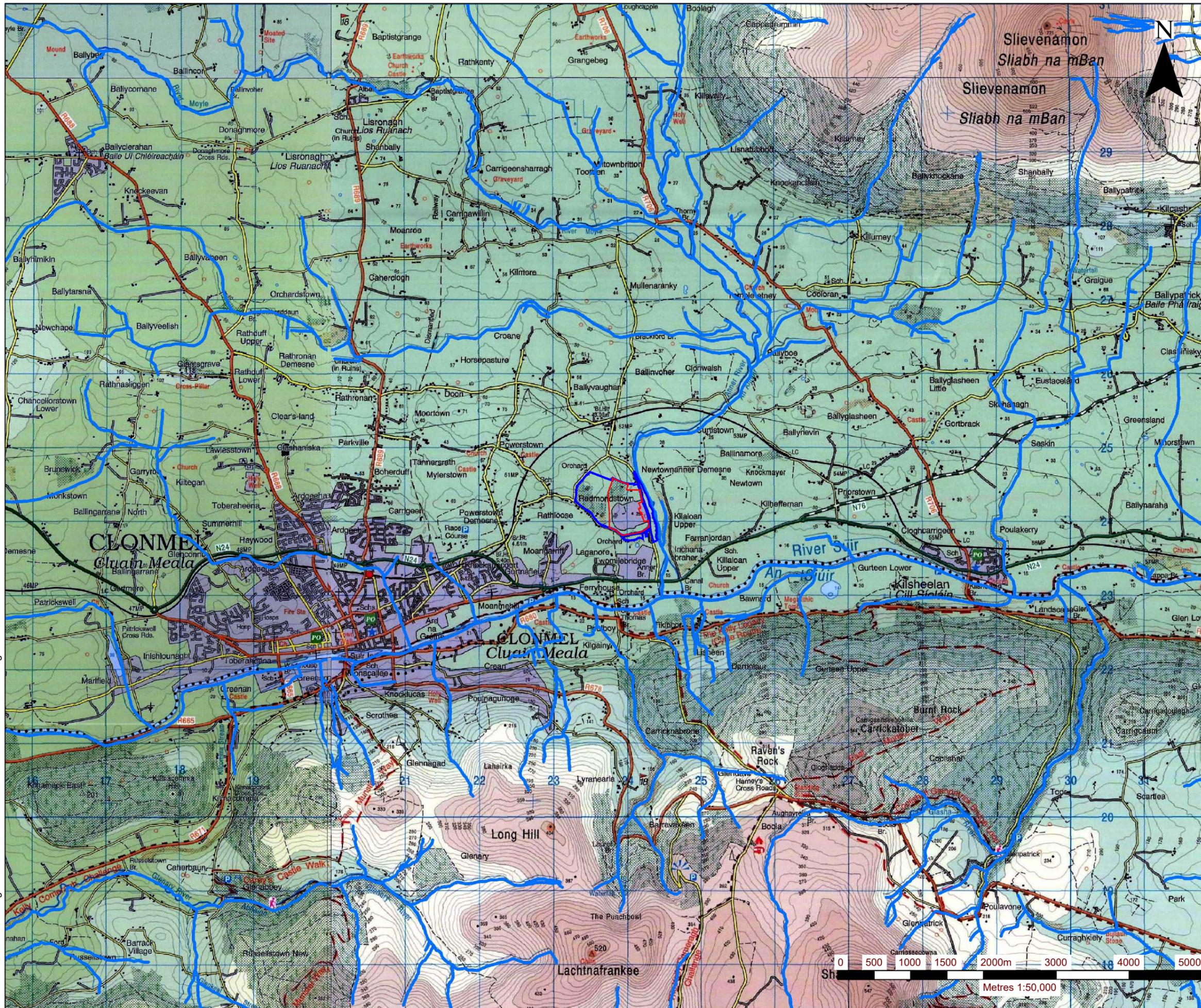
Figure 7-5 Groundwater Vulnerability (1:25,000)

Figure 7-6 GSI Source Protection Areas (1:25,000)

Figure 7-7 Local Production Wells - Bulmers (1:5,000)

Figure 7-8 Proposed Site Layout with Development Areas and Impermeable Surfaces

ABP-311901-21.EIAR Fig7-1.0.Site Location and Surface Water Features.dwg



NOTES
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LEGEND

-  MEDITE LANDOWNERSHIP BOUNDARY
-  PLANNING APPLICATION AREA (C. 29.0 HA)
-  RIVER WATERBODIES

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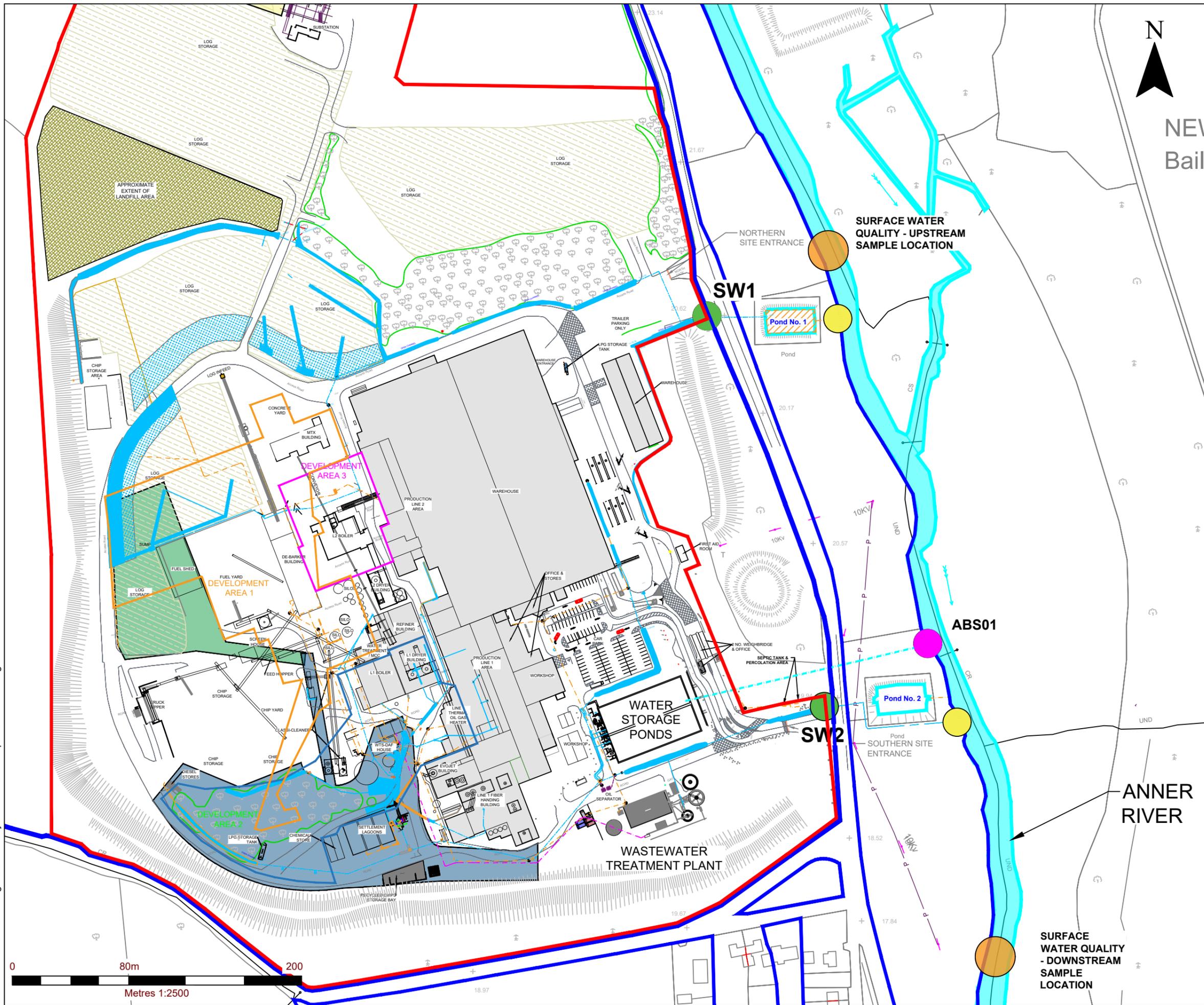
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 ENVIRONMENTAL IMPACT ASSESSMENT REPORT
 PROPOSED ENERGY PROJECT
 AT THE MEDITE FACILITY,
 REDMONDSTOWN, CLONMEL, CO. TIPPERARY
SURFACE WATER FEATURES

FIGURE 7-1

Scale: 1:50,000 @ A3
 Date: DECEMBER 2023

ABP-311991-21.EIAR Fig 7-2.0 Site Layout WATER Sample Locations.dwg



NOTES

1. BASED ON 1:2,500 OSI MAPPING - MAP NO. 5369D, 5390C, 5430B, 5431A
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LEGEND

- MEDITE LAND INTEREST
- PLANNING APPLICATION AREA (C. 29.7 HA)
- RIVER ANNER
- WAYLEAVE
- MEDITE DISCHARGE MONITORING POINTS
- ABSTRACTION POINT
- DISCHARGE POINTS TO ANNER RIVER
- SURFACE WATER QUALITY MONITORING POINT ON ANNER RIVER
- BOREHOLD LOCATIONS
- DRAINAGE LINES TO DISCHARGE POINTS
- SURFACE WATER RUN-OFF DRAINS
- SLUDGE RETURNS
- ABSTRACTION LINE TO WATER STORAGE PONDS
- DEVELOPMENT AREA 1
- DEVELOPMENT AREA 2
- DEVELOPMENT AREA 3

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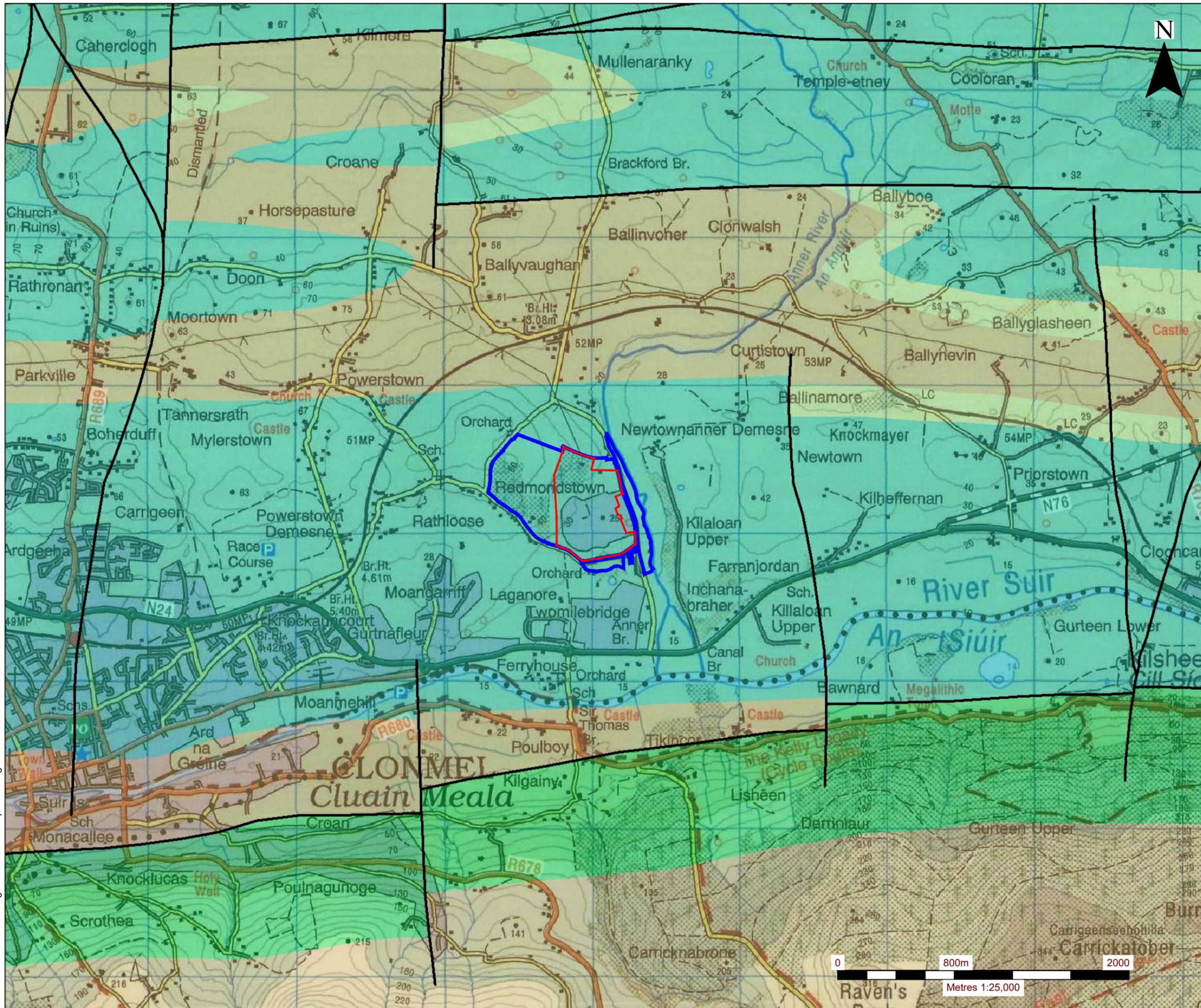
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 ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

**PROPOSED ENERGY PROJECT
 AT THE MEDITE FACILITY,
 CLONMEL, Co. TIPPERARY**

SITE MONITORING LOCATIONS

FIGURE 7-2

Scale 1:2,500 @ A3 Date DECEMBER 2023



NOTES
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LEGEND

	MEDITE LANDOWNERSHIP BOUNDARY
	PLANNING APPLICATION AREA (C. 29.7 HA)
	Rkd - REGIONALLY IMPORTANT AQUIFER - KARSTIFIED (DIFFUSE)
	Rf - REGIONALLY IMPORTANT AQUIFER - FISSURED BEDROCK
	Lm - LOCALLY IMPORTANT AQUIFER - BEDROCK WHICH IS GENERALLY MODERATELY PRODUCTIVE
	LI - LOCALLY IMPORTANT AQUIFER - BEDROCK WHICH IS MODERATELY PRODUCTIVE ONLY IN LOCAL ZONES
	PI - POOR AQUIFER - BEDROCK WHICH IS GENERALLY UNPRODUCTIVE EXCEPT IN LOCAL ZONES
	GEOLOGICAL FAULT

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 AT THE MEDITE FACILITY,
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BEDROCK AQUIFER

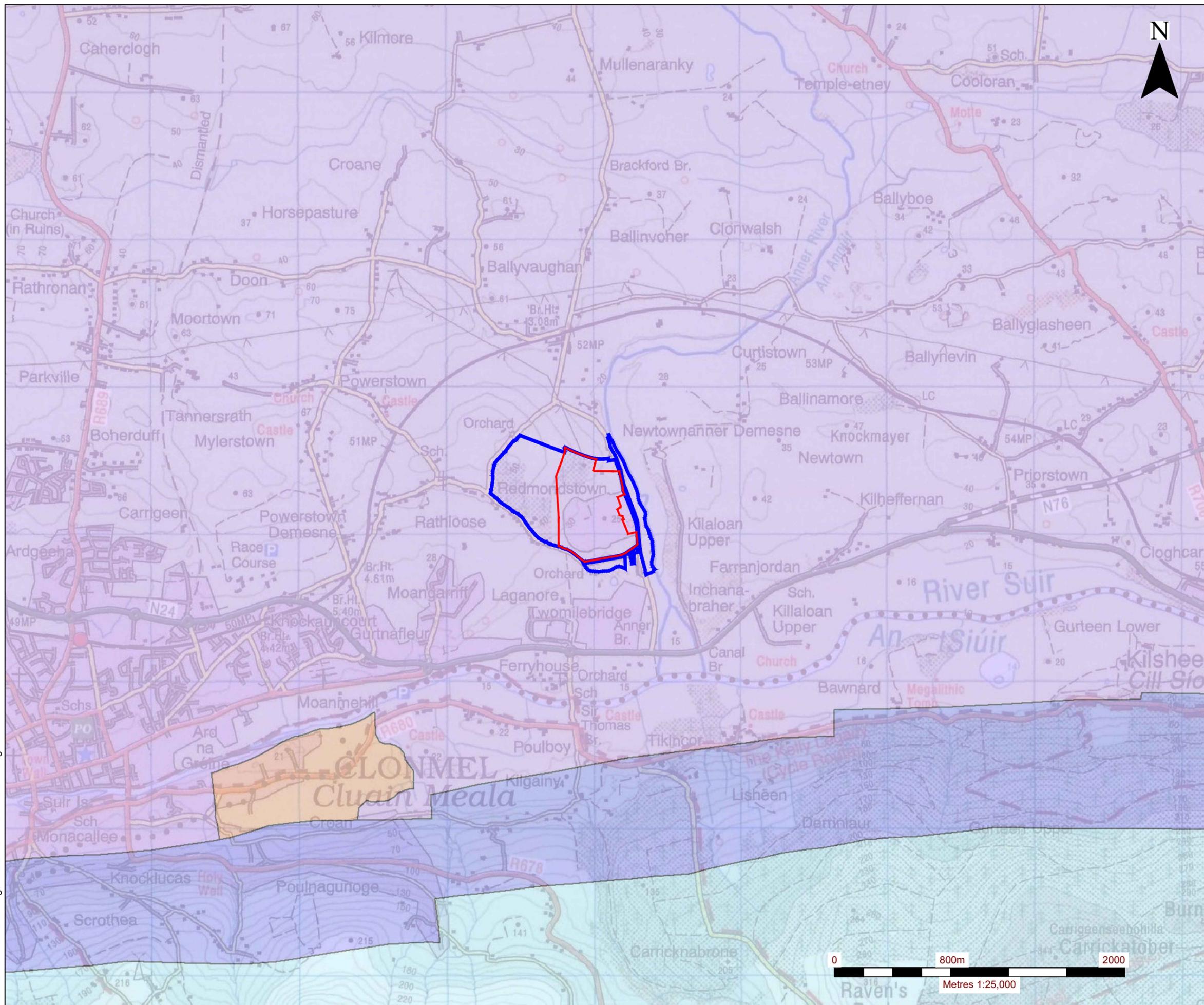
FIGURE 7-3

Scale 1:25,000 @ A3 Date DECEMBER 2023



ABP-311991-21.EIAR Fig7-3.0.Bedrock Aquifers.dwg

ABP-311991-21.EIAR Fig7-4.0.Groundwater bodies.dwg



NOTES
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LEGEND

	MEDITE LANDOWNERSHIP BOUNDARY
	PLANNING APPLICATION AREA (C. 29.7 HA)
	CLONMEL
	CARRICK-ON-SUIR
	COMERAGH
	INDUSTRIAL FACILITY (P0225-01)



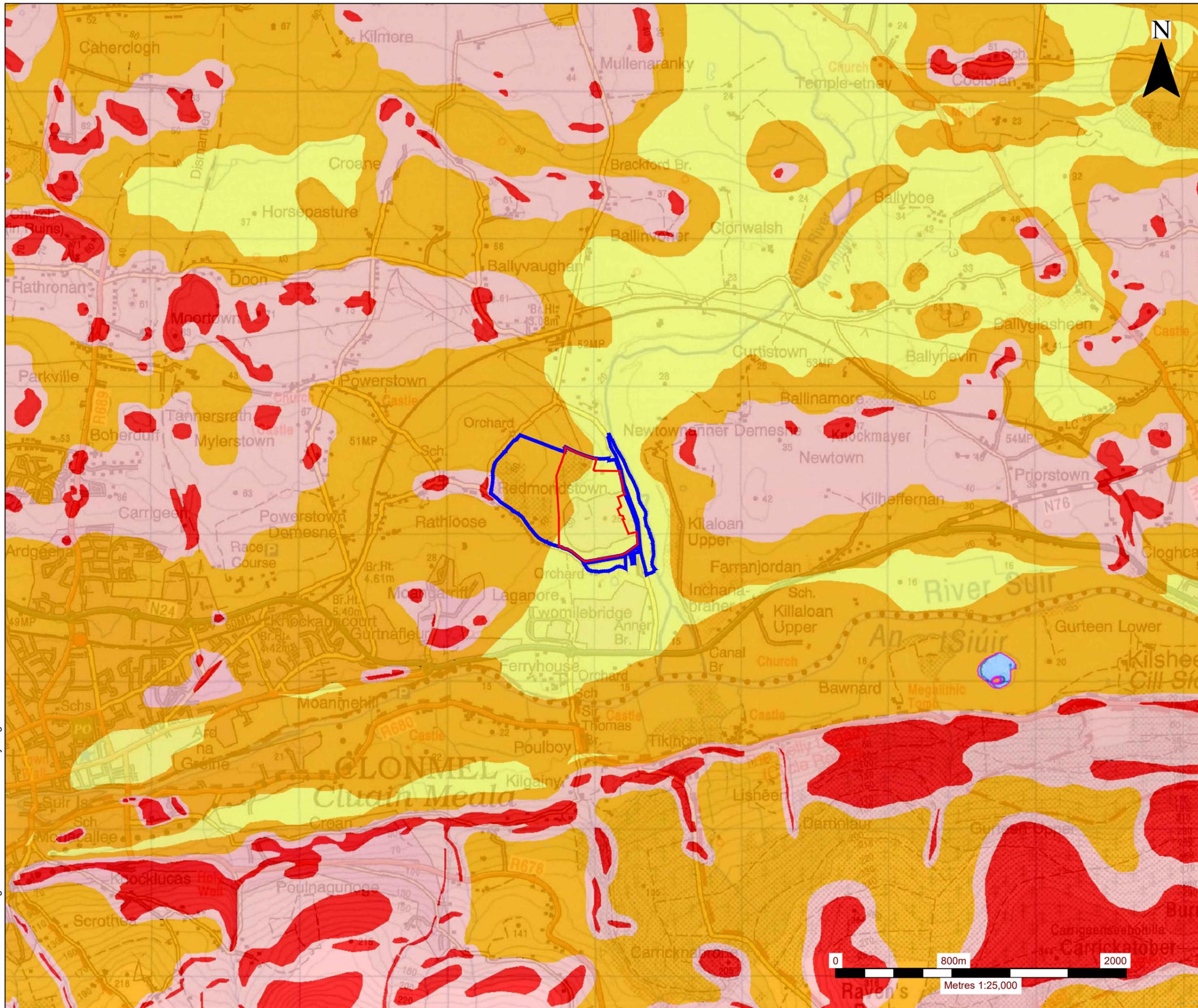
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GROUNDWATER BODIES

FIGURE 7-4

Scale 1:25,000 @ A3 Date DECEMBER 2023



NOTES
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LEGEND

-  MEDITE LANDOWNERSHIP BOUNDARY
-  PLANNING APPLICATION AREA (C. 29.7 HA)
-  ROCK AT OR NEAR SURFACE OR KARST
-  EXTREME
-  HIGH
-  MODERATE
-  LOW



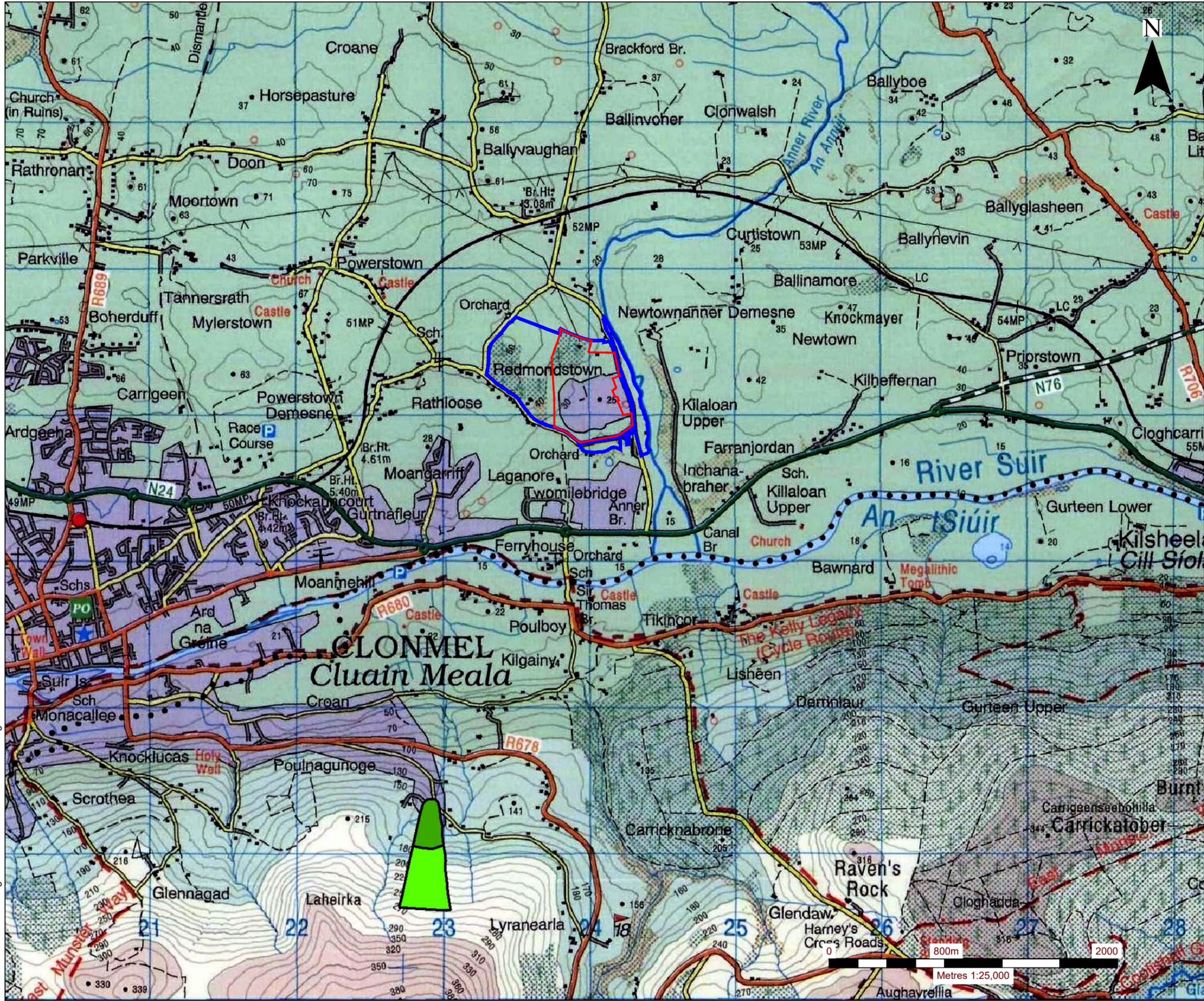
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GROUNDWATER VULNERABILITY

FIGURE 7-5

Scale 1:25,000 @ A3 Date DECEMBER 2023



NOTES
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LEGEND

-  MEDITE LANDOWNERSHIP BOUNDARY
-  PLANNING APPLICATION AREA (C. 29.7 HA)
-  SI - INNER PROTECTION AREA
-  SO - OUTER PROTECTION AREA

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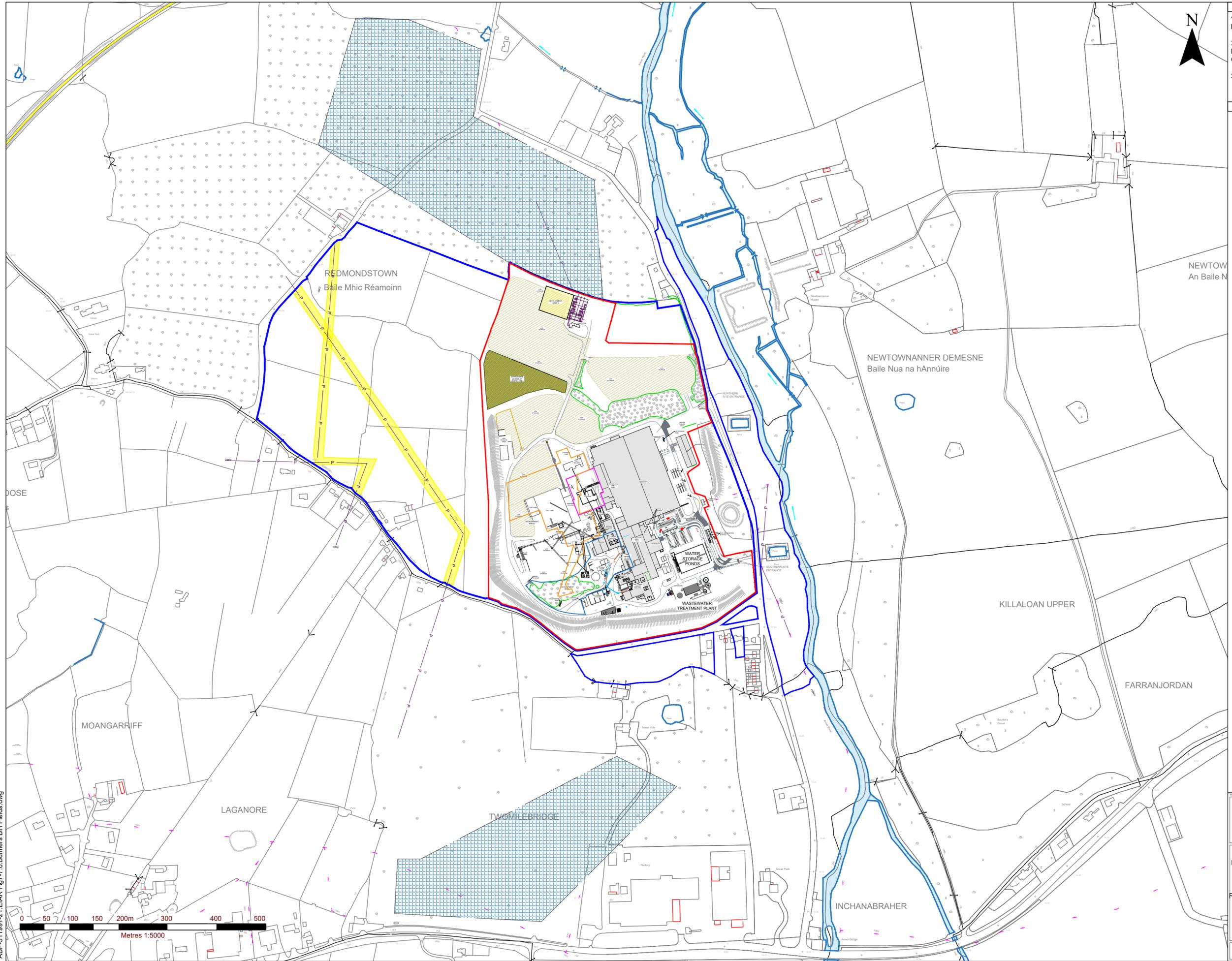
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 SOURCE PROTECTION AREA

FIGURE 7-6

Scale 1:25,000 @ A3 Date DECEMBER 2023

ABP-311991-21.EIAR Fig7-6.0.Source Protection Areas.dwg



NOTES

1. BASED ON 1:2,500 OSI MAPPING - MAP NO. 5369D, 5390C, 5430B, 5431A
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LEGEND

	MEDITE LAND INTEREST
	PLANNING APPLICATION AREA (C. 29.7 HA)
	RIVER ANNER
	WAYLEAVE
	BULMERS BOREHOLE SUPPLY FIELDS - APPROXIMATE EXTENT OF BOREHOLE LOCATIONS

ABP-311991-21 EIA R Fig 7-7.0 Bulmers BH Fields.dwg

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BULMERS BOREHOLE FIELDS

FIGURE 7-7
 Scale 1:5,000 @ A3 Date DECEMBER 2023

APPENDIX

Appendix 7-A EU Directives/ National legislation and Regulations/ Guidelines/ Technical Standards

Appendix 7-B Site Wastewater Treatment Process

Appendix 7-C Site Risk Management Report - Firewater Report and Potential Spillages

Appendix 7-D Hydrocarbon Separator Details

Appendix 7-E Site Discharge and Surface Water Quality Results

Appendix 7-F Groundwater Body Initial Characterisation

Appendix 7-G Rating of Existing Environment Significance/ Sensitivity (based on IGI, 2013 guidelines)

Appendix 7-H Descriptions of Effects, after Table 3.4 (EPA, 2022)

Appendix 7-I Classification of the Significance of Impacts, after Figure 3.4 (EPA, 2022)

(Refer to EIAR Volume 3 for Appendices)